National Defence / Défense nationale

A-CR-CCP-804/PF-001

ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR INSTRUCTIONAL GUIDES

(ENGLISH)

(Supersedes A-CR-CCP-804/PF-001 dated 2009-06-01)

Cette publication est disponible en français sous le numéro A-CR-CCP-804/PF-002.

Issued on Authority of the Chief of the Defence Staff

Canada

National Défense
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OPI: D Cdts & JCR 4 – Senior Staff Officer Youth Programs Development

2015-09-01

Canada

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Contact Officer: D Cdts & JCR 4-7-4 – Air Cadet Program Development Staff Officer

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FOREWORD AND PREFACE

1. **Issuing Authority.** This Instructional Guide (IG) A-CR-CCP-804/PF-001 was developed under the authority of the Director Cadets and Junior Canadian Rangers, and issued on the authority of the Chief of Defence Staff.

2. **Development.** Development of this IG was in accordance with the performance oriented concept of training outlined in the A-P9-050 Series, *Canadian Forces Individual Training and Education System*, with modifications to meet the needs of the Canadian Cadet Organization.

3. **Purpose of the IG.** The IG is to be used by Royal Canadian Air Cadet Squadrons in conjunction with other resources to conduct the Proficiency Level Four Program. The IG provides instructors with the base means from which to deliver training. Individual IGs are to be reviewed in conjunction with the Lesson Specifications (LSs) found in Chapter 4 of A-CR-CCP-804/PG-001, *Royal Canadian Air Cadet Proficiency Level Four Qualification Standard and Plan*, before instructing, so that each instructor can adequately plan for and prepare each lesson. Instructors may be required to develop instructional materials to support training in addition to any that may be provided, eg, posters, videos, handouts, models, etc, supplemental to training control and support documents. Suggested instructional activities are included in most IGs to maximize learning and fun. Instructors are also encouraged to modify and / or enhance the activities, as long as they continue to contribute to enabling objective achievement.

4. **Use of the IG.** Throughout these instructional guides, a series of information boxes are used to highlight information; they include:

Note to the Instructor.

Key information to pass along to cadets.

Refer to the following CF regulations and policies.

Points of interest or special instructions the instructor should pass along to cadets.

5. **Suggested Changes.** Suggested changes to this document may be sent directly to cadettraining@canada.ca.

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

POSITIVE SOCIAL RELATIONS FOR YOUTH

SECTION 1

PO 400 – PARTICIPATE IN POSITIVE SOCIAL RELATIONS FOR YOUTH TRAINING

Total Time:

The instructional guides for this PO are located in A-CR-CCP-915/PG-001, Positive Social Relations for Youth Training Facilitator's Package.

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COMMON TRAINING

ALL TRAINING LEVELS

INSTRUCTIONAL GUIDE

CITIZENSHIP

POSITIVE SOCIAL RELATIONS FOR YOUTH

SECTION 1

PO X01 – PARTICIPATE IN CITIZENSHIP ACTIVITIES

Total Time:

For the following EOs, refer to the lesson specifications located in A-CR-CCP-701/PG-001, *Royal Canadian Army Cadets Green Star Qualification Standard and Plan*::

- MX01.01A – Participate in a Citizenship Tour,
- MX01.01B – Attend a Presentation by a Community Organization,
- MX01.01C – Attend a Presentation by a Citizen-of-Interest,
- MX01.01D – Participate in the Canadian Citizenship Challenge,
- MX01.01E – Host a Citizenship Ceremony, and
- CX01.01 – Participate in Citizenship Activities.

For the following EOs, refer to the instructional guides located in A-CR-CCP-701/PF-001, *Canadian Army Cadets Green Star Instructional Guides*:

- MX01.01F – Participate in an Election,
- MX01.01G – Participate in Heritage Minutes Video Activities, and
- MX01.01H – Participate in Citizenship Learning Stations.

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COMMON TRAINING

ALL TRAINING LEVELS

INSTRUCTIONAL GUIDE

COMMUNITY SERVICE

SECTION 1

PO X02 – PERFORM COMMUNITY SERVICE

Total Time:

For the following EOs, refer to the instructional guides located in A-CR-CCP-801/PF-001, *Royal Canadian Air Cadets Proficiency Level One Instructional Guides*:

- MX02.01 – Perform Community Service, and
- CX02.01 – Perform Community Service.

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 1

EO M403.01 – DESCRIBE NEEDS AND EXPECTATIONS OF TEAM MEMBERS

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy the Needs and Expectations of Team Members handout located at Attachment A for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TP 1 to orient the cadets to team members' needs.

An in-class activity was chosen for TP 2 as it is an interactive way to provoke thought and stimulate interest among cadets about expectations that a team member has of a team leader.

A group discussion was chosen for TP 3 as it allows the cadets to interact with their peers and share their knowledge, experiences, opinions and feelings about how a team leader should strive to meet team members needs and expectations.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to describe the needs and expectations of team members.

IMPORTANCE

It is important for cadets to describe the needs and expectations of team members to assist in the development of their leadership skills. This information aids the cadets in meeting the aim of developing in youth the attributes of good leadership stated in CATO 11-03, *Cadet Program Mandate*. To become an effective team leader, the cadet must be aware of needs and expectations, and strive to satisfy those needs and expectations.

Teaching Point 1 **Describe the needs of team members.**

Time: 5 min Method: Interactive Lecture

THE NEEDS OF TEAM MEMBERS

To be an effective leader, a team leader must be aware that every team member has needs to be satisfied.

Acceptance of and by Other Team Members

Each team member needs to accept the other members of the team. There may be differences in age, gender, race and opinion but each team member should appreciate all other members. In turn, each team member needs to feel accepted by other team members. Once team members feel acknowledged and understood by others on the team, team members may strive to make teamwork possible. Once the team forms into a cohesive group, the accomplishment of a task becomes easier.

Acceptance and Understanding of Leaders

Team members need to know that the team leader will welcome them into the team. It is important for a team leader to encourage a sense of belonging in each team member. Team members also need the team leader to show compassion and sensitivity to their opinions and feelings.

Approval of Leaders

Team members need to know that the team leader appreciates them and their contribution. It is important for team leaders to show respect and praise team members.

Opportunities to Try Different Tasks and Roles

Team members need opportunities to attempt different tasks and roles to practice applying skills and knowledge.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What are the needs of team members?

Q2. Once team members feel acknowledged and understood by others on the team, what may happen?

Q3. How do team leaders show approval of team members?

ANTICIPATED ANSWERS:

A1. The needs of team members are:

- acceptance of and by other team members;
- acceptance and understanding of leaders;
- approval of leaders; and
- opportunities to try different tasks and roles.

A2. Once team members feel acknowledged and understood by others on the team, team members strive to make teamwork possible.

A3. Team leaders show approval of team members by giving team members respect and praise.

Teaching Point 2 **Conduct an activity where cadets describe the expectations that a team member has of a team leader.**

Time: 10 min Method: In-Class Activity

BACKGROUND KNOWLEDGE

The purpose of the in-class activity is to draw the following information from the three groups.

THE EXPECTATIONS THAT A TEAM MEMBER HAS OF A TEAM LEADER

Every team member has expectations of the team leader. Team members hope that the team leader will fulfill their expectations. Team member expectations include:

Good Leadership

Team members expect good leadership from team leaders. Team leaders need to display good leadership, to include:

- **Leading by example.** Team members expect that what they are asked to do can also be done by the team leader. They expect the team leader will model the correct behaviour.
- **Putting the needs of the team members first.** The team leader is expected to put the team's needs ahead of their own. Team members need to know that the team leader will accept, approve and understand them. Team members also expect that the team leader will give them opportunities to try different tasks and roles.
- **Being sensitive to cultural and gender differences.** Each team member is unique and the team leader must have an awareness of the differences between each of them. Having an understanding of cultural and gender differences between members of the team will allow the team members to feel included and appreciated.

Effective Communication

Team members expect that the team leader will provide them with effective communication. Team leaders need to display effective communication to team members, to include:

- **Giving information on what is expected of them.** Team members need to know what is expected of them. Team members require basic information about what they are to accomplish.
- **Explaining changes in situations.** Team members like to know when changes in situations occur. Keeping team members informed of changes and providing new directions may ensure that goals and tasks are accomplished.
- **Asking for assistance with tasks.** Team members are more cooperative when they are asked for assistance by the team leader rather than being ordered to do something. By asking for the team's assistance, team members may feel needed by their team leader.
- **Providing concrete examples during explanations.** Team members may understand concepts and ideas more easily if the team leader uses examples from life and if the team leader can connect the concept or idea to what the team member already knows.

Effective Supervision

Team members expect that the team leader will provide them with effective supervision. Team leaders need to effectively supervise team members, to include:

- **Operating in a safe environment.** Team members expect to be operating in a safe environment. Every team leader must be concerned with the team's safety and well-being at all times.
- **Freedom from over-supervision.** Team members should feel like their team leader has confidence in them to accomplish tasks. Very few team members appreciate it when the team leader is always looking over their shoulder.
- **Recognition of good performance.** Team members like to be praised when things go well. Praise may be verbal or may take the form of certificates and awards.

ACTIVITY

Time: 10 min

OBJECTIVE

The objective of this activity is to have the cadets describe the expectations that a team member has of a team leader.

RESOURCES

- Three flip charts, and
- Three markers.

ACTIVITY LAYOUT

Set a flip chart in three corners of the room.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into three groups.
2. Assign each group to a flip chart.
3. Have each group write one of the headings on the flip chart: Good Leadership, Effective Communication, and Effective Supervision.
4. Have the cadets brainstorm short descriptions for the heading on the flip chart paper for three minutes and write their ideas on the flip chart paper.
5. Have one cadet from each group present their ideas to the rest of the cadets.

Any of the background information that was missed during the presentation by cadets must be stated before moving to the next TP.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 2

The cadets' participation in the activity will serve as the confirmation for this TP.

Teaching Point 3 **Conduct a group discussion on how a team leader should strive to meet the needs and expectations of team members.**

Time: 10 min Method: Group Discussion

If the class of Proficiency Level Four cadets is large, divide them into groups.

This teaching point has been designed to provide the cadets an opportunity to reflect on and share their opinions and feelings about how a team leader should strive to meet team member's needs and expectations.

BACKGROUND KNOWLEDGE

The purpose of the group discussion is to draw information from the group using the tips for answering / facilitating discussion and the suggested questions provided.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. Give examples of when you have seen a team leader satisfy the needs of their team members.

Q2. List ways a team leader might satisfy the needs of their team members.

Q3. Give examples of when you have seen a team leader meet the expectations of team members.

Q4. List ways a team leader might meet the expectations of their team.

Q5. Give examples of when you have seen a team leader not satisfy the needs or not meet the expectations of their team.

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

CONFIRMATION OF TEACHING POINT 3

The cadets' participation in the group discussion will serve as confirmation of this TP.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. What are the needs of team members?

Q2. What are the three expectations that team members have of the team leader?

Q3. List ways a team leader might satisfy the needs or meet the expectations of their team members.

ANTICIPATED ANSWERS:

A1. The needs of team members are:

- acceptance of and by other team members;
- acceptance and understanding of leaders;
- approval of leaders; and
- opportunities to try different tasks and roles.

A2. The three expectations that team members have of the team leader are:

- good leadership,
- effective communication, and
- effective supervision.

A3. Answers will vary.

Distribute the Needs and Expectations of Team Members handout located at Attachment A to each cadet.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, 403 PC.

CLOSING STATEMENT

To be an effective leader, team leaders must satisfy the needs and meet the expectations of team members. Having an awareness of those needs and expectations will assist the team leader in doing so.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

A0-047 A-PA-005-000/AP-004 Canadian Defence Academy–Canadian Forces Leadership Institute. (2005). *Leadership in the CF conceptual foundations*. Ottawa, ON: Department of National Defence.

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A0-131 A-CR-CCP-910/PT-001 Director Cadets 6. (1989). *Training school leadership*. Ottawa, ON: Department of National Defence.

C0-115 ISBN 0-7879-4059-3 van Linden, J. A., & Fertman, C. I. (1998). *Youth leadership*. San Francisco, CA: Jossey-Bass Inc., Publishers.

NEEDS AND EXPECTATIONS OF TEAM MEMBERS

THE NEEDS OF TEAM MEMBERS

To be an effective leader, a team leader must be aware that every team member has needs to be satisfied.

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THE EXPECTATIONS THAT A TEAM MEMBER HAS OF A TEAM LEADER

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- **Leading by example.** Team members expect that what they are asked to do can also be done by the team leader. They expect the team leader will model the correct behaviour.
- **Putting the needs of the team members first.** The team leader is expected to put the team's needs ahead of their own. Team members need to know that the team leader will accept, approve and understand them. Team members also expect that the team leader will give them opportunities to try different tasks and roles.
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- **Recognition of good performance.** Team members like to be praised when things go well. Praise may be verbal or may take the form of certificates and awards.

COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 2

EO M403.02 – SELECT A LEADERSHIP APPROACH

Total Time: 60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy the handouts located at Attachments A, B and D for each cadet.

Photocopy the scenarios located at Attachment C. Cut out a scenario for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TPs 1, 2 and 3 to review, clarify, emphasize and summarize transactional and transformational leadership, the outcomes of a team leader's focus and leadership approaches.

An in-class activity was chosen for TP 4 as it is an interactive way to provoke thought and stimulate interest among cadets.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have selected a leadership approach.

IMPORTANCE

It is important for cadets to select a leadership approach in order to help them become effective team leaders during a leadership appointment. For every leadership opportunity, an effective leader will use a leadership approach that enables the team members to accomplish the goal.

Teaching Point 1 **Describe transactional and transformational leadership.**

Time: 5 min Method: Interactive Lecture

TRANSACTIONAL AND TRANSFORMATIONAL LEADERSHIP

Transactional leadership. Leaders exchange promises of rewards and benefits to team members so the team members will fulfill agreements with the leaders. This type of leadership is task-oriented. The leader sets the rules and procedures to complete a task and the team members comply with the rules and follow the procedures to accomplish the task.

Transactional Leadership:

- Values problem and solution identification.
- Makes decisions – even if everyone has not been heard – in order to move forward.
- Uses standards and principles as guides in decision making.
- Develops the self to be a better decision maker for the group.
- Gets things done.
- Recognizes the importance of the product.
- Takes charge (personal power).

Transformational leadership. Focuses on the process of being a leader by helping team members transform themselves from followers into leaders. Transformational leadership involves assisting team members to transcend their own self-interest for the good of the group, organization or society; to consider their long-term needs to develop themselves, rather than their immediate needs; and generally, to become more aware of what is really important.

Transformational Leadership:

- Values the participation and contribution of others.
- Takes all viewpoints and advice into account before making a decision.
- Considers individuals within their contexts and situations.
- Uses individuals to test decisions.
- Develops the self first to be a better contributor to the group.
- Learns from experiences to generalize to ‘real life’.
- Recognizes the importance of the process.
- Shares leadership (group power).

Leadership within the cadet program has been designed to create transformational leadership. Transformational leadership enables the Cadet Program to meet its first aim—to develop in youth the attributes of good citizenship and leadership.

Transactional leadership focuses on the skills and tasks associated with leadership, such as public speaking, writing, delegating authority, leading meetings and making decisions. It is what people who are leaders do.

Transformational leadership focuses on the process of leadership and what it means to be a leader. It is concerned with how individuals use their abilities to influence people. Think of the main difference between transactional and transformational leadership as doing leadership tasks versus being a leader.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. Describe transactional leadership.

Q2. On what does transformational leadership focus?

Q3. Leadership within the cadet program has been designed to create which kind of leadership?

ANTICIPATED ANSWERS:

A1. Transactional leadership is when leaders exchange promises of rewards and benefits to team members so the team members will fulfill agreements with the leaders.

A2. Transformational leadership focuses on the process of being a leader by helping team members transform themselves from followers into leader.

A3. Leadership within the cadet program has been designed to create transformational leadership.

Teaching Point 2 **Describe the outcomes that occur as a result of the team leader focussing on team members and the goal.**

Time: 10 min Method: Interactive Lecture

Distribute Attachment A to each cadet.

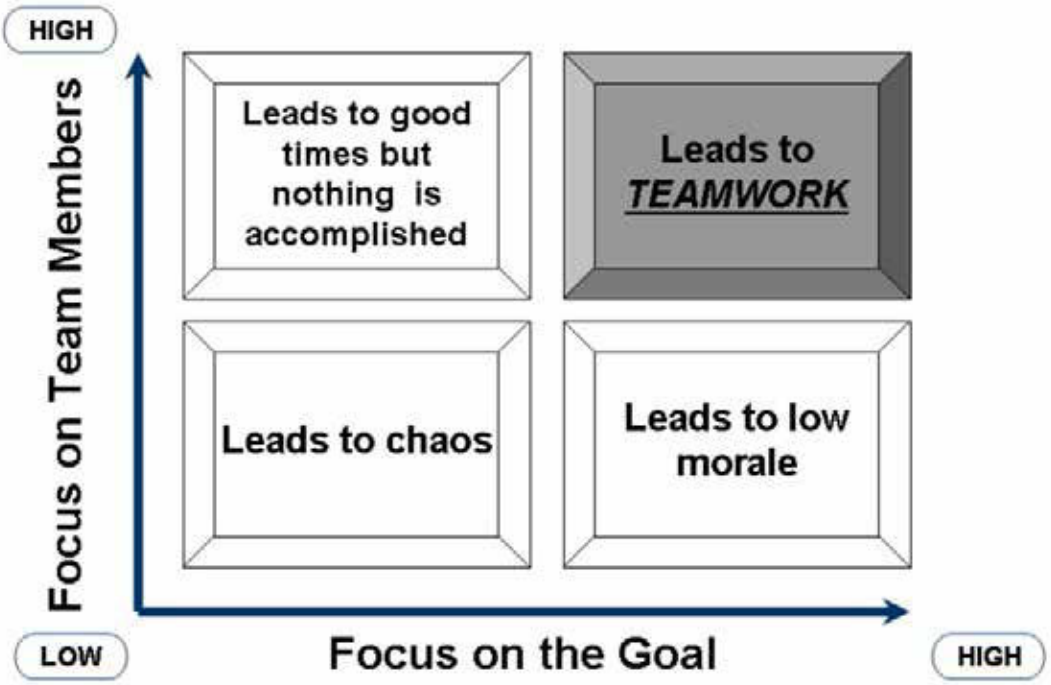

Figure 1 Outcomes as a Result of the Team Leader's Focus

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

There are two main things on which to focus while leading a team: the team members and the goal.

If a team leader is not focused on the goal and is not focused on their team members, the outcome is usually chaos.

Ask cadets why they think chaos would occur. Ask cadets to provide one or two examples, from a leadership perspective, when they have seen such chaos occur. The examples do not necessarily need to involve the Cadet Program (CP).

If a team leader is not concerned with the goal but is highly concerned about how their team members feel, the outcome may lead to good times but nothing gets accomplished.

Ask cadets why they think the result of good times but nothing gets accomplished may occur. Ask cadets to provide one or two examples, from a leadership perspective, when they have seen good times occur but nothing gets accomplished. The examples do not necessarily need to involve the CP.

If a team leader is highly concerned with the goal but not concerned about how their team member's feel, the outcome may lead to low morale.

Ask cadets why they think low morale would occur. Ask cadets to provide one or two examples, from a leadership perspective, of when they have seen low morale occur. The examples do not necessarily need to involve the CP.

If a team leader is highly concerned with the goal and highly concerned about how their team members feel, the outcome is usually teamwork.

Ask cadets why they think teamwork would occur. Ask cadets to provide one or two examples, from a leadership perspective, when they have seen teamwork occur. The examples do not necessarily need to involve the CP.

Every leadership opportunity within the cadet program has been designed to create teamwork.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What are the two main things on which a team leader needs to focus while leading a team?

Q2. If a team leader is not focused on the goal and is not focused on their team members, what is usually the outcome?

Q3. What has every leadership opportunity within the CP has been designed to create?

ANTICIPATED ANSWERS:

A1. The team leader needs to focus on the team members and on the goal.

A2. If a team leader is not focused on the goal and is not focused on their team members, the outcome is usually chaos.

A3. Every leadership opportunity within the CP has been designed to create teamwork.

Teaching Point 3 **Describe leadership approaches.**

Time: 15 min Method: Interactive Lecture

LEADERSHIP APPROACHES

There are three main leadership approaches in the CP. They are:

- control,
- coach and
- empower.

Each leadership approach is based on balancing the concern for the relationship with team members for the concern for accomplishing the task.

Distribute Attachment B to each cadet.

Key Aspects of the Control Approach

Key aspects of the control approach are:

- The team leader defines the roles and tasks for the team members. The team leader gives the team members clear direction and supervises them closely.
- The team leader provides detailed explanations on what needs to be done and gives team members the information they need to know on how to do the task.
- Communication is mainly one-way.

Key Aspects of the Coach Approach

Key aspects of the coach approach are:

- The roles and tasks are still defined by the team leader but ideas and suggestions are solicited from team members.
- The team leader provides information and opinions but supports the team to develop possible solutions to problems while the final decision remains with the team leader.
- The team leader encourages team members to assume responsibility.
- Communication is mainly two-way.

Key Aspects of the Empower Approach

Key aspects of the empower approach are:

- The team leader empowers team members to make decisions and take action in areas where the team members have experience and expertise.
- Team members can operate independently and have a strong sense of responsibility but know when to seek assistance from the team leader.
- Communication is mainly two-way.

Selecting the Approach

Each of the three leadership approaches may be equally effective. The approach selected must be based on the leadership assignment and / or appointment and the leadership team.

The factors to be considered when looking at the leadership assignment / appointment are:

- the level of simplicity of the task; and
- the level of safety of cadets.

The factors to be considered when looking at the leadership team are:

- the level of capability / competence of cadets; and
- the level of motivation of cadets.

SELECTING A LEADERSHIP APPROACH
Leadership assignment / appointment

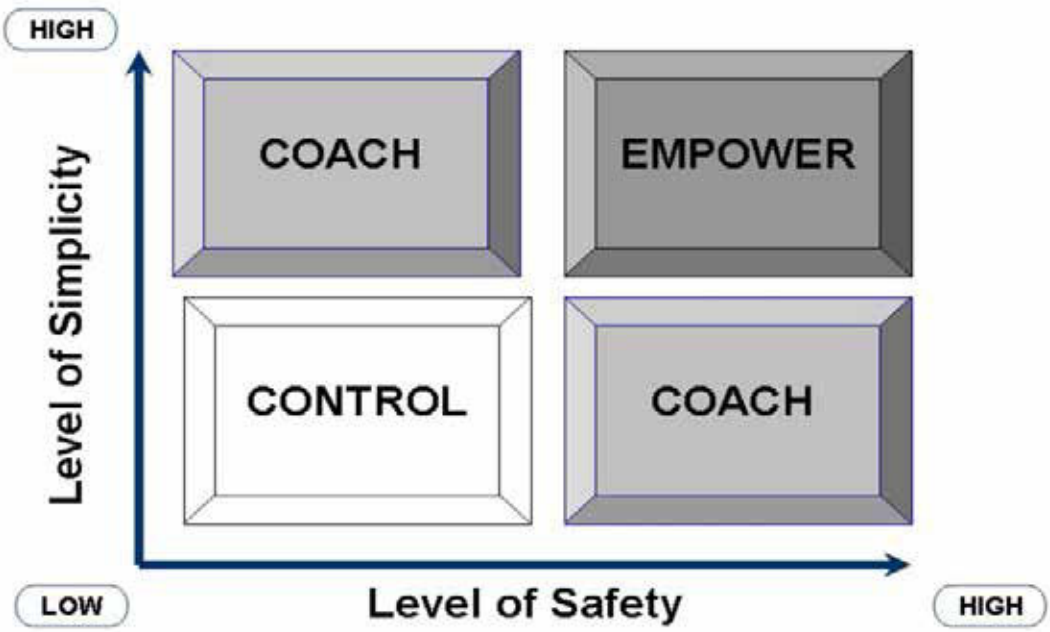

Figure 2 Selecting a Leadership Approach

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

If the task is complicated and the cadets are doing something with some risk, the team leader should choose the control approach. This allows for better supervision of team members.

If the task is simple but the cadets are doing something with some risk, the team leader should choose the coaching approach. This allows the team members an opportunity to develop their leadership skills and knowledge because the team leader provides extra feedback.

If the task is complicated but the cadets are doing something without risk, the team leader should choose the coaching approach. This allows the team members an opportunity to develop their leadership skills and knowledge because the team leader provides extra feedback.

If the task is simple and the cadets are doing something without risk, the team leader should choose the empower approach. This allows the team members develop their leadership skills and their sense of responsibility.

Have cadets give examples of when they have seen each approach used based on the simplicity of the task and the level of safety.

SELECTING A LEADERSHIP APPROACH
Leadership team

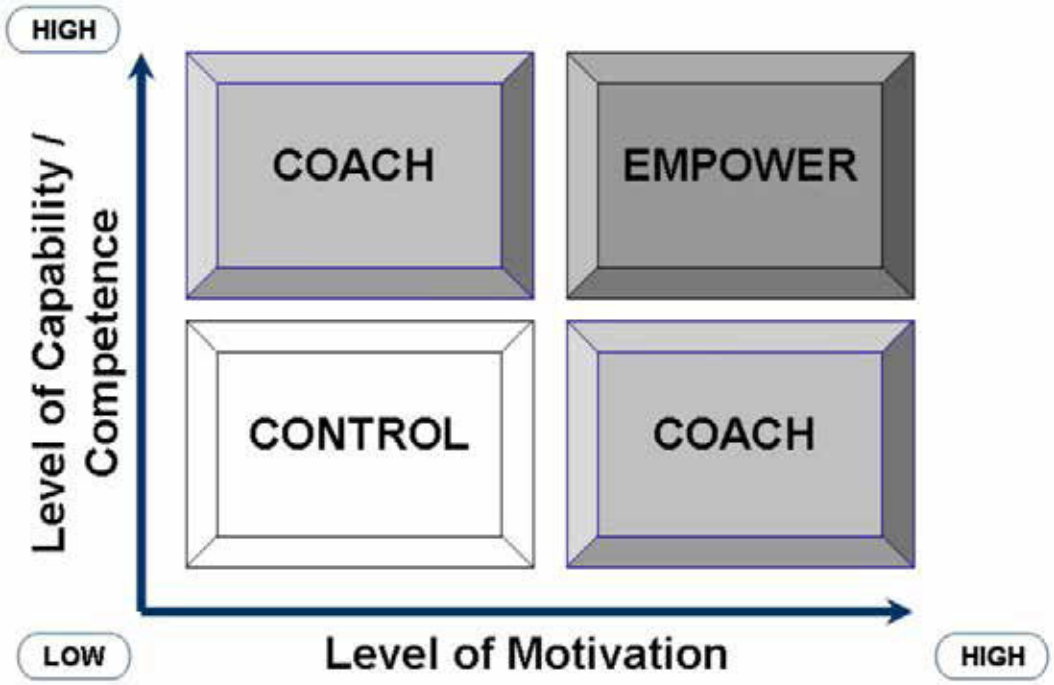

Figure 3 Selecting a Leadership Approach

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

If the task is new or the task is difficult and the cadets are uninspired or apathetic, the team leader should choose the control approach. This allows for better supervision of cadets.

If the team has experience with the task but the cadets are uninspired or apathetic, the team leader should choose the coaching approach. This allows the team members an opportunity to develop their leadership skills and knowledge because the team leader provides extra feedback.

If the task is new or the task is difficult, but the cadets are inspired and enthusiastic, the team leader should choose the coaching approach. This allows the team members an opportunity to develop their leadership skills and knowledge because the team leader provides extra feedback.

If the team has experience with the task, and the cadets are inspired and enthusiastic, the team leader should choose the empower approach. This allows the team members to develop their leadership skills and their sense of responsibility by giving opportunities to operate independently.

Have cadets give examples of when they have seen each approach used based on the capability / competence of the team and the level of motivation.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. Name the three leadership approaches used in the CP.

Q2. Which leadership approach is based on one-way communication?

Q3. What are the four topics that must be considered when selecting a leadership approach?

ANTICIPATED ANSWERS:

A1. The three leadership approaches used in the CP are:

- control,
- coach, and
- empower.

A2. The leadership approached based on one-way communication is control.

A3. The four factors that must be considered when selecting a leadership approach are:

- the level of simplicity of the task;
- the level of safety of cadets;
- the level of capability / competence of cadets; and
- the level of motivation level of cadets.

Teaching Point 4 **Conduct an activity where cadets will explain what leadership approach they would select and why for a given scenario.**

Time: 20 min Method: In-Class Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to have the cadets explain what leadership approach would be selected and why for a given scenario.

RESOURCES

Scenarios.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Distribute a scenario located at Attachment C to each cadet.
2. Allow the cadet two minutes to read and think about the scenario.

3. Have the cadet select what leadership approach they would use to complete the scenario.

4. Have one cadet read their scenario out loud and explain which leadership approach they would choose and why. The explanation of the selection must be based on the information provided during TP3.

5. Allow the other cadets to comment on the choice and reasons.

6. Repeat Steps 4 and 5 until each cadet has had a turn.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 4

The cadets' participation in the activity will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

Distribute the handout located at Attachment D to each cadet.

The cadets' participation in the in-class activity will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, 403 PC.

CLOSING STATEMENT

In every leadership opportunity, the effective team leader will use a leadership approach that enables the team leader to have a positive relationship with their team members and to accomplish tasks. Selecting and implementing leadership approaches is a life-long transformational leadership skill.

INSTRUCTOR NOTES / REMARKS

Cadets will select leadership approaches during leadership assignments and leadership appointments throughout the training year.

REFERENCES

C0-115 ISBN 0-7879-4059-3 van Linden, J. A., & Fertman, C. I. (1998). *Youth leadership*. San Francisco, CA: Jossey-Bass Inc., Publishers.

C0-410 The ASPIRA Association. (2009). *Module #5: Defining leadership styles*. Retrieved on February 12, 2009, from http://www.aspira.org/files/documents/youthdev08/U_V_M_5_dls.pdf

C0-413 University of Arkansas, Division of Agriculture, Cooperative Extension Service. (2006). *4-H volunteer leaders' series: The enabler–A leadership style*. Retrieved February 18, 2009, from http://www.uaex.edu/other_areas/publications/PDF/4HCD2.pdf

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OUTCOMES AS A RESULT OF THE TEAM LEADER'S FOCUS

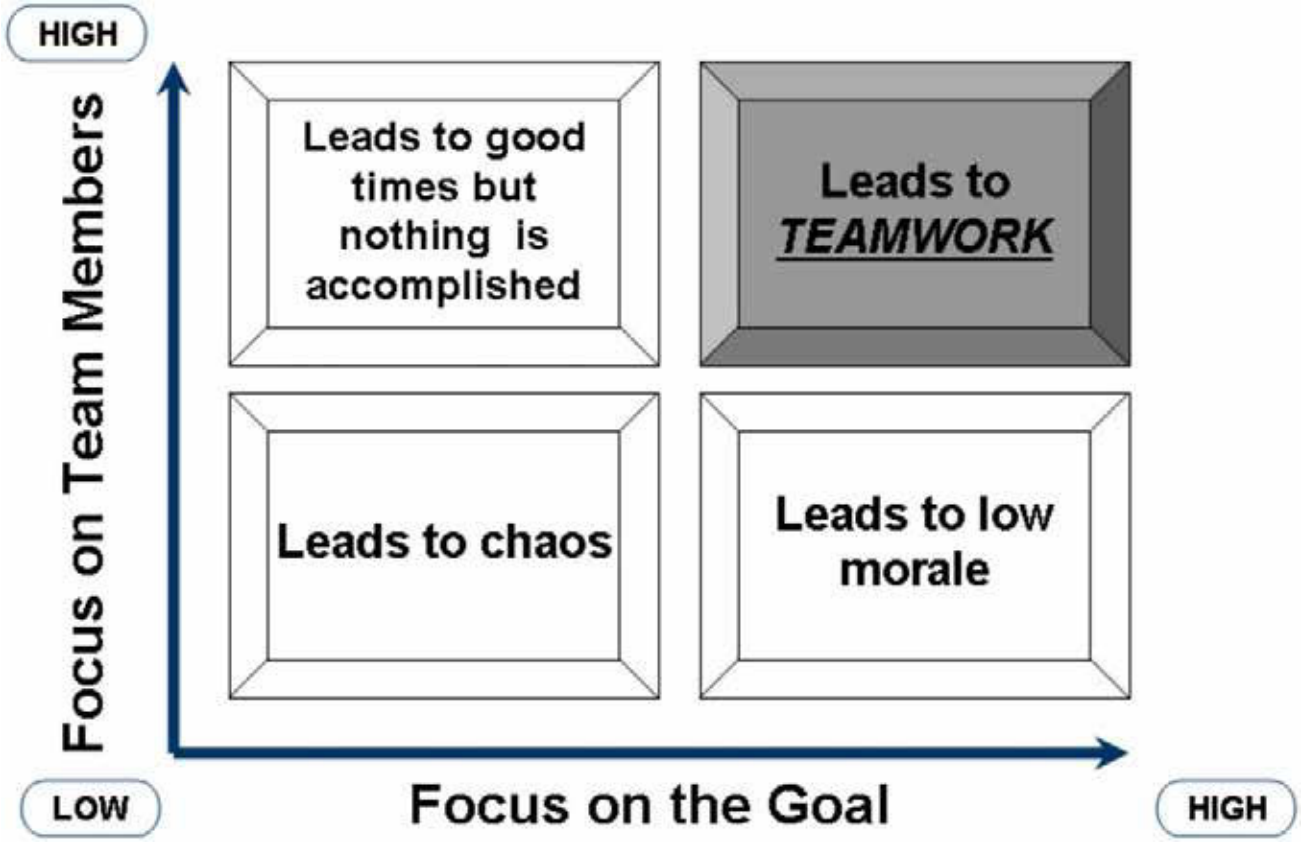

Figure A-1 Outcome as a Result of the Team Leader's Focus

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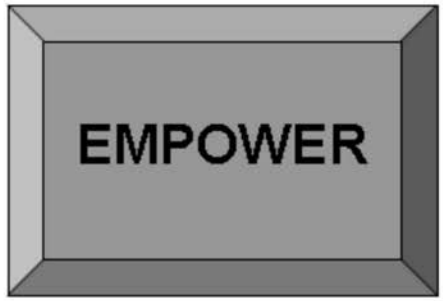
KEY ASPECTS OF EACH LEADERSHIP APPROACH

Key aspects of this approach:

- The leader defines the roles and tasks for the team members, gives them clear direction and supervises them closely.
- The leader provides detailed explanations on what needs to be done and gives the team members the information they need on how to do the task.
- Communication is mainly one-way.

Key aspects of this approach:

- The roles and tasks are still defined by the leader but ideas and suggestions are solicited from team members.
- The leader provides information and opinions but supports the team to develop possible solutions to problems while the final decision remains with the leader.
- The leader encourages members of the team to assume responsibility
- Communication is mainly two-way.



Key aspects of this approach:

- The leader empowers members of the team to make decisions and take action in areas where they have experience and expertise.
- Members of the team can operate independently and have a strong sense of responsibility but know when to seek assistance from the leader.
- Communication is mainly two-way.

Figure B-1 Key Aspects of Leadership Approaches

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence

SELECTING A LEADERSHIP APPROACH
Leadership assignment / appointment

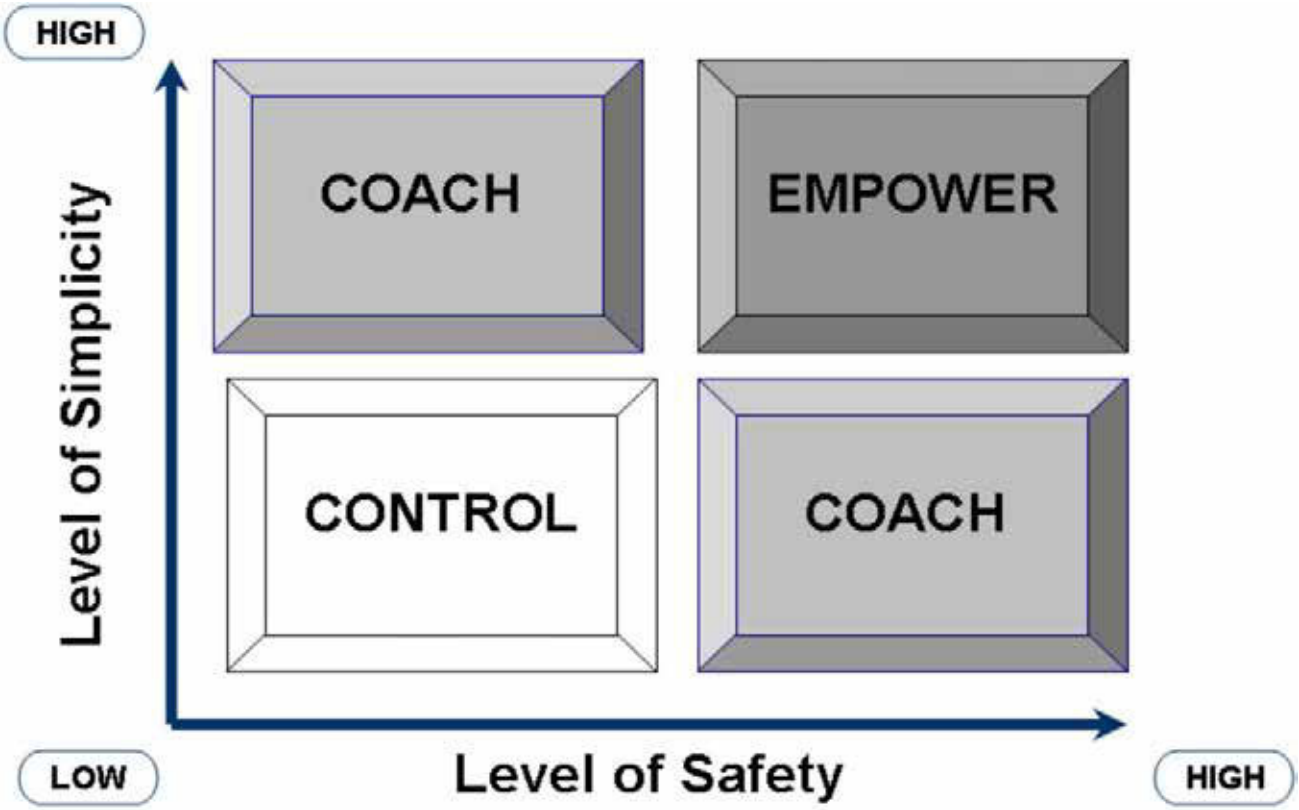


Figure B-2 Selecting a Leadership Approach

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence

SELECTING A LEADERSHIP APPROACH
Leadership team

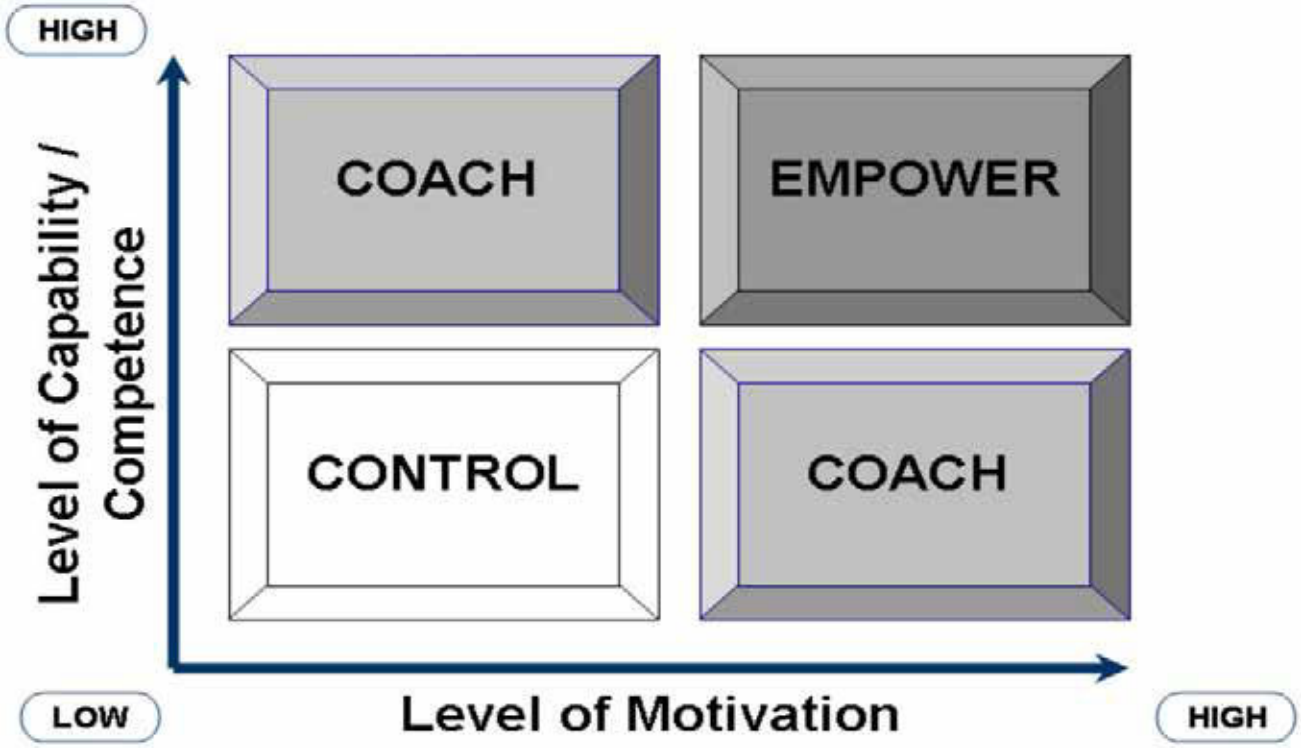


Figure B-3 Selecting a Leadership Approach

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SCENARIOS

SCENARIO #1

You and your team have been tasked with providing the first year cadets with one hour of team-building games. This activity will take place next parade night.

SCENARIO #2

You and your team have been tasked with setting up two classrooms. The class will begin in 10 minutes.

SCENARIO #3

You and your team have been tasked with operating the canteen at breaks. The canteen has not been stocked and must be ready to go in two weeks.

SCENARIO #4

You and your team have been tasked with putting away all the flags, poles and a dais from the Commanding Officer's parade. The parade will be over in two hours.

SCENARIO #5

You and your team have been tasked with taking attendance of all 13-year-old cadets before everyone departs the building. The parade night ends in 30 minutes.

SCENARIO #6

You and your team have been tasked with ensuring all lights have been turned off and all inner doors are locked at the end of every parade night.

SCENARIO #7

You and your team have been tasked with providing first year cadets with tutoring in how to wear their uniforms throughout the training year.

SCENARIO #8

You and your team have been tasked with conducting one sports activity to be held during the next parade night.

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TRANSACTIONAL AND TRANSFORMATIONAL LEADERSHIP

Transactional leadership. Leaders exchange promises of rewards and benefits to team members so the team members will fulfill agreements with the leaders. This type of leadership is task-oriented. The leader sets the rules and procedures to complete a task and the team members comply with the rules and follow the procedures to accomplish the task.

Transactional Leadership:

- Values problem and solution identification.
- Makes decisions – even if everyone has not been heard – in order to move forward.
- Uses standards and principles as guides in decision making.
- Develops the self to be a better decision maker for the group.
- Gets things done.
- Recognizes the importance of the product.
- Takes charge (personal power).

Transformational leadership. Focuses on the process of being a leader by helping team members transform themselves from followers into leaders. Transformational leadership involves assisting team members to transcend their own self-interest for the good of the group, organization or society; to consider their long-term needs to develop themselves, rather than their immediate needs; and generally, to become more aware of what is really important.

Transformational Leadership:

- Values the participation and contribution of others.
- Takes all viewpoints and advice into account before making a decision.
- Considers individuals within their contexts and situations.
- Uses individuals to test decisions.
- Develops the self first to be a better contributor to the group.
- Learns from experiences to generalize to ‘real life’.
- Recognizes the importance of the process.
- Shares leadership (group power).

Leadership within the cadet program has been designed to create transformational leadership. Transformational leadership enables the Cadet Program to meet its first aim—to develop in youth the attributes of good citizenship and leadership.

Transactional leadership focuses on the skills and tasks associated with leadership, such as public speaking, writing, delegating authority, leading meetings and making decisions. It is what people who are leaders do. Transformational leadership focuses on the process of leadership and what it means to be a leader. It is concerned with how individuals use their abilities to influence people. Think of the main difference between transactional and transformational leadership as doing leadership tasks versus being a leader.

COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 3

EO M403.03 – MOTIVATE TEAM MEMBERS

Total Time: 60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy the handouts located at Attachments A, B and C for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An in-class activity was chosen for TP 1 as it is an interactive way to provoke thought and stimulate interest among cadets about advantages and disadvantages of extrinsic and intrinsic motivators.

An interactive lecture was chosen for TP 2 to orient the cadets to encourage intrinsic motivation.

A group discussion was chosen for TP 3 as it allows the cadets to interact with their peers and share their knowledge, experiences, opinions and feelings about when and how to motivate team members.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall motivate team members.

IMPORTANCE

It is important for cadets to motivate team members because motivation is the key ingredient for success in the cadet organization. One of the duties of a team leader is to motivate team members to succeed to accomplish goals. Motivating team members also may encourage team members to develop new knowledge and skills. In addition, recognizing team members for the effort they put toward a task makes them feel appreciated.

Teaching Point 1 **Conduct an in-class activity where the cadets will explain to each other the advantages and disadvantages of extrinsic and intrinsic motivators.**

Time: 20 min Method: In-Class Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to have the cadets explain to each other the advantages and disadvantages of extrinsic and intrinsic motivators.

RESOURCES

- Two flip charts,
- Two markers,
- Extrinsic Motivators handout located at Attachment A, and
- Intrinsic Motivators handout located at Attachment B.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Divide the class into two groups.
2. Distribute the handout located at Attachment A to group A.
3. Distribute the handout located at Attachment B to group B.
4. Have each group read and complete their handout for two minutes.
5. Have group A list the examples of extrinsic motivators from their handout on the flip chart paper.
6. Have group B list the examples of intrinsic motivators from their handout on the flip chart paper.
7. After 10 minutes, have each cadet from group A find a cadet from group B with whom they will share the information.
8. Have each cadet from group A explain what extrinsic motivators are, their advantages and disadvantages, and give examples to the cadet from group B. The cadet from group B must paraphrase the answers from the cadet from group A.
9. Have each cadet from group B explain what intrinsic motivators are, their advantages and disadvantages, and give examples to the cadet from group A. The cadet from group A must paraphrase the answers from the cadet from group B.
10. Distribute the handout located at Attachment B to the cadets from group A. Distribute the handout located at Attachment A to the cadets from group B.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the activity will serve as confirmation of the TP.

Teaching Point 2 **Explain why team leaders should encourage intrinsic motivation.**

Time: 5 min Method: Interactive Lecture

WHY TEAM LEADERS SHOULD ENCOURAGE INTRINSIC MOTIVATION

Display the following statement on a presentation aid (eg, whiteboard / flip chart / OHP / multimedia projector), "Leaders do things right and they do the right things."

Have the cadets reflect upon the saying while thinking about whether extrinsic or intrinsic motivation should be used by their team members.

As a team leader, cadets should lead by example and be intrinsically motivated to accomplish goals and tasks. Although this may be difficult, team leaders need to accomplish their goals and believe the goals are worth accomplishing.

When a team leader leads by example, the team members may also realize that accomplishing goals and tasks are a good and right thing to do.

When a team leader displays intrinsic motivation, team members may realize that intrinsic motivation is an attribute to be imitated. Any positive attribute that a team member imitates may assist the team member in becoming a better leader in the future.

As an example, a team leader will wear their uniform correctly because it is the right thing to do. A team leader takes pride in their uniform and does not need to be given an external reward to do this. Team members see this behaviour and want to be like their team leader and may not continue to need external rewards. Team members begin to imitate the team leader and become intrinsically motivated.

Have the cadets give other examples of how team leaders have encouraged intrinsic motivation in their team members.

It is important to remember that extrinsic motivation will boost morale for a only short period of time.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. While using intrinsic motivation, why do team leaders need to accomplish goals and tasks?

Q2. What happens when a team leader displays intrinsic motivation?

Q3. Give an example of a team leader encouraging intrinsic motivation in team members.

ANTICIPATED ANSWERS:

A1. While using intrinsic motivation, team leaders need to accomplish goals and tasks because they believe the goals and tasks are worth accomplishing.

A2. When a team leader displays intrinsic motivation, team members realize that intrinsic motivation is an attribute to be imitated.

A3. Answers will vary.

Teaching Point 3 **Conduct a group discussion about when and how team leaders motivate team members.**

Time: 25 min Method: Group Discussion

BACKGROUND KNOWLEDGE

The purpose of the group discussion is to draw the following information from the group using the tips for answering / facilitating discussion and the suggested questions provided.

WHEN TEAM LEADERS MOTIVATE TEAM MEMBERS

The team leader must motivate team members. The skill of knowing when your team members need to be motivated will develop over time. As a team leader during Proficiency Level Four, it is important to motivate team members at every opportunity.

HOW TEAM LEADERS MOTIVATE TEAM MEMBERS

One of the most common methods used to motivate team members is to use praise. Verbal praise is a very effective way to motivate team members.

Verbal praise may be used as positive feedback before, during and at the end of tasks. If possible, team leaders should praise team members in front of others as it makes team members feel valued.

Praising Effort and Perseverance During a Task

It is very important for team leaders to praise team members for their effort and perseverance during a task. Encouraging and caring about team members is an important aspect of being a leader.

Praising the use of Different Strategies During a Task

Team leaders should praise team members when they use different strategies to during a task. Creative thinking is an important tool for leaders.

Praising Improvement During a Task

When team members have completed a task before and they complete the task again more effectively or efficiently, praise should be given. Leaders and team members should always try to improve their performance.

Encouraging the Development of Knowledge and Skills

Team leaders should encourage team members when they learn something new. Everything new that a team member learns may be used at some point to assist the team.

Praising the Completion of a Task

When team members complete a task, praise should be given. It is important to recognize dedication shown in seeing a task through to completion.

Thanking Team Members for Their Endeavours

Team leaders should try to recognize each team member for their contribution in the completion of a task. Making team members feel special is a great way to win even more cooperation from the team.

Giving credit for the completion of tasks to the team rather than yourself

When team leaders are given credit for completing a task, they should ensure that credit is given also to the team members. Recognizing the team for their accomplishments boosts the team's morale.

When team leaders model praise correctly, they lead by example. This may help team members begin to use the same strategies, thus reinforcing motivation.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. Give some examples of when a team leader may praise their team members.

Q2. Give some examples of what a team leader might say to praise their team members.

Q3. Give some examples of when you were praised by team members, team leaders, activity managers, officers or adults?

Q4. How do you feel when you are praised by team members, team leaders, activity managers, officers or adults?

Q5. Why is praise an important tool for motivating team members?

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

CONFIRMATION OF TEACHING POINT 3

The cadets' participation in the group discussion will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' participation in the group discussion in TP 3 will serve as the confirmation of this lesson.

Distribute the handout located at Attachment C to each cadet.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B 403 PC.

CLOSING STATEMENT

One of the duties of a team leader is to motivate team members to succeed to accomplish goals. Motivating team members also may encourage them to develop new knowledge and skills. In addition, recognizing team members for the effort they put towards a task makes them feel appreciated.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

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EXTRINSIC MOTIVATORS

Extrinsic motivators refer to motivators that come from outside an individual. The motivating factors are external and are given as rewards. Rewards may include grades, stickers, trophies and badges.

Advantage

Extrinsically motivated people may work hard on a task even when they have little interest in the task. The extrinsically motivated person gets satisfaction because they will receive some kind of reward. These rewards provide satisfaction and pleasure that the task itself may not provide.

Disadvantage

The disadvantage to using extrinsic motivators is that these rewards only produce short-term results and a brief boost in morale. Over time, extrinsically motivated people are only satisfied when they receive some kind of reward.

List some examples of extrinsic motivators:

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INTRINSIC MOTIVATORS

Intrinsic motivators refer to motivators that come from inside an individual rather than from any external or outside reward.

Advantage

Motivation comes from the pleasure the person gets from the task itself, the sense of satisfaction in completing the task or a sense of satisfaction from working on the task. This means that no physical reward is required.

Disadvantage

Intrinsic motivation is a learned behaviour and it takes some time to develop. Some individuals will take longer to be motivated by their inner drives rather than physical rewards.

List some examples of intrinsic motivators:

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WHEN TEAM LEADERS MOTIVATE TEAM MEMBERS

The team leader must motivate team members. The skill of knowing when your team members need to be motivated will develop over time. As a team leader during Proficiency Level Four, it is important to motivate team members at every opportunity.

HOW TEAM LEADERS MOTIVATE TEAM MEMBERS

The team leader must motivate team members. The skill of knowing when your team members need to be motivated will develop over time. As a team leader during Proficiency Level Four, it is important to motivate team members at every opportunity.

HOW TEAM LEADERS MOTIVATE TEAM MEMBERS

One of the most common methods used to motivate team members is to use praise. Verbal praise is a very effective way to motivate team members.

Verbal praise may be used as positive feedback before, during and at the end of tasks. If possible, team leaders should praise team members in front of others as it makes team members feel valued.

Praising Effort and Perseverance During a Task

It is very important for team leaders to praise team members for their effort and perseverance during a task. Encouraging and caring about team members is an important aspect of being a leader.

Praising the use of Different Strategies During a Task

Team leaders should praise team members when they use different strategies to during a task. Creative thinking is an important tool for leaders.

Praising Improvement During a Task

When team members have completed a task before and they complete the task again more effectively or efficiently, praise should be given. Leaders and team members should always try to improve their performance.

Encouraging the Development of Knowledge and Skills

Team leaders should encourage team members when they learn something new. Everything new that a team member learns may be used at some point to assist the team.

Praising the Completion of a Task

When team members complete a task, praise should be given. It is important to recognize dedication shown in seeing a task through to completion.

Thanking Team Members for Their Endeavours

Team leaders should try to recognize each team member for their contribution in the completion of a task. Making team members feel special is a great way to win even more cooperation from the team.

Giving credit for the completion of tasks to the team rather than yourself

When team leaders are given credit for completing a task, they should ensure that credit is given also to the team members. Recognizing the team for their accomplishments boosts the team's morale.

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 4

EO M403.04 – PROVIDE FEEDBACK TO TEAM MEMBERS

Total Time: 60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy the scenarios located at Attachment A. Cut out the scenarios and distribute one to each cadet. If there are more cadets than scenarios provided, multiple cadets may be given the same scenario.

Photocopy the Effective Feedback handout located at Attachment B for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An in-class activity was chosen for TPs 1 and 5 as an interactive way to provoke thought, and to stimulate an interest among cadets about feedback.

An interactive lecture was chosen for TPs 2–4 to orient the cadets to giving effective feedback.

INTRODUCTION

REVIEW

Review what “feedback” is. This is previously discussed in Proficiency Level Three and can be summarized as follows:

Feedback is a reactive form of communication. It is a response to some kind of action or input. Feedback may:

- answer a question;
- fulfill a request for information;
- reply to or rebut a point of discussion;

- suggest a revision during a task; or
- evaluate task or job performance.

OBJECTIVES

By the end of this lesson the cadet shall have provided feedback to team members.

IMPORTANCE

It is important for cadets to provide feedback because it is an essential skill for a team leader. Feedback is given to help team members improve. Providing feedback correctly to team members gives the team members regular guidance to complete their tasks.

Teaching Point 1 **Have the cadets brainstorm and prepare a list of opportunities when feedback should be provided.**

Time: 5 min Method: In-Class Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to have cadets brainstorm and prepare a list of opportunities when feedback should be provided.

RESOURCES

- Two flip charts, and
- Two markers.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into two groups.
2. Give each group a flip chart and marker.
3. Have each group brainstorm and record on the flip chart a list of opportunities when feedback should be provided.
4. Have one member of each group share their list with the class.

SAFETY

Nil

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the activity will serve as the confirmation of this TP.

Teaching Point 2 **Explain the principles of effective feedback.**

Time: 10 min Method: Interactive Lecture

PRINCIPLES OF EFFECTIVE FEEDBACK

Feedback may be given to the team as a whole or it may be given to individual team members. Giving feedback well is a skill. Feedback is a practical method for giving team members feedback, and when giving feedback, it should be frequent, accurate, specific, and timely.

Frequent. Frequent means occurring often or in close succession. Team leaders should give feedback often. After giving feedback, a team leader should note if the team members are responding. If the feedback is not being used by the team members, it may need to be restated in a different way.

Accurate. Accurate means careful, precise or lacking errors. Accurate feedback means giving feedback that is truthful and fact-based. Accurate feedback should be correct, balanced and appropriate; if not, team members may begin to lose respect for the team leader as every instance of feedback has an effect on the team members' trust.

Specific. Specific means clearly defined, definite or precise. Specific feedback means giving feedback that is detailed and clear-cut. Telling team members what they do right and wrong is not specific enough; the team leader must also tell team members exactly what steps are necessary to improve their performance. This is usually done by asking reflective questions to the team members so they generate suggestions for improvement. When giving specific feedback, team leaders should set concrete goals and deadlines for team members.

Timely. Timely means opportune, occurring, done or made at suitable or appropriate time. Timely feedback means giving feedback at the right time. The closer in time the feedback follows the performance, the more impact it will have on team members because the performance and the feedback are tied closely together.

Feedback must be based on the team member's behaviour and / or performance—not the person or their personality.

Ask cadets to give examples of when feedback has been given to them that was frequent, accurate, specific, and timely.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What does frequent feedback mean?

Q2. What does accurate feedback mean?

Q3. What does specific feedback mean?

Q4. What does timely feedback mean?

ANTICIPATED ANSWERS:

A1. Frequent feedback means giving feedback to team members often.

A2. Accurate feedback means giving feedback that is truthful and fact-based.

A3. Specific feedback means giving feedback that is detailed and clear-cut.

A4. Timely feedback means giving feedback at the right time.

Teaching Point 3 **Explain the ground rules for providing feedback.**

Time: 10 min Method: Interactive Lecture

GROUND RULES FOR PROVIDING FEEDBACK

The following ground rules for providing feedback may enable the team leader to give helpful, constructive feedback, without creating conflict or confrontational behaviour with team members.

Focusing on What is Observed

Team leaders should give feedback based on what they see because it is factual. What team leaders believe is based on supposition and inference; it is an interpretation of what they have seen. When team leaders give feedback based on interpretation rather than fact, the interpretation may be wrong.

For example:

A team member is looking at their boots as the team leader speaks to him. The team leader says "Pay attention." This is incorrect because the team leader is inferring that the team member is not paying attention. The team leader should say "You should be looking here." This statement focuses on what the team leader saw.

Focusing on Behaviour

Team leaders should give feedback based on the behaviour of team members, not on the person or personality of a team member.

For example:

A team leader observes a team member slouching against a wall. The team leader says "Don't be lazy." This is incorrect because the team leader is making judgment on the team member's personality. The team leader should say "Stand up straight." This statement does not make any judgment but focuses directly on the behaviour required by the team member.

Keeping it Neutral

Team leaders should give feedback that is unbiased and does not make judgments. When a team leader is objective when giving feedback, the team members can determine for themselves the effect of their behaviour. This presents a more meaningful learning opportunity for team members.

For example:

The team leader observes a team member arriving late again. The team leader says "You are late a lot." This is incorrect because the team leader has made a judgment on how many times the team member has been late. The team leader should say "You have been late three times in the past two months." This is a statement of fact.

Using it to Inform

Team leaders should give feedback that is enlightening and does not advise. When the team leader gives feedback, it leaves the team members free to draw their own conclusions. This freedom allows the team members to decide what actions are necessary to change their behaviour.

For example:

A team leader does an inspection and observes that a team member's boots are not up to standard. The team leader says "Everyone needs to work on their boots." The team leader should say "Our team's boots are not meeting inspection standard." This statement allows team members to decide what should be done.

If the team members cannot generate an idea, the team leader may have to explain what behaviour is required.

Making it Supportive

Team leaders should give feedback that is reassuring and not threatening. When the team leader gives feedback that is supportive, it does not sound like a put-down. The choice of language and tone must be carefully considered. Even the friendliest and best intentioned feedback can sound intimidating.

For example:

A team leader observes a team member leading a team-building activity. The team leader says "I want to talk to you about that activity." This may be perceived as frightful and ominous. The team leader should say "I thought your activity went well, but let's have a chat about making it even better." This statement starts with something positive and then offers and opportunity to discuss ways of improving.

Keeping it Simple

Team leaders should give feedback that is uncomplicated. Team members can usually only process one or two pieces of information at any one time. If team leaders overload team members with too much feedback, there is a possibility that the information will not be received. Feedback on one or two major points is more useful than feedback on six or seven minor points.

For example:

A team leader supervises as a team member conducts an inspection. The team leader notices that the team member's uniform and boots are not up to inspection standard. The team member starts the inspection at the cadet's back and continues to make errors. The team leader says "Very few things went correctly during that inspection—you look bad, you started with their backs and your comments made no sense." This is incorrect because the team leader is focusing on too many issues at once. The team leader should have said "Very few things went correctly during that inspection and we will start with your uniform." This allows the team member to focus on one behaviour at a time.

ACTIVITY

Time: 5 min

OBJECTIVE

The objective of this activity is to have the cadets identify the ground rules for providing feedback.

RESOURCES

Nil.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Have the cadets find a partner.
2. Have the cadet with the earliest birthday recite one ground rule for providing feedback to their partner.

3. Have the cadet with the latest birthday recite another ground rule for providing feedback to their partner.

4. Have the cadets take turns reciting the ground rules for providing feedback until all the ground rules have been recited.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 3

The cadets' participation in the activity will serve as the confirmation of this TP.

Teaching Point 4 **Explain the steps for providing and receiving feedback.**

Time: 10 min Method: Interactive Lecture

STEPS FOR PROVIDING FEEDBACK

The purpose for providing feedback is to let team members know how they are doing and when they are not meeting expectations. Team leaders should ensure that feedback is given when team members meet and / or exceed their commitments, as well as when team members do not meet their commitments. There are five steps for providing feedback.

Planning What to Say. Team leaders need to plan what they will say during feedback using the ground rules for providing feedback. Team leaders should think ahead of time about the team member's behaviour to be discussed. Team leaders should also have suggestions for improvement; however, these ideas should only be given if the team member cannot generate suggestions for improvement themselves.

Providing Examples of Behaviours. Team leaders need to give feedback that provides examples of the behaviour that needs to change. Giving unclear or vague examples may lead to anxiety in team members because they are not sure what behaviour needs to be modified.

Allowing Time for Feedback. Once team leaders have provided examples to the team members, they should allow time for discussion. The team members may agree, disagree or provide their perspective of the situation to the team leader. The team members may need to ask for clarification of the behaviours or they may ask for suggestions to assist them in changing their behaviour.

Motivating. Once team leaders have allowed time for discussion of the feedback, team leaders should motivate the team members. The team member may be disappointed by the feedback so the team leader should encourage and stimulate them to reach their goals.

Setting a Timeline for Action and Follow-Up. Team leaders need to set a timeframe for action by the team member to check for progress on the behaviour change. Team leaders need to follow up to ensure the team members are making the corrections required.

RECEIVING FEEDBACK

In every feedback session, there must be a sender and a receiver. When receiving feedback, there are five considerations.

Seeing Each Feedback Session as a Learning Opportunity. Each time feedback is received, the feedback session should be seen as a learning opportunity because ideas are generated on how to improve performance. Whether the idea comes from the receiver or the sender, acting on suggestions usually leads to developing skills and knowledge.

Actively Listening to the Sender's Ideas. Active listening encourages the sender to present their feedback in a non-threatening environment. Active listening on the part of the receiver shows the sender that their feedback is important.

Asking for More Information if the Ideas are Not Understood. When the sender gives feedback and the ideas are not understood, the receiver should ask for more information. By asking questions for clarification, the receiver should be able to understand the sender's intent.

Being Honest About How the Feedback is Affecting One's Emotions. Receiving feedback can make the receiver feel uncomfortable. The receiver should be honest with the sender about how the feedback is affecting them. As the receiver, try not to get emotional or take the feedback personally.

Remaining Open-Minded About Future Learning Opportunities. It is important to be open-mined about future feedback. Senders may follow up on their feedback and may even provide even more feedback. The receiver should be aware of these future learning opportunities.

CONFIRMATION OF TEACHING POINT 4

QUESTIONS:

Q1. State two of the five steps for providing feedback.

Q2. State two of the five considerations for receiving feedback.

ANTICIPATED ANSWERS:

A1. Planning what to say; providing examples of behaviours; allowing time for feedback; motivating; and setting a timeline for action and follow-up.

A2. Seeing each feedback session as a learning opportunity; actively listening to the sender's ideas; asking for more information if the ideas are not understood; being honest about how the feedback is affecting one's emotions; and remaining open-minded about future learning opportunities.

Teaching Point 5 **Using scenarios, have the cadets practice providing feedback to team members.**

Time: 15 min Method: In-Class Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to have cadets practice providing feedback to team members.

RESOURCES

If there are more cadets than scenarios provided, multiple cadets may be given the same scenario.

Scenarios located at Attachment A.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

To give each cadet an equal opportunity to give feedback, divide the time equally between the number of cadets in the group.

1. Distribute a scenario to each cadet.
2. Give the cadets one minute to read the scenario and make notes on the feedback they wish to give. Ensure the cadets know the length of time they have to give feedback.
3. Ask for a volunteer to give their feedback.
4. Have the volunteer read their scenario and then give their feedback.
5. Repeat Steps 3 and 4 until all cadets have given their feedback.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 5

The cadets' participation in the activity will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' participation in the feedback activity will serve as the confirmation of this lesson.

Distribute the Effective Feedback handout located at Attachment B to each cadet.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, 403 PC.

CLOSING STATEMENT

Providing feedback is an essential skill for a team leader. Feedback is given to help team members improve. Providing feedback correctly to team members gives the team members regular guidance to complete their tasks.

INSTRUCTOR NOTES / REMARKS

Nil.

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SCENARIOS FOR PROVIDING FEEDBACK

SCENARIO #1

One of your team members has not displayed a positive attitude toward the last three tasks assigned to him. He is complaining about having to do any work at all. His outlook is having a negative effect on the team. He is a second year cadet and wishes to go to summer training this summer.

SCENARIO #2

One of your team members has not worn her uniform to cadets twice this month. When she has worn her uniform, it has not been up to inspection standards. She is a first year cadet and does very well in her classes.

SCENARIO #3

One of your team members was tasked with setting up and tearing down a classroom for a staff meeting. He completed the task but was 10 minutes late for the set-up and 5 minutes late for the tear-down. He is always asking to be given more duties.

SCENARIO #4

One of your team members was absent from the last three parade nights and did not call to explain his absence. He is at cadets this evening. He is a first year cadet and wishes to go to summer training this summer.

SCENARIO #5

One of your team members has been late coming to class after break the last three weeks in a row. He is a volunteer at the canteen.

SCENARIO #6

One of your team members was tasked to clean up a classroom. This task was not accomplished. She is a third year cadet.

SCENARIO #7

One of your team member's hair does not meet the standard. Her hair is on her shoulders. Her uniform and boots do meet the standard.

SCENARIO #8

One of your team members has been accomplishing all tasks assigned. He has been to every parade night and volunteers for all cadet activities. He is a second year cadet and wishes to go to summer training this summer.

SCENARIO #9

One of your team members has been accomplishing three quarters of the tasks assigned. She has been to all parade nights except two. She volunteers for nearly all cadet activities. She is a second year cadet and wishes to go to summer training this summer.

SCENARIO #10

One of your team members has been accomplishing all tasks assigned and is very enthusiastic while doing them. He has been to all parade nights except two. He volunteers for nearly all cadet activities. He is a first year cadet and wishes to go to summer training this summer.

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EFFECTIVE FEEDBACK

PRINCIPLES OF EFFECTIVE FEEDBACK

Feedback is a reactive form of communication. It is a response to some kind of action or input. Feedback may:

- answer a question;
- fulfill a request for information;
- reply to or rebut a point of discussion;
- suggest a revision during a task; or
- evaluate task or job performance.

Feedback may be given to the team as a whole or it may be given to individual team members. Giving feedback well is a skill. Feedback is a practical method for giving team members feedback, and when giving feedback, it should be frequent, accurate, specific, and timely.

Frequent. Frequent means occurring often or in close succession. Team leaders should give feedback often. After giving feedback, a team leader should note if the team members are responding. If the feedback is not being used by the team members, it may need to be restated in a different way.

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Keeping it Neutral

Team leaders should give feedback that is unbiased and does not make judgments. When a team leader is objective when giving feedback, the team members can determine for themselves the effect of their behaviour. This presents a more meaningful learning opportunity for team members.

Using it to Inform

Team leaders should give feedback that is enlightening and does not advise. When the team leader gives feedback, it leaves the team members free to draw their own conclusions. This freedom allows the team members to decide what actions are necessary to change their behaviour.

Making it Supportive

Team leaders should give feedback that is reassuring and not threatening. When the team leader gives feedback that is supportive, it does not sound like a put-down. The choice of language and tone must be carefully considered. Even the friendliest and best intentioned feedback can sound intimidating.

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STEPS FOR PROVIDING FEEDBACK

The purpose for providing feedback is to let team members know how they are doing and when they are not meeting expectations. Team leaders should ensure that feedback is given when team members meet and / or exceed their commitments, as well as when team members do not meet their commitments. There are five steps for providing feedback.

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RECEIVING FEEDBACK

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Remaining Open-Minded About Future Learning Opportunities. It is important to be open-mined about future feedback. Senders may follow up on their feedback and may even provide even more feedback. The receiver should be aware of these future learning opportunities.

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 5

EO M403.05 – PARTICIPATE IN A MENTORING RELATIONSHIP

Total Time: 60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy the scenario located at Attachment B for half the cadets in the class.

Photocopy the scenario located at Attachment C for half the cadets in the class.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TPs 1 and 3 to review the mentoring relationship and to orient the cadets to the steps in a mentoring session.

A group discussion was chosen for TP 2 as it allows the cadets to interact with their peers and share knowledge, experiences, opinions and feeling about formal and informal mentoring.

A demonstration was chosen for TP 4 as it allows the instructor to explain and demonstrate a mentoring session.

A role-play was chosen for TP 5 as it provides the cadets an opportunity to view and then conduct a mentoring session under supervision.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have participated in a mentoring relationship.

IMPORTANCE

It is important for cadets to participate in a mentoring relationship to assist in the development of their leadership abilities. The mentoring relationship provides an opportunity to expand leadership knowledge and skills of participants, enhances communication skills, resolves conflict and promotes constructive feedback, and should aid in leadership development.

Teaching Point 1 **Review the mentoring relationship.**

Time: 5 min Method: Interactive Lecture

THE MENTORING RELATIONSHIP

A mentoring relationship is an association between two people that focuses on self-development. One is the mentor; the other is the cadet being mentored. Both individuals are expected to learn from the relationship.

Recognizing the Purpose of a Mentoring Relationship

The purpose of the mentoring relationship is to share experiences between the mentor and the cadet being mentored, so the cadet being mentored is better prepared to move forward through the program with knowledge and confidence.

Identifying the Benefits of Participating in a Mentoring Relationship

The most significant benefit for the mentor is the realization that they have inspired the cadet to perform at higher levels than the cadet would have without a mentor. The basic benefit for a cadet being mentored is to show growth in skills and become a more independent and effective cadet.

Contributing to a Mentoring Match

Both the mentor and the cadet being mentored will have input with whom they are matched. The mentoring relationship is based on trust; ensure a long-term and valuable connection can be made with the person chosen.

Being Open to New Things

For a mentoring relationship to be successful, both individuals must be willing to try new things. Expanding boundaries and increasing knowledge are foundations of the mentoring relationship. Being receptive to new ideas and experiences takes courage.

Being Responsive to Suggestions and Constructive Criticism

The mentor should use constructive criticism and attempt to provide feedback that will assist the cadet being mentored. The task of the cadet being mentored is to be receptive to recommendations being made.

Providing Feedback to the Mentor

It is important that the cadet being mentored provides feedback to the mentor. This feedback should be based on feelings, both positive and negative, and observations. If the cadet being mentored does not express feelings to the mentor about the relationship, then progress may be hindered.

Learning From the Mentor's Example

It is up to the mentor to set an example that the cadet being mentored would want to emulate. This example should be in all facets of the program. The cadet being mentored should learn not only from the mentor's successes but from the mentor's failures.

Participating in Mentoring Activities

The cadet being mentored must be prepared to participate in mentoring activities. These activities may include reflection, self-assessment, and discussions about successes, problems and failures. The mentor must also be prepared for each mentoring session. They need to have an agenda or plan of what will be discussed and ensure that the discussions stay on track.

Appreciating the Mentoring Relationship

An effective mentoring relationship must be respected by both people involved. Each person should have a high regard for the other in the relationship. Appreciating the other person for their effort, time and accomplishments can help ensure a long-lasting and mutually beneficial partnership.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What is the basic benefit of a mentoring relationship for the cadet being mentored?

Q2. What are the foundations of a mentoring relationship?

Q3. What are some examples of mentoring activities?

ANTICIPATED ANSWERS:

A1. The basic benefit is that the cadet being mentored will grow in their skills and become a more independent cadet.

A2. Expanding boundaries and increasing knowledge are foundations of the mentoring relationship.

A3. Mentoring activities may include reflection, self-assessment, and discussions about successes, problems and failures.

Teaching Point 2 **Discuss the difference between formal and informal mentoring.**

Time: 5 min Method: Group Discussion

BACKGROUND KNOWLEDGE

The purpose of the group discussion is to draw the following information from the group using the tips for answering / facilitating discussion and the suggested questions provided.

FORMAL MENTORING

Formal mentoring is a process where the mentor and cadet being mentored have regular meetings to discuss feedback. By the end of each meeting, expectations for the participants are agreed to. Usually, formal mentoring has specific goals such as the transfer of knowledge from the mentor to the cadet being mentored and developing the mentored cadet's leadership skills.

INFORMAL MENTORING

Informal mentoring is a practice where the mentor and the cadet being mentored discuss feedback. Informal mentoring is similar to teaching / coaching on the spot. There are no specific meetings during informal mentoring. The dialogue between the mentor and the cadet being mentored takes place as soon as possible after the activity or task.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. Do you feel there is a difference between formal and informal mentoring? What is the difference?

Q2. Which do you feel would be more appropriate for you? Why?

Q3. Is formal or informal mentoring used more often within the Cadet Program? Give some examples of formal mentoring you have seen. Give some examples of informal mentoring you have seen.

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

CONFIRMATION OF TEACHING POINT 2

The cadets' participation in the group discussion will serve as the confirmation for this TP.

Teaching Point 3 **Describe the steps of a formal mentoring session.**

Time: 10 min Method: Interactive Lecture

When a cadet mentors another individual, the cadet contributes to the social competence and cognitive competence participant outcomes of the Cadet Program as listed in CATO 11-03, *Cadet Program Mandate*.

STEPS OF A FORMAL MENTORING SESSION

Mentoring is results-oriented. The mentor and the cadet being mentored must see results for the mentoring sessions to be considered successful.

Mentoring is based on three Ps: people, performance and positive outcomes.

A formal mentoring session has four steps:

1. **Getting acquainted.** The initial mentoring session must have an introduction where both the mentor and the cadet who is being mentored provide a few details about themselves. This step should allow both participants to establish a bond of trust.

Active listening is the most important skill of a good mentor. Active listening demands that the listener put aside any internal reactions and turn their attention to the speaker without judging what is being said.

2. **Setting goals.** During this step, goals are established. Work must be done to ensure the goals are specific, measurable, achievable, relevant, and timed. These goals should be in writing.

3. **Meeting goals and expectations.** During this step, the cadet being mentored must describe how they are going to meet the goals just set. In subsequent mentoring sessions, the cadet being mentored should be praised for achieving goals but may need to account for why the goals and expectations were not met.

4. **Concluding the mentoring session.** This conclusion should begin with the cadet being mentored giving a short explanation of new goals to be met and how the cadet plans to achieve them. The mentor should encourage the cadet being mentored and arrange the time and date for the next mentoring session.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. What are the three Ps of mentoring?

Q2. What is the most important skill for a mentor?

Q3. What are the four steps of a formal mentoring session?

ANTICIPATED ANSWERS:

A1. The three Ps of mentoring are people, performance and positive outcomes.

A2. The most important skill for a mentor is active listening.

A3. The four steps of a formal mentoring session are:

1. getting acquainted;
2. setting goals;
3. meeting goals and expectations; and
4. concluding the mentoring session.

Teaching Point 4 **Demonstrate and explain a mentoring session.**

Time: 10 min Method: Demonstration

Present the following information before demonstrating a mentoring session.

Successful mentoring is based on the quality of the relationship between both participants. Trust is a basic ingredient to this relationship. The mentor must build and maintain trust by:

- keeping the mentoring relationship professional;
- keeping the conversation during the mentoring session in confidence; and
- using the ground rules for feedback during a mentoring session.

KEEPING THE MENTORING RELATIONSHIP PROFESSIONAL

Mentors must maintain a professional relationship with the cadet being mentored. The position of mentor can be rewarding but comes with inherent risks. Mentors need to remember that they are in a position of authority and must use their authority wisely. Mentors may deal with the cadets being mentored in a friendly manner; however, mentors cannot be their friends.

KEEPING THE CONVERSATION DURING THE MENTORING SESSION IN CONFIDENCE

The mentor and the cadet being mentored should keep the conversation between them in confidence. The dialogue should be kept private to avoid embarrassment by either participant.

USING THE GROUND RULES FOR FEEDBACK DURING A MENTORING SESSION

The mentor should use the ground rules for feedback during a mentoring session. It is important to provide feedback during a mentoring session correctly by:

- focusing on what is observed;
- focusing on behaviour;
- keeping it neutral;

- using it to inform;
- making it supportive; and
- keeping it simple.

This demonstration should be conducted as a role-play, where the instructor is the mentor and a cadet from the group is the cadet being mentored. Begin the demonstration by reading the scenario located at Attachment A to the cadets. Then begin introducing the remaining information in this TP while demonstrating a mentoring session.

One of the duties of a team leader is to mentor cadets. The format for a mentoring session is done using the following sequence:

1. The mentor and the cadet being mentored will sit across from each other and begin the session by introducing themselves.
2. The mentor and the cadet being mentored must set goals if goals have not been set.
3. If the goals have been set, the mentor will review the goals and expecatations and ask the cadet being mentored how they are meeting those goals and expectations. The cadet being mentored is required to use self-reflection during this review stage.

This review stage should be done by asking various questions such as:

- How do you think things are going for you?
- Do you think you have areas that need improvement?
- What areas would you like to see improvement?
- How do you think you can improve in those areas?

If the cadet being mentored has no ideas on how to improve, then suggestions by the mentor may be given.

4. Before leaving the mentoring session, the cadet being mentored must be able to explain to the mentor their plan to keep old goals or set new goals. The mentor should encourage the cadet being mentored and arrange the time and date for the next mentoring session.

Planning to keep old goals or set new goals may be done by asking various questions such as:

- What are your long-term goals?
- What are you going to do to meet your long-term goals?

If the cadet being mentored has no ideas on how to keep old goals or set new goals, then suggestions by the mentor may be given.

CONFIRMATION OF TEACHING POINT 4

QUESTIONS:

Q1. How does a mentor build trust with the cadet being mentored?

Q2. Did the mentoring session go well? Why or why not?

Q3. Give some examples of how the mentor used active listening skills?

ANTICIPATED ANSWERS:

A1. The mentor builds trust by:

- keeping the mentoring relationship professional;
- keeping the conversation during the mentoring session in confidence; and
- using the ground rules for feedback during a mentoring session.

A2. Answers will vary.

A3. Answers will vary.

Teaching Point 5 **Have the cadets role-play a mentoring session based on two given scenarios.**

Time: 20 min Method: Role-play

The scenarios for the role-play activity are located at Attachment B for Scenario 1 and Attachment C for Scenario 2.

ACTIVITY

OBJECTIVE

The objective of this activity is to have the cadets role-play a mentoring session based on given scenarios.

RESOURCES

Scenarios located at Attachments B and C.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into pairs.
2. Distribute Attachment B to one cadet in each pair.
3. Distribute Attachment C to the other cadet in each pair.

4. Designate one cadet as the mentor and the other cadet as the cadet to be mentored in each pair.
5. Supervise while one cadet mentors another cadet by:
    a. getting acquainted;
    b. setting goals;
    c. meeting goals and expectations; and
    d. concluding the mentoring session.
6. After approximately 10 minutes have the cadets change roles.
7. Repeat Steps 4 and 5 for approximately 10 minutes.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 5

The cadets' participation in the activity will serve as the confirmation for this TP.

END OF LESSON CONFIRMATION

The cadets' participation in the role-play will serve as the confirmation for this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Being mentored and mentoring others is one way to enhance skills and knowledge of leadership. The mentoring relationship develops trust and trust is the foundation of leadership. The mentoring relationship provides an opportunity to expand leadership knowledge and skills, enhances communication skills, resolves conflict and promotes constructive feedback.

INSTRUCTOR NOTES / REMARKS

Cadets will have opportunities to participate in formal and informal mentoring relationships through the training year. A cadet in Proficiency Level Four is in a position to both mentor a subordinate cadet and be mentored by a more senior cadet and / or adult staff member.

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SCENARIO FOR THE MENTORING DEMONSTRATION

The cadet being mentored is in the second year of training. The cadet is still having problems with wearing their uniform. The cadet being mentored is quite shy and does not like to ask for assistance. The cadet being mentored has set a goal of attending the Basic Leadership course for the summer.

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SCENARIO 1 FOR THE ROLE-PLAY ACTIVITY

The cadet being mentored is in their first year of training. They are having problems attending training nights each week. They have missed three of the last six training nights. The cadet being mentored is quite confident and when they attend training nights, their uniform and boots exceed inspection standard. The cadet being mentored has set a goal of attending the General Training course for the summer.

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SCENARIO 2 FOR THE ROLE-PLAY ACTIVITY

The cadet being mentored is in their second year of training. The cadet always talks while on parade and during classes and is disruptive to other members of the class. The cadet being mentored is sometimes defensive when correction is given to them. The cadet being mentored has set a goal of attending the Basic Fitness and Sports course for the summer.

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 6

EO M403.06 – ACT AS A TEAM LEADER DURING A LEADERSHIP APPOINTMENT

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Acquire the list of leadership appointments developed by the Training Officer.

Photocopy the Leadership Appointment Aide-Memoire located at Attachment B for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to orient the cadets to the leadership appointment.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to act as a team leader during a leadership appointment.

IMPORTANCE

It is important for cadets to understand the concept of and steps involved in successfully completing a leadership appointment. All cadets will be assessed during a leadership appointment in Proficiency Level Four. When appointed in their given role, each cadet must know the expectations for successful completion. An effective team leader will merge together what has been learned throughout previous leadership training and practice, including problem solving and supervision.

Teaching Point 1 **Describe a leadership assignment and a leadership appointment.**

Time: 5 min Method: Interactive Lecture

LEADERSHIP ASSIGNMENT

A leadership assignment is a specific, short- or long-term practical leadership opportunity during which the team leader must apply their leadership skills. The team leader will have temporary team members either within or outside their peer group for whom they will be responsible. The team will accomplish a singular minor duty or task.

Leadership assignments in Proficiency Level Four (PL4) may be the same as PL3. Each PL4 cadet has already completed at least two leadership assignments during their third year of training.

LEADERSHIP APPOINTMENT

A leadership appointment is a specific long-term practical leadership opportunity that is more comprehensive in nature than a leadership assignment. The team leader must apply their leadership knowledge and skills and display the core leadership qualities of a cadet. The team leader will have an assigned, established team of cadets outside their peer group. The team will accomplish a singular major duty or task. These may be organizational appointments (eg, Flight Sergeant, Squadron Commander, etc.), training appointments (eg, Proficiency Level Instructor, Leadership and Ceremonial Instructor, etc.) or supplementary appointments (eg, Canteen Steward, Drill Team Commander, etc.). In generating leadership appointments, consideration must be given to the duration of the major duty or task and frequency of opportunities to exercise leadership. The team leader is expected to meet with their team on a number of occasions over a period of time. Leadership appointments may be held by a single PL4 cadet (eg, Drill Team Commander) or the PL4 cadets may rotate through a position (eg, Canteen Steward). If a PL4 cadet rotates through a leadership appointment, the appointment must be meaningful for the cadet and be of a duration that allows the cadet to meet the objectives of applying their leadership knowledge and skills and displaying the core leadership qualities of a cadet.

The team leader must supervise team members, communicate with team members to solve problems, strive to meet the needs and expectations of team members, motivate team members, and provide feedback to team members. The team leader must attempt to develop the skills and knowledge of their team members.

Direction for the leadership appointment must be given by a superior, usually an activity leader or activity manager.

During PL4 training, each cadet will be assessed at least once on a leadership assignment and once on a leadership appointment.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What kind of team will the team leader have during a leadership appointment?

Q2. How many leadership assignments will be assessed in PL4 training?

Q3. How many leadership appointments will be assessed in PL4 training?

ANTICIPATED ANSWERS:

A1. During a leadership appointment, the team leader will have an assigned, established team of cadets outside their peer group.

A2. At least one leadership assignment will be assessed in PL4 training.

A3. One leadership appointment will be assessed in PL4 training.

Teaching Point 2 **Describe the leadership appointments that may be assigned at the squadron.**

Time: 5 min Method: Interactive Lecture

Acquire the list of leadership appointments developed by the Training Officer before instructing this class. A list of possible Proficiency Level Four leadership assignments and appointments is located at Attachment A.

SAMPLE YEAR FOUR LEADERSHIP APPOINTMENTS

Organizational Appointments

- Flight Sergeant,
- Flight Commander,
- Squadron Commander,
- Drum Major, and
- Flag Party Commander.

Training Appointments

- Proficiency Level Instructor,
- Aviation Subjects Instructor,
- Leadership and Ceremonial Instructor,
- Fitness and Sports and Instructor,
- Air Rifle Marksmanship Instructor,

- Survival Instructor, and
- Band Section Leader.

Supplementary Appointments

- Supply Assistant,
- Administration Assistant,
- Training Assistant,
- Canteen Steward,
- Drill Team Commander,
- Marksmanship Team Captain,
- Range Assistant,
- First Aid Team Captain,
- Biathlon Team Captain, and
- Sports Team Captain.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What leadership appointments are available at the squadron?

ANTICIPATED ANSWERS:

A1. Answers will vary.

Teaching Point 3 **Describe how to conduct the leadership appointment.**

Time: 15 min Method: Interactive Lecture

Each cadet has led a team through at least two leadership assignments; the steps for a leadership appointment are very similar.

When conducting the leadership appointment, use the following steps:

1. prepare for the leadership appointment;
2. brief the team members at the onset and then throughout the leadership appointment;
3. carry out the tasks associated with the leadership appointment;

4. provide feedback to the team members throughout and at the completion of the leadership appointment; and

5. meet with the activity manager throughout and at the completion of the leadership appointment to discuss the outcomes of the leadership appointment.

PREPARING FOR THE LEADERSHIP APPOINTMENT

Ensuring the Required Resources are Available

Make sure all the resources necessary for using during the appointment are available. For example, if the appointment is to act as a flag party commander, the flags, poles, etc will need to be available, both for practice and performance opportunities.

Completing a Time Appreciation

Be aware of the end date of the appointment. If the appointment is comprised of stages or phases, the leader must determine how much time to allocate to each stage or phase. All members involved in the appointment must be aware of the current date and the end date of the appointment.

Making a Plan

Make a plan to be successful in the appointment by:

1. determining what stages or phases comprise the appointment;

2. determining tasks inherent within the appointment;

3. developing a process to accomplish all tasks; and

4. identifying and allocating resources.

BRIEFING TEAM MEMBERS DURING THE LEADERSHIP APPOINTMENT

Communicating the Overall Plan

Explain how the appointment will be carried out. All team members should know what is involved as the leader carries out the appointment. This may include identifying various stages and phases.

Communicating the Tasks Involved in the Leadership Appointment

Explain the tasks involved within the leadership appointment. Leadership appointments may be comprised of a series of tasks.

Assigning Tasks to Team Members as Applicable

Assign each team member the tasks that must be completed within the scope of the appointment. Every team member should be actively engaged in a meaningful activity.

Ensuring the Team Members Understand Their Tasks

Confirm the team members understand their tasks and ask the team members if they have any questions. The team leader should also ask a few questions to various team members to ensure comprehension. When team members are assigned specific tasks, it is important they understand what is expected of them.

CARRYING OUT THE TASKS ASSOCIATED WITH THE LEADERSHIP APPOINTMENT

Supervising Team Members

Throughout the leadership appointment, the team leader will have many occasions during which to supervise team members. The most important aspect of supervision is to ensure the tasks are being conducted safely. Supervision also allows the team leader to provide ongoing feedback to team members.

Ensuring the Tasks Within the Appointment are Progressing According to the Time Allotted

Do not wait until the last minute to ensure tasks are being completed. If tasks are not being completed as planned, whether too slow or too fast, the plan may need to be adjusted and feedback should be given. Careful monitoring of team members and the overall situation will ensure the team leader is leading successfully during the leadership appointment and the major duty or task will be accomplished.

Providing Feedback to the Team Members Throughout the Appointment

The team leader will provide feedback throughout the appointment. This feedback may be given to the team as a whole or it may be given to individual team members. Feedback should be provided such that it is frequent, accurate, specific, and timely. Successful supervision allows for ongoing feedback to be provided to the team. Feedback is necessary for the team members as it will allow them to develop as leaders also.

Modifying the Plan as Required

If the plan is not working, take time to modify it. If help is required from team members, ask for it. Modifying aspects of the plan partway through the appointment may benefit the outcome; however, always keep time limits and constraints in mind. If the plan is being revised, communicate the new plan to the team members and work with them to implement it.

PROVIDING FEEDBACK TO THE TEAM MEMBERS UPON CONCLUSION OF THE LEADERSHIP APPOINTMENT

It is important to give feedback to the team members upon conclusion of the leadership appointment. It is vital for the team leader to spend time focusing on how the team members worked together to achieve a common goal. When team members successfully complete a task, praise should be given. It is important to recognize dedication shown in seeing a task through to completion. Team leaders should try to recognize each team member for their contribution to the completion of a task.

It is important to know how the team members felt about their participation in the completion of the assignment.

The team leader should ask for feedback on the appointment from the team members. This can be done using general questions about the leadership appointment, such as:

- What was learned during the appointment?
- Was the goal met? What contributed to the success?
- How did everyone interact during the appointment?
- Were there behaviours that helped and / or hindered during the appointment?
- Were there any cadets who were not motivated to participate in the activity? How did this affect the morale of the remainder of the team?
- Were there leaders that emerged from within the team?

MEETING WITH THE ACTIVITY MANAGER TO DISCUSS THE OUTCOMES OF THE LEADERSHIP APPOINTMENT

Just as the team leader will provide ongoing feedback to the team members during the leadership appointment, the team leader will need periodic feedback from the activity manager to discuss and monitor progress of the major duty or task. Feedback from the activity manager should assist the team leader in improving performance. Once the leadership appointment is concluded, the team leader should meet with the activity leader for an overall debriefing. This feedback will aid the team leader during future leadership appointments.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. List the steps to conduct a leadership appointment.

Q2. How does the team leader brief team members during a leadership appointment?

Q3. After the leadership appointment is completed, why should the team leader meet with the activity manager to discuss the appointment?

ANTICIPATED ANSWERS:

A1. The steps to conduct a leadership appointment are:

1. prepare for the leadership appointment;
2. brief the team members at the onset and then throughout the leadership appointment;
3. carry out the tasks associated with the leadership appointment;
4. provide feedback to the team members throughout and at the completion of the leadership appointment; and
5. meet with the activity manager throughout and at the completion of the leadership appointment to discuss the outcomes of the leadership appointment.

A2. The team leader briefs team members during a leadership appointment by:

1. communicating the overall plan;
2. communicating the tasks involved in the leadership appointment;
3. assigning tasks to team members as applicable; and
4. ensuring the team members understand their tasks.

A3. After the leadership appointment is completed, the team leader should meet with the activity manager to discuss the appointment because feedback from the activity manager should give the team leader ideas to help improve performance.

Distribute the Leadership Appointment Aide-Memoire located at Attachment B to each cadet.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. What kind of team will the team leader have during a leadership appointment?

Q2. What leadership appointments are available at the squadron?

Q3. List the steps to conduct a leadership appointment.

ANTICIPATED ANSWERS:

A1. The team leader for a leadership appointment will have an assigned, established team of cadets outside their peer group.

A2. Answers will vary.

A3. The steps to conduct a leadership appointment are:

1. prepare for the leadership appointment;
2. brief the team members at the onset and then throughout the leadership appointment;
3. carry out the tasks associated with the leadership appointment;
4. provide feedback to the team members throughout and at the completion of the leadership appointment; and
5. meet with the activity manager throughout and at the completion of the leadership appointment to discuss the outcomes of the leadership appointment.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan* Chapter 3, Annex B, 403 PC.

CLOSING STATEMENT

When appointed as team leader for a given major duty or task, the team leader is expected to follow a series of steps for successful conclusion of the appointment. Being able to motivate cadets, solve problems, supervise followers, give feedback and develop the skills and knowledge of team members during a leadership appointment is an expectation of all year four cadets.

INSTRUCTOR NOTES / REMARKS

Acquire the list of leadership appointments developed by the Training Officer before instructing this lesson.

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POSSIBLE YEAR FOUR LEADERSHIP ASSIGNMENTS

Recreational Marksmanship Assignments

- Set up a range for recreational marksmanship.
- Organize relays for recreational marksmanship.
- Control pellets and issue targets for recreational marksmanship.
- Conduct concurrent activities during recreational marksmanship.
- Tear down a range after recreational marksmanship.

Summer Biathlon Assignments

- Set up a range for a recreational summer biathlon activity.
- Conduct a warm-up activity prior to participating in a recreational summer biathlon activity.
- Control pellets for a recreational summer biathlon activity.
- Conduct a cool-down activity after participating in a recreational summer biathlon activity.
- Tear down a range after a recreational summer biathlon activity.

Recreational Sports Assignments

- Set up a recreational sports activity.
- Tear down a recreational sports activity.
- Organize a team for recreational sports.
- Conduct a warm-up prior to recreational sports.
- Conduct a concurrent activity during recreational sports.
- Conduct a cool-down after recreational sports.

Parade Assignments

- Set up chairs for a parade.
- Set up the dais area for a parade.
- Set up flags and parade markers for a parade.
- Tear down chairs after a parade.
- Tear down the dais area after a parade.
- Tear down flags and parade markers after a parade.

Weekly Cadet Night Assignments

- Set up classroom space.
- Rearrange classroom space.
- Tear down classroom space.

- Set up a canteen.
- Staff a canteen.
- Tear down a canteen.
- Set up a presentation area for a guest speaker.
- Tear down a presentation area for a guest speaker.
- Set up for an extracurricular activity.
- Conduct a concurrent activity.

Community Service Assignments

- Organize a team during a community service activity.
- Conduct concurrent activities during a community service activity.
- Complete a final garbage sweep.

Other Leadership Assignment Possibilities

- Ensure the safe loading and unloading of personnel on vehicles during transportation.
- Conduct uniform inspection of cadets.
- Collect and dispose of garbage after weekly parade.
- Collect, sort and dispose of recycling after weekly parade.
- Turn off lights and close windows after weekly parade.

AIR CADET SURVIVAL TRAINING ASSIGNMENTS

Prior to the Survival Training

- Distribute personal equipment.
- Label personal equipment.
- Load team equipment and supplies.

Setting Up the Bivouac Site

- Unload equipment and supplies.
- Construct a food hang.
- Set up the POL, first aid and fire points.
- Set up the female sleeping area.
- Set up the male sleeping area.
- Mark the components of the bivouac site.

Routine Tasks That Will Occur Throughout the Survival Training

- Prepare a meal for a section.
- Clean up the site after a meal.
- Prepare the bivouac site for the night.
- Organize lights out for the female cadets.
- Organize lights out for the male cadets.

Tearing Down the Bivouac Site

- Tear down the female sleeping area.
- Tear down the male sleeping area.
- Dismantle the POL, first aid and fire points.
- Load team equipment and supplies after the survival training.
- Erase signs of occupancy and complete a final garbage sweep.

After the Survival Training

- Unload equipment and supplies.
- Collect personal equipment.

AIR CADET GLIDING DAY ASSIGNMENTS

- Organize the distribution of a meal.
- Clean up the site after a meal.
- Conduct concurrent activities.
- Complete a final garbage sweep.

AIR CADET SKILLS DAY ASSIGNMENTS

- Organize the distribution of a meal.
- Clean up the site after a meal.
- Set up a skills activity.
- Organize a team for a skills activity.
- Conduct a warm-up prior to the skills activity.
- Conduct a concurrent activity during the skills activity.
- Conduct a cool-down after skills activity.
- Tear down a skills activity.
- Complete a final garbage sweep.

POSSIBLE YEAR FOUR LEADERSHIP APPOINTMENTS

Organizational Appointments

- Flight Sergeant,
- Flight Commander,
- Squadron Commander,
- Drum Major, and
- Flag Party Commander.

Training Appointments

- Proficiency Level Instructor,
- Aviation Subjects Instructor,
- Leadership and Ceremonial Instructor,
- Fitness and Sports and Instructor,
- Air Rifle Marksmanship Instructor,
- Survival Instructor, and
- Band Section Leader.

Supplementary Appointments

- Supply Assistant,
- Administration Assistant,
- Training Assistant,
- Canteen Steward,
- Drill Team Commander,
- Marksmanship Team Captain,
- Range Assistant,
- First Aid Team Captain,
- Biathlon Team Captain, and
- Sports Team Captain.

LEADERSHIP APPOINTMENT AIDE-MEMOIRE

TABLE OF CONTENTS

During year four training, each cadet will be assessed at least once on a leadership assignment and once on a leadership appointment.

LEADERSHIP ASSIGNMENT

A leadership assignment is a specific, short- or long-term practical leadership opportunity during which the team leader must apply their leadership skills. The team leader will have temporary team members either within or outside their peer group for whom they will be responsible. The team will accomplish a singular minor duty or task.

LEADERSHIP APPOINTMENT

A leadership appointment is a specific long-term practical leadership opportunity that is more comprehensive in nature than a leadership assignment. The team leader must apply their leadership knowledge and skills and display the core leadership qualities of a cadet. The team leader will have an assigned, established team of cadets outside their peer group. The team will accomplish a singular major duty or task. These may be organizational appointments (eg, Flight Sergeant, Squadron Commander, etc.), training appointments (eg, Proficiency Level Instructor, Leadership and Ceremonial Instructor, etc.) or supplementary appointments (eg, Canteen Steward, Drill Team Commander, etc.). In generating leadership appointments, consideration must be given to the duration of the major duty or task and frequency of opportunities to exercise leadership. The team leader is expected to meet with their team on a number of occasions over a period of time. Leadership appointments may be held by a single PL4 cadet (eg, Drill Team Commander) or the PL4 cadets may rotate through a position (eg, Canteen Steward). If a PL4 cadet rotates through a leadership appointment, the appointment must be meaningful for the cadet and be of a duration that allows the cadet to meet the objectives of applying their leadership knowledge and skills and displaying the core leadership qualities of a cadet.

The team leader must supervise team members, communicate with team members to solve problems, strive to meet the needs and expectations of team members, motivate team members, and provide feedback to team members. The team leader must attempt to develop the skills and knowledge of their team members.

Direction for the leadership appointment must be given by a superior, usually an activity leader or activity manager.

HOW TO CONDUCT A LEADERSHIP APPOINTMENT

When conducting the leadership appointment, use the following steps:

1. prepare for the leadership appointment;
2. brief the team members at the onset and then throughout the leadership appointment;
3. carry out the tasks associated with the leadership appointment;
4. provide feedback to the team members throughout and at the completion of the leadership appointment; and
5. meet with the activity manager throughout and at the completion of the leadership appointment to discuss the outcomes of the leadership appointment.

PREPARING FOR THE LEADERSHIP APPOINTMENT

Ensuring the Required Resources are Available

Make sure all the resources necessary for using during the appointment are available. For example, if the appointment is to act as a flag party commander, the flags, poles, etc will need to be available, both for practice and performance opportunities.

Completing a Time Appreciation

Be aware of the end date of the appointment. If the appointment is comprised of stages or phases, the leader must determine how much time to allocate to each stage or phase. All members involved in the appointment must be aware of the current date and the end date of the appointment.

Making a Plan

Make a plan to be successful in the appointment by:

1. determining what stages or phases comprise the appointment;
2. determining tasks inherent within the appointment;
3. developing a process to accomplish all tasks; and
4. identifying and allocating resources.

BRIEFING TEAM MEMBERS DURING THE LEADERSHIP APPOINTMENT

Communicating the Overall Plan

Explain how the appointment will be carried out. All team members should know what is involved as the leader carries out the appointment. This may include identifying various stages and phases.

Communicating the Tasks Involved in the Leadership Appointment

Explain the tasks involved within the leadership appointment. Leadership appointments may be comprised of a series of tasks.

Assigning Tasks to Team Members as Applicable

Assign each team member the tasks that must be completed within the scope of the appointment. Every team member should be actively engaged in a meaningful activity.

Ensuring the Team Members Understand Their Tasks

Confirm the team members understand their tasks and ask the team members if they have any questions. The team leader should also ask a few questions to various team members to ensure comprehension. When team members are assigned specific tasks, it is important they understand what is expected of them.

CARRYING OUT THE TASKS ASSOCIATED WITH THE LEADERSHIP APPOINTMENT

Supervising Team Members

Throughout the leadership appointment, the team leader will have many occasions during which to supervise team members. The most important aspect of supervision is to ensure the tasks are being conducted safely. Supervision also allows the team leader to provide ongoing feedback to team members.

Ensuring the Tasks Within the Appointment are Progressing According to the Time Allotted

Do not wait until the last minute to ensure tasks are being completed. If tasks are not being completed as planned, whether too slow or too fast, the plan may need to be adjusted and feedback should be given. Careful monitoring of team members and the overall situation will ensure the team leader is leading successfully during the leadership appointment and the major duty or task will be accomplished.

Providing Feedback to the Team Members Throughout the Appointment

The team leader will provide feedback throughout the appointment. This feedback may be given to the team as a whole or it may be given to individual team members. Feedback should be provided such that it is frequent, accurate, specific, and timely. Successful supervision allows for ongoing feedback to be provided to the team. Feedback is necessary for the team members as it will allow them to develop as leaders also.

Modifying the Plan as Required

If the plan is not working, take time to modify it. If help is required from team members, ask for it. Modifying aspects of the plan partway through the appointment may benefit the outcome; however, always keep time limits and constraints in mind. If the plan is being revised, communicate the new plan to the team members and work with them to implement it.

PROVIDING FEEDBACK TO THE TEAM MEMBERS UPON CONCLUSION OF THE LEADERSHIP APPOINTMENT

It is important to give feedback to the team members upon conclusion of the leadership appointment. It is vital for the team leader to spend time focusing on how the team members worked together to achieve a common goal. When team members successfully complete a task, praise should be given. It is important to recognize dedication shown in seeing a task through to completion. Team leaders should try to recognize each team member for their contribution to the completion of a task.

The team leader should ask for feedback on the appointment from the team members. This can be done using general questions about the leadership appointment, such as:

- What was learned during the appointment?
- Was the goal met? What contributed to the success?
- How did everyone interact during the appointment?
- Were there behaviours that helped and / or hindered during the appointment?
- Were there any cadets who were not motivated to participate in the activity? How did this affect the morale of the remainder of the team?
- Were there leaders that emerged from within the team?

MEETING WITH THE ACTIVITY MANAGER TO DISCUSS THE OUTCOMES OF THE LEADERSHIP APPOINTMENT

Just as the team leader will provide ongoing feedback to the team members during the leadership appointment, the team leader will need periodic feedback from the activity manager to discuss and monitor progress of the major duty or task. Feedback from the activity manager should assist the team leader in improving performance. Once the leadership appointment is concluded, the team leader should meet with the activity leader for an overall debriefing. This feedback will aid the team leader during future leadership appointments.

403 PC 01 ASSESSMENT RUBRIC
LEADERSHIP ASSIGNMENT

	Incomplete (I)	Completed With Difficulty (D)	Completed Without Difficulty (C)	Exceeded the Standard (E)
Select a leadership approach.	Did not select an approach appropriate to the assignment.	Selected an approach and was challenged with balancing focus on the team members and the goal.	Selected an approach and strived to balance team members and the goal and simplicity and safety of the task.	Selected the most appropriate approach with a strong balance of team members and the goal and simplicity and safety of the task.
Communicate as a team leader.	Did not communicate with team members.	Communicated with team members occasionally. Team members needed clarification on many occasions.	Communicated with team members on many occasions. Team members needed few clarifications.	Communicated to the team throughout the leadership task. Team members did not need clarification.
Supervise team members.	Did not supervise team members.	Only supervised team members at the beginning and / or end of the leadership assignment.	Supervised throughout the leadership assignment making some corrections when necessary.	Supervised throughout the leadership assignment making corrections as necessary.
Solve problems.	Did not solve problems.	Attempted to solve some problems and selected inefficient problem solving methods.	Solved most problems as they arose and often selected the appropriate problem solving method.	Solved problems as they arose and selected the most appropriate problem solving method.
Motivate team members.	Did not motivate team members.	Only motivated periodically and without enthusiasm.	Motivated frequently and with enthusiasm, with attention at times to both individuals and the team.	Motivated consistently and with enthusiasm, addressing both individuals and the team.
Provide feedback to team members.	Did not provide feedback to team members.	Provided select feedback; was not always frequent, accurate, specific and / or timely.	Provided periodic feedback and was often frequent, accurate, specific and / or timely.	Provided consistent feedback and was regularly frequent, accurate, specific and / or timely.
Meet expectations of team members.	Made no effort to meet the needs and expectations of team members.	Made some efforts to meet the needs and expectations of team members but with limited results.	Made considerable efforts to meet the needs and expectations of team members with adequate results.	Made consistent efforts to meet the needs and expectations of team members with solid results.
Complete the leadership assignment.	Did not complete the leadership assignment.		Completed the leadership assignment.	
Perform self-assessment.	Did not complete the self-assessment.		Completed the self-assessment.	

403 PC 02 ASSESSMENT RUBRIC
LEADERSHIP APPOINTMENT

	Incomplete (I)	Completed With Difficulty (D)	Completed Without Difficulty (C)	Exceeded the Standard (E)
Select a leadership approach.	Did not select appropriate approach(es) throughout the appointment.	Selected an approach and was challenged with balancing focus on the team members and the goal throughout the appointment.	Selected approach(es) throughout the appointment and strived to balance team members and the goal and simplicity and safety of the task.	Selected the most appropriate approach(es) throughout the appointment with a strong balance of team members and the goal and simplicity and safety of the task.
Communicate as a team leader.	Did not communicate with team members.	Did not communicate with team members frequently enough. Team members needed clarification on many occasions.	Communicated with team members on many occasions. Team members needed few clarifications.	Communicated with team members consistently throughout the leadership appointment. Team members did not need clarification.
Supervise team members.	Did not supervise team members.	Did not successfully apply the principles of supervision; supervision was infrequent throughout the appointment.	Supervised throughout the leadership appointment, making some corrections when necessary.	Supervised consistently throughout the leadership assignment, making corrections as necessary.
Solve problems.	Did not solve problems.	Attempted to solve some problems and selected inefficient problem solving methods.	Solved most problems as they arose and often selected the appropriate problem solving method.	Solved problems as they arose and selected the most appropriate problem solving method.
Motivate team members.	Did not motivate team members.	Only motivated periodically and without enthusiasm.	Motivated frequently and with enthusiasm, with attention at times to both individuals and the team.	Motivated consistently and with enthusiasm, addressing both individuals and the team.
Provide feedback to team members.	Did not provide feedback to team members.	Provided select feedback; was not always frequent, accurate, specific and / or timely.	Provided periodic feedback and was often frequent, accurate, specific and / or timely.	Provided consistent feedback and was regularly frequent, accurate, specific and / or timely.
Meet expectations of team members.	Made no effort to meet the needs and expectations of team members.	Made some efforts throughout the appointment to meet the needs and expectations of team members but with limited results.	Made considerable efforts throughout the appointment to meet the needs and expectations of team members with adequate results.	Made consistent efforts throughout the appointment to meet the needs and expectations of team members with solid results.
Perform self-assessment.	Did not complete the self-assessment.		Completed the self-assessment.	

COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 7

EO C403.01 – PARTICIPATE IN A LEADERSHIP SEMINAR

Total Time: 90 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Review the information on seminars located at Attachment A.

Choose one of the four seminars. Prepare all materials for the seminar located at Attachments B–E.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

A seminar method was chosen for this lesson to stimulate active participation in a tutorial setting and to allow cadets to practice reflective thinking skills. Seminars assist cadets in developing new and imaginative interpretations of leadership topics being explored. Seminars are an interactive way to exchange information on techniques and approaches to the leadership subjects being researched and discussed.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadets shall have participated in a leadership seminar.

IMPORTANCE

It is important for cadets to participate in a leadership seminar so they have an opportunity to further develop their leadership skills and knowledge. Leadership seminars allow cadets to discuss the best practices and explore leadership topics. This EO may be an introduction to the seminar format, which will be used throughout Proficiency Level Five.

Teaching Point 1 **Have the cadets participate in a leadership seminar.**

Time: 80 min Method: Seminar

Have the cadets participate in a leadership seminar on one or more of the following topics:

- problem solving,
- time management,
- communication, and
- supervision.

ACTIVITY

OBJECTIVE

The objective of this activity is to have the cadets participate in a leadership seminar.

RESOURCES

As per the selected topic (located at Attachments B–E).

ACTIVITY LAYOUT

Set up the classroom IAW the selected leadership seminar (located at Attachments B–E).

ACTIVITY INSTRUCTIONS

Follow the activity instructions IAW the selected leadership seminar (located at Attachments B–E).

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in a leadership seminar will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' participation in a leadership seminar will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Participating in leadership seminars may assist you in further developing leadership skills and knowledge. One can never know all there is to know about leadership and seminars are an important tool to further explore each leadership topic. In addition, the seminar format used during this lesson will be used throughout Proficiency Level Five.

INSTRUCTOR NOTES / REMARKS

This EO may be conducted as many as four times during Proficiency Level Four training.

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SEMINAR INFORMATION

SEMINARS

Seminars are effective ways to communicate information on a particular topic to the rest of the group. Seminars are a tutorial arrangement involving an instructor and a small group. They are best used as a part of the developmental learning process. A seminar will be meaningful and realistic when it is focused on specific needs.

Seminars have many uses. They can be used to:

- pass on new information to a group;
- provide general guidance for a group working on a project;
- exchange information on techniques and approaches being explored by members of a group; and
- develop new and imaginative solutions to problems a group is encountering.

PREPARATION OF A GROUP

Prepare the group attending the activity so that they understand the importance of the seminar and are in the proper mindset. The instructor should:

1. prepare the problem, project, or topic of study in advance of the session;
2. introduce the lesson, identify the topic and its importance / relevance to the group, and describe how the seminar will proceed prior to the actual forum; and
3. assign research or study materials on a topic, prior to the seminar, if appropriate.

HOW TO CONDUCT A SEMINAR

During a seminar, employ strategies / approaches to explore new material, solve problems and exchange information such as:

- instructor presentation;
- learner presentation;
- group discussion;
- group brainstorming; or
- group work.

Follow the discussions and lead the group to draw conclusions regarding how to solve the problem or how they will use the new information.

Finally, close the discussion by highlighting the major conclusions and decisions made.

Workshops are similar and closely related to seminars. During a workshop, the group is presented with a problem or study subject and are required to produce possible solutions. A workshop can be used as an aspect of a seminar where the group concentrates on small amounts of material.

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LEADERSHIP SEMINAR
PROBLEM SOLVING

Total Time:	90 min

PREPARATION

Photocopy Appendices 1, 4, 5 and 6 to Attachment B for each cadet.

Photocopy Appendices 2 and 3 to Attachment B.

The following components are conducted during this seminar:

Number	Component	Time
1	Conduct an in-class activity where cadets solve the NASA moon survival scenario individually.	10 min
2	Conduct an in-class activity where cadets solve the NASA moon survival scenario as a group.	20 min
3	Conduct a group discussion on the NASA moon survival scenario.	10 min
4	Explain how to use the stepladder problem-solving technique and the six thinking hats technique.	10 min
5	Conduct an in-class activity where cadets solve a problem using the stepladder or six thinking hats technique.	10 min
6	Have cadets solve problems.	15 min
7	Conduct a group discussion on the problem-solving seminar.	5 min

CONDUCT AN IN-CLASS ACTIVITY WHERE CADETS SOLVE THE NASA MOON SURVIVAL SCENARIO INDIVIDUALLY

ACTIVITY

Time: 10 min

OBJECTIVE

The objective of this activity is to have the cadets solve the NASA Survival on the Moon scenario individually.

RESOURCES

- NASA Survival on the Moon scenario and individual answer sheet located at Appendix 1 to Attachment B, and
- Pen / pencil.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Distribute the NASA Survival on the Moon scenario and individual answer sheet to each cadet.
2. Have the cadets complete the NASA Survival on the Moon scenario.

SAFETY

Nil.

CONDUCT AN IN-CLASS ACTIVITY WHERE CADETS SOLVE THE NASA MOON SURVIVAL SCENARIO AS A GROUP

ACTIVITY

Time: 20 min

OBJECTIVE

The objective of this activity is to have cadets solve the NASA Survival on the Moon scenario as a group.

RESOURCES

- NASA Survival on the Moon scenario,
- Completed NASA Survival on the Moon scenario and individual answer sheet from previous activity,
- NASA Survival on the Moon team answer sheet located at Appendix 2 to Attachment B, and
- Pen / pencil.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Distribute NASA Survival on the Moon scenario to one cadet from the group.
2. Have one cadet read the scenario to the group.
3. Have the cadets complete the NASA Survival on the Moon scenario as a group using their previous answers as a guide.
4. Review the group's answers to the NASA Survival on the Moon scenario using Appendix 3 to Attachment B.
5. Have cadets score their answers as a group and then as individuals.

SAFETY

Nil.

CONDUCT A GROUP DISCUSSION ON THE NASA MOON SURVIVAL SCENARIO

Time: 10 min

BACKGROUND KNOWLEDGE

The purpose of the group discussion is to draw the following information from the group using the tips for answering / facilitating discussion and the suggested questions provided.

TRANSACTIONAL AND TRANSFORMATIONAL LEADERSHIP

Transactional leadership. Leaders exchange promises of rewards and benefits to team members so the team members will fulfill agreements with the leaders. This type of leadership is task-oriented. The leader sets the rules and procedures to complete a task and the team members comply with the rules and follow the procedures to accomplish the task.

Transactional Leadership:

- Values problem and solution identification.
- Makes decisions – even if everyone has not been heard – in order to move forward.
- Uses standards and principles as guides in decision making.
- Develops the self to be a better decision maker for the group.
- Gets things done.
- Recognizes the importance of the product.
- Takes charge (personal power).

Transformational leadership. Focuses on the process of being a leader by helping team members transform themselves from followers into leaders. Transformational leadership involves assisting team members to transcend their own self-interest for the good of the group, organization or society; to consider their long-term needs to develop themselves, rather than their immediate needs; and generally, to become more aware of what is really important.

Transformational Leadership:

- Values the participation and contribution of others.
- Takes all viewpoints and advice into account before making a decision.
- Considers individuals within their contexts and situations.
- Uses individuals to test decisions.
- Develops the self first to be a better contributor to the group.
- Learns from experiences to generalize to ‘real life’.

- Recognizes the importance of the process.
- Shares leadership (group power).

Leadership within the cadet program has been designed to create transformational leadership. Transformational leadership enables the Cadet Program to meet its first aim—to develop in youth the attributes of good citizenship and leadership.

Transactional leadership focuses on the skills and tasks associated with leadership, such as public speaking, writing, delegating authority, leading meetings and making decisions. It is what people who are leaders do. Transformational leadership focuses on the process of leadership and what it means to be a leader. It is concerned with how individuals use their abilities to influence people. Think of the main difference between transactional and transformational leadership as doing leadership tasks versus being a leader.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. Based on the two previous activities, which decisions were easier to make—individually or as a group?

Q2. Which do you think was more effective?

Q3. Give some examples of how decisions were made.

Q4. Who influenced the decisions and how?

Q5. Could better decisions have been made? How?

Q6. How was conflict managed?

Q7. How do you feel about the decisions?

Q8. Were you satisfied with each decision? Why or why not?

Q9. What would you change if you did this again?

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

EXPLAIN HOW TO USE THE STEPLADDER PROBLEM SOLVING TECHNIQUE AND THE SIX THINKING HATS TECHNIQUE

Time: 10 min

The Stepladder Technique

The stepladder technique is a step-by-step approach to help ensure that all members of the group are heard. The technique allows shy, quiet people to present their ideas to the group before other group members may influence them. This method allows everyone to hear many different viewpoints before reaching a final decision.

The stepladder technique steps:

1. present the problem or task;
2. form the core group of two members;
3. share ideas and discuss;
4. add the third member to the group;
5. share ideas and discuss;
6. add the fourth member to the group;
7. share ideas and discuss;
8. add additional members, one at a time, sharing ideas and discussing after each, until all members have been added; and
9. reach a final decision.

Many groups begin to lose effectiveness and the ability to make quality decisions if they have too many members. Keep the group small—four to six team members—to maximize effectiveness.

The Six Thinking Hats Technique

Six Thinking Hats is a good technique for looking at the effects of a decision from a number of different points of view. It allows necessary emotion and scepticism to be brought into what would otherwise be purely rational decisions. It opens up the opportunity for creativity within decision making. The Six Thinking Hats technique helps groups make better decisions by moving people outside their habitual ways of thinking. For example, persistently pessimistic cadets may be asked to be positive and creative.

Each Thinking Hat is a different style of thinking. These are:

White Hat. With this thinking hat, cadets must focus on the data available. They must look at the information they have and see what can be learned from it. They must look at gaps in the knowledge and either try to fill them or account for them. These cadets will analyze past trends and try to predict on the basis of what is known, what may happen.

Red Hat. With this thinking hat, cadets must look at the decision using intuition, gut reaction and emotion. They must try to think how other people may react emotionally, and try to understand the responses of others who do not know how the decision was made.

Black Hat. With this thinking hat, cadets must look at things pessimistically, cautiously and defensively. They try to see why ideas and approaches might not work. This may highlight the weak points in a plan or course of action. This allows the group to alter the approach or prepare contingency plans to counter problems that arise.

Yellow Hat. With this thinking hat, cadets must think only positively. They must keep an optimistic viewpoint that helps to see all the benefits and opportunities that arise from the decision or course of action. Yellow hat thinking helps to keep the group going when everything seems to be gloomy or difficult.

Green Hat. With this thinking hat, cadets must think creatively. They try to develop new, innovative and imaginative solutions to the problem or task. These cadets must think outside the box and not critique their own ideas before expressing them.

Blue Hat. With this thinking hat, cadets must focus on process control. This is the hat worn by people chairing the problem-solving session. When running into difficulties because ideas are running dry, they may direct cadets into a different coloured hat.

Using the Six Thinking Hats technique should improve the quality of decision-making. By "wearing" each of the thinking hats in turn, decisions are systematically explored.

CONDUCT AN IN-CLASS ACTIVITY WHERE CADETS SOLVE A PROBLEM SCENARIO USING THE STEPLADDER OR SIX THINKING HATS TECHNIQUE

ACTIVITY

Time: 10 min

OBJECTIVE

The objective of this activity is to have cadets solve a problem using the stepladder or Six Thinking Hats technique.

RESOURCES

Scenario located at Appendix 4 to Attachment B.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Have the cadets select the stepladder technique or six thinking hats technique to solve the scenario.
2. Distribute the scenario to each cadet.
3. Have the cadets read the scenario.
4. Divide the cadets into groups of no more than six.
5. Have the cadets solve the scenario using the technique selected.

SAFETY

Nil.

HAVE CADETS SOLVE PROBLEMS

ACTIVITY

Time: 15 min

OBJECTIVE

The objective of this activity is to have the cadets solve problems.

RESOURCES

- Brainteasers and puzzles located at Appendix 5 to Attachment B, and
- Answer keys located at Appendix 6 to Attachment B.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

There are 10 problems to be solved. Cadets do not have to solve all the problems. Cadets should work on the problems in small groups.

1. Distribute Appendix 5 to Attachment B to each cadet.
2. Divide cadets into groups of no larger than three.
3. Have cadets solve the problems.
4. After 12 minutes, distribute answer keys located at Appendix 6 to Attachment B to each group.
5. Have the groups check their answers.

SAFETY

Nil.

CONDUCT A GROUP DISCUSSION ON THE PROBLEM-SOLVING SEMINAR

Time: 5 min

The purpose of the group discussion is to have cadets practice reflective thinking skills. Use the tips for answering / facilitating discussion and the suggested questions provided.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. What have you learned during this seminar?

Q2. Which activities did you enjoy during the seminar? Why?

Q3. Will this information be useful to you?

Q4. Where do you think you will use the information from this seminar?

Q5. Now that you know the Stepladder and Six Thinking Hats Techniques, how have you changed your approach to solving a problem? How will this impact your decision-making?

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

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NASA Survival on the Moon

Scenario:

You are a member of a space crew originally scheduled to rendezvous with a mother ship on the lighted surface of the moon. However, due to mechanical difficulties, your ship was forced to land at a spot some 200 kilometres from the rendezvous point. During re-entry and landing, much of the equipment aboard was damaged and, since survival depends on reaching the mother ship, the most critical items available must be chosen for the 200-kilometre trip. The 15 items left intact and undamaged after landing are listed on the next page. Your task is to rank them in order of importance for your crew to help them reach the rendezvous point. Place the number 1 by the most important item, the number 2 by the second most important, and so on through number 15 for the least important.

NASA Survival on the Moon Individual Answer Sheet

Name _____

To be completed individually.

_____ Box of Matches

_____ Food Concentrate

_____ 15 Metres of Nylon Rope

_____ Parachute Silk

_____ Portable Heating Unit

_____ Two .45 Calibre Pistols

_____ One Case of Dehydrated Milk

_____ Two 50-Kilogram Tanks of Oxygen

_____ Stellar Map

_____ Self-Inflating Life Raft

_____ Magnetic Compass

_____ 20 Litres of Water

_____ Signal Flares

_____ First Aid Kit, Including Injection Needle

_____ Solar-Powered FM Receiver-Transmitter

NASA Survival on the Moon Team Answer Sheet

TEAM NAME_____

To be completed as a group.

Team ranking NASA Ranking

_____ Box of Matches _____

_____ Food Concentrate _____

_____ 15 Metres of Nylon Rope _____

_____ Parachute Silk _____

_____ Portable Heating Unit _____

_____ Two .45 Calibre Pistols _____

_____ One Case of Dehydrated Milk _____

_____ Two 50-Kilogram Tanks of Oxygen _____

_____ Stellar Map _____

_____ Self-inflating Life Raft _____

_____ Magnetic Compass _____

_____ 20 Litres of water _____

_____ Signal Flares _____

_____ First Aid Kit, Including Injection Needle _____

_____ Solar-Powered FM Receiver-Transmitter _____

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Answers to the Survival on the Moon

ITEM	NASA RANKING	NASA REASONING
Box of Matches	**15**	Virtually worthless—there is no oxygen on the moon to sustain combustion.
Food Concentrate	**4**	Efficient means of supplying energy requirements.
15 Metres of Nylon Rope	**6**	Useful for scaling cliffs and for tying team members together while scaling cliffs.
Parachute Silk	**8**	Protection from the sun's rays.
Portable Heating Unit	**13**	Not needed unless on the dark side of the moon.
Two .45 Calibre Pistols	**11**	Possible means of self-propulsion.
One Case of Dehydrated Milk	**12**	Bulkier duplication of food concentrate.
Two 50-Kilogram Tanks of Oxygen	**1**	Most pressing survival need (weight is not a factor since gravity is one-sixth of the Earth's).
Stellar Map	**3**	Primary means of navigation—star patterns appear essentially identical on the moon as on Earth.
Self-Inflating Life Raft	**9**	Carbon dioxide bottle in the military raft may be used for propulsion.
Magnetic Compass	**14**	The magnetic field on the moon is not polarized, so it is worthless for navigation.
20 Litres of Water	**2**	Needed for tremendous liquid loss on the light side of the moon.
Signal Flares	**10**	Use as distress signal when the mother ship is sighted.
First Aid Kit Including Injection Needle	**7**	Needles connected to vials of vitamins and medicines will fit in a special aperture in the NASA spacesuit.
Solar-Powered FM Receiver-Transmitter	**5**	For communications with the mother ship (FM radio requires line of sight transmission and can only be used over a short range).

Scoring:

For each item, mark the number of points that your team score differs from the NASA ranking, then add up all the points. Disregard plus or minus differences. The lower the total, the better your score.

0–25 excellent

26–32 good

33–45 average

46–55 fair

56–70 poor—suggests use of Earth-bound logic.

71–112 very poor—you are one of the casualties of the space program!

STEPLADDER OR SIX THINKING HATS SCENARIO

Your squadron has been given a large grant from the town / city of $20 000. The squadron staff want to spend the money on a tour. The entire squadron can go on a fully paid tour of Washington, DC for seven days or the squadron can send two cadets from each proficiency level on a fully paid tour for one week to World War II sites in Europe. A decision must be made and the squadron staff would like your input.

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PROBLEMS TO SOLVE

Problem #1

Four women, Louise, Lise, Carol and Lily, are seated at a table. They are chatting about their holidays.

They went to California, Texas, Florida and Arizona riding a lion, a tiger, a zebra, and a pony.

Question: What are the destinations and mode of transportation for each woman?

Hints:

- The woman riding the zebra did not smoke.
- Carol declared that she loved Miami.
- The woman riding the tiger had a cigarette with Lily.
- Louise said "Buy your pony a new saddle, Carol. I saw some during our trip to California?"
- The women riding the tiger mentioned that she has seen the Alamo in Texas.
- Lise was a chain smoker.

Problem #2

An army general wanted 10 soldiers to cross a river. There was no bridge and the soldiers could not swim. The general saw a row boat with two children on board. The boat could only hold two children or one soldier.

Question: How did the soldiers cross the river in the boat?

Problem #3

A crime has been committed. A life has been taken. The name, address and personal information are known to the police. However, this person shall never go to trial.

Question: Why?

Problem #4

A knight wanted to visit a princess. He had to arrive exactly at 1700 hours. If he travelled at 15 kilometres per hour, he would arrive one hour too early. If he travelled at 10 kilometres per hour, he would arrive one hour too late.

Questions:

At what time should he leave?
What distance will he travel?
At what speed will he travel?

Problem #5

A large ship is ignited on the high seas. All sailors, except the captain, leave aboard lifeboats. The captain dives and swims under the water for 90 metres. He hears an explosion. When he surfaces, he immediately hears another explosion. The captain rejoins a lifeboat and is pulled aboard by the sailors.

The captain mentions that he heard two explosions. The sailors state that they only heard one explosion. Both the captain and the sailors are telling the truth.

Question: How is this possible?

Problem #6

A girl, who was just learning to drive, went down a one-way street in the wrong direction, but did not break the law.

Question: How is this possible?

Problem #7

After school on Monday, Jody found this note in code taped to her locker.

Yg ctg jcxkpi c uwtrtkug rctva hqt Ou. Dtqyp.

At first, she couldn't figure it out. Then someone whispered in her ear, "M stands for K." Just that one clue helped Jody crack the code.

Question: What does the note say? How did you crack the code?

Problem #8

One man, one woman and some kids are out boating. There were three boats—one red, one blue, and one yellow—out on the river that morning. The boats were three different types: a yacht, a sailboat and a canoe. The people on the boats were from three different countries: France, Sweden and Italy.

Questions: What colour is each boat? What type is each boat? Who is on each boat? Which country do the people come from?

Hints:

- The woman is not in a yellow boat and is not from France.
- The red boat is not from Italy.
- The kids are in a blue boat, but they are not from Italy or Sweden.
- The man and his dog are on a yacht with an Italian flag.
- The sailboat is from France, while the canoe is red.

Problem #9

Amir tied two sacks of salt to the back of his donkey and headed for the market to sell the salt. On the way, Amir and the donkey passed a stream. The donkey jumped in to cool himself. As a result, much of the salt dissolved into the water, ruining the salt for Amir but improving matters for the donkey because his load became much lighter. Amir tried to get to the market on the following days, but the donkey always ruined the salt. Finally, Amir decided to teach the donkey a lesson. He once again set out with the donkey and the two sacks.

Question: What did Amir do differently this time so that after that day the donkey stopped taking a swim?

Problem #10

Train A and train B are crossing the country, from coast to coast, over 5 000 kilometres of railroad track. Train A is going from east to west at 80 kilometres per hour, and Train B is going from west to east at 90 kilometres per hour.

Question: Which train will be closer to the west coast when they meet?

Hint: You don't have to do any math to get the answer.

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ANSWER KEY TO PROBLEMS

Problem #1

Answer:

Louise - California - zebra
Lise - Texas - tiger
Carol - Florida - pony
Lily- Arizona - lion

Problem #2

Answer:

Start with two children crossing. One child gets out of the boat, the other child returns in the boat. The second child gets out of the boat and the soldier crosses. The first soldier gets out of the boat, and the first child gets in the boat and returns. Repeat the process until all the soldiers, the general and the children have crossed the river.

Problem #3

Answer:

No person shall go to trial because the crime was a suicide.

Problem #4

Answer:

He should leave at 1200 hours. He will travel 60 kilometres. He will travel 12 kilometres per hour.

Problem #5

Answer:

It is true because sound travels more rapidly under water than on the surface.

Problem #6

Answer:

She was walking.

Problem #7

Answer:

The message reads, “We are having a surprise party for Ms. Brown.” M stands for K tells you that the alphabet has shifted two letters.

STRATEGY: Write the alphabet in a row, with a second alphabet below it, starting with a below c. When you get to x in the second row, go to the a in the top row and write y below it and z below b.

Problem #8

Answer:

Yellow - yacht - man - Italy
Red - canoe - woman - Sweden
Blue - sailboat - kids - France

Problem #9

Answer:

Amir loaded the sacks not with salt but with sand. When the donkey jumped in the stream and got the sacks wet, they became much heavier.

Problem #10

When the trains meet, they will be at exactly the same point. Therefore, they will each be the same distance from the west coast.

LEADERSHIP SEMINAR
TIME MANAGEMENT

Total Time:	90 min

PREPARATION

Photocopy Appendix 1 to Attachment C.

The following components are conducted during this seminar:

Number	Component	Time
1	Explain that time management is a myth.	5 min
2	Conduct an activity where cadets brainstorm a list of time stealers.	10 min
3	Conduct an activity where cadets reflect on and create a list of activities where they spend the most time and the least time.	10 min
4	Explain procrastination.	10 min
5	Conduct an activity where cadets brainstorm time-management tips.	10 min
6	Explain time-management tips for teens.	5 min
7	Explain preparing to-do lists.	5 min
8	Conduct a group discussion on how technology may aid in time management.	5 min
9	Conduct an in-class activity where cadets create a to-do list based on a scenario.	15 min
10	Conduct a group discussion on the time-management seminar.	5 min

EXPLAIN THAT TIME MANAGEMENT IS A MYTH

Time: 5 min

TIME MANAGEMENT IS A MYTH

There are only 24 hours in every day. Time never changes. Time management does not refer to managing time; it refers to managing ourselves. Organizing and managing workload and free time is what is meant by time management. It means what one does with the time one has.

CONDUCT AN ACTIVITY WHERE CADETS BRAINSTORM A LIST OF TIME STEALERS

BACKGROUND KNOWLEDGE

Time stealers include:

- interruptions (telephones, visitors, etc),
- procrastination and indecisions,
- dealing with minor tasks that should have be delegated,
- acting with incomplete information,
- lack of planning,

- stress and fatigue,
- inability to say "No", and
- personal disorganization.

ACTIVITY

Time: 10 min

OBJECTIVE

The objective of this activity is to have the cadets brainstorm a list of time stealers.

RESOURCES

- Two flip charts, and
- Two markers.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into two groups.
2. Give each group a flip chart and marker.
3. Have each group brainstorm and record on the flip chart a list of time stealers.
4. Have one member from each group share their list with the class.

SAFETY

Nil.

CONDUCT AN ACTIVITY WHERE CADETS REFLECT ON AND CREATE A LIST OF ACTIVITIES WHERE THEY SPEND THE MOST TIME AND THE LEAST TIME

Time: 10 min

OBJECTIVE

The objective of this activity is to have the cadets reflect on and create a list of activities where they spend the most time and the least time.

RESOURCES

- Paper, and
- Pen / pencil.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Distribute paper and pen / pencil to each cadet.

2. Explain to the cadets that they are to reflect and create a list of activities where they spend the most time and the least time.

Do not force cadets to share their list if they do not wish.

3. After six minutes have the cadets present their list to the class.

SAFETY

Nil.

EXPLAIN PROCRASTINATION

Time: 10 min

WHY DO CADETS PROCRASTINATE?

Procrastination is putting things off that should be focused on right now. Usually, things are put off in favour of doing something that is more enjoyable or that is easier to accomplish. Procrastinators work as many hours in a day as other cadets but procrastinators invest their time in the wrong tasks.

Sometimes this is simply because cadets do not understand the difference between urgent tasks (time-sensitive) and important tasks (significant), and they jump straight into urgent tasks that are not actually important. They may think they are doing the right thing because they are reacting quickly or they may simply be driven by the person whose demands are the loudest.

Important. Of great effect or consequence; significant.

Urgent. Demanding or requiring immediate action or attention.

Causes of Procrastination

Another common cause of procrastination is that cadets feel overwhelmed by the task. Cadets may not know where to begin, or they may doubt they have the skills or resources to complete the task. Cadets may seek comfort in doing tasks that they know they are capable of completing.

Other Causes of Procrastination

Other causes of procrastination include:

- waiting for the "right" mood or the "right" time to tackle the important tasks;
- a fear of failure or success;
- underdeveloped decision-making skills;

- poor organizational skills; and
- perfectionism (cadets think they do not have the right skills or resources to accomplish the task perfectly so they do not begin at all).

Ask cadets to name some tasks that they might procrastinate on rather than getting started.

HOW TO OVERCOME PROCRASTINATION

Whatever the reason behind procrastination, it must be acknowledged, dealt with and controlled.

1. **Recognize that you are procrastinating.** Be honest with yourself; you probably know when you are procrastinating.
2. **Work out why you are procrastinating.** Why you procrastinate can depend on both you and the task. Understanding the reason for procrastination for each situation will help you select the best approach to overcoming your reluctance to get going.
3. **Get over it.** If you are putting something off because you just do not want to do it, and you can not delegate the work, you need to find a way to motivate yourself. The following approaches may be helpful:
   - make up you own rewards;
   - ask someone to check up on you; or
   - identify unpleasant consequences of not doing the task.

   If you are putting off starting a project because you find it overwhelming, you may need a different approach. Here are some tips:
   - break the project into smaller, or manageable tasks;
   - start with some quick small tasks, even if these are not the logical place to start. This will help you feel like you are achieving results.

CONDUCT AN ACTIVITY WHERE CADETS BRAINSTORM TIME-MANAGEMENT TIPS

ACTIVITY

Time: 10 min

OBJECTIVE

The objective of this activity is to have the cadets brainstorm time-management tips.

RESOURCES

- Flipchart, and
- Marker.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into groups of no more than six.
2. Have the cadets select a recorder for the brainstorming session.
3. Explain to cadets that they are to create a list of time-management tips for other cadets.
4. Have the selected cadet record the suggestions.
5. Have each group share their tips with the rest of the class.

SAFETY

Nil.

EXPLAIN TIME-MANAGEMENT TIPS FOR TEENS

Time: 5 min

If it seems like there is never enough time in the day to get everything done, use the following tips to organize and take control of the situation:

- make a to-do list;
- use spare minutes wisely;
- it's okay to say "No";
- find the right and best time for work;
- get a good night's sleep;
- communicate the schedule to others;
- create a time budget and plan accordingly;
- don't waste time agonizing; get on with it; and
- set realistic goals.

EXPLAIN HOW TO PREPARE TO-DO LISTS

Time: 5 min

A to-do list is a prioritized list of tasks that need to be completed. It lists what must be done with the important tasks at the top of the list and the least important tasks at the bottom of the list.

Keeping to-do lists ensures that all tasks that need to be accomplished are captured in one place. This is essential in order not to forget things. By prioritizing work, a plan is created. This ensures that tasks that need immediate attention are completed first.

Preparing a To-do List

Begin by writing down all of the tasks that need to be completed. If the tasks are large, break them into parts. All tasks on the list should take no more than 1–2 hours to complete.

How to Prioritize the To-do List

The next step in creating a useful to-do list is to prioritize each task on the to-do list. There are many ways to prioritize but usually priorities are based on time constraints and / or the benefit of the accomplishment of the task. For example, a priority based on time constraints could be if you have to take a sibling to a ball game at six in the evening, and the clock reads 5:30 pm, that task will move to a very high priority. An example based on a benefit of the task could be if you wish to buy a newer car, you cannot miss shifts at work. Shifts at work will have a very high priority.

Allocate priorities for each task from A (very important or very urgent) to F (unimportant or not urgent at all). If too many tasks have a high priority, go through the to-do list again and demote the less important tasks. Once this has been accomplished, rewrite the list in order of priority.

CONDUCT A GROUP DISCUSSION ON HOW TECHNOLOGY MAY AID IN TIME MANAGEMENT

Time: 5 min

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. What types of technology may help in time-management?

Q2. How can those technologies help?

Q3. Do you use technologies to help keep you on track and organized?

Q4. How do they help you?

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

CONDUCT AN IN-CLASS ACTIVITY WHERE CADETS CREATE A TO-DO LIST BASED ON A SCENARIO

ACTIVITY

Time: 15 min

OBJECTIVE

The objective of this activity is to have the cadets create a to-do list based on a scenario.

RESOURCES

- Scenario located at Appendix 1 to Attachment C,
- Paper, and
- Pen / pencil.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Distribute the scenario to each cadet.
2. Have cadets create a to-do list based on the scenario.
3. Have cadets present their to-do list to the group, and explain why they prioritized their list the way they did.

SAFETY

Nil.

CONDUCT A GROUP DISCUSSION ON THE TIME-MANAGEMENT SEMINAR

Time: 5 min

BACKGROUND KNOWLEDGE

The purpose of the group discussion is to have cadets practice reflective thinking skills. Use the tips for answering / facilitating discussion and the suggested questions provided.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. What have you learned during this seminar?

Q2. Which activities did you enjoy during the seminar? Why?

Q3. Will this information be useful to you?

Q4. Where do you think you will use the information from this seminar?

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

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SCENARIO FOR CREATING A TO-DO LIST

It is Friday morning at 8:00 am. All tasks must be completed by 8:00 am on Monday.

The following tasks must be accomplished. Create a to-do list in priority order.

- Go to school from 9:00 am to 3:00 pm on Friday.
- Work from 6:00 pm to 9:00 pm on Saturday night.
- Pick up your sister from ballet on Sunday at 1:00 pm.
- Clean your room.
- Polish your boots.
- Take out the garbage.
- Make a lesson plan for cadets on Monday night.
- Go to a movie.
- Hang out with your friends.
- Cut the lawn.
- Do your homework which includes a 1 000 word essay, four math problems, and reading two chapters of your history text.
- Play basketball on Saturday.
- Update your resume.
- Have supper at your grandparents on Sunday.
- Study for final exams.
- Eat meals.
- Sleep at least eight hours a night.
- Work out with weights.

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LEADERSHIP SEMINAR
COMMUNICATIONS

Total Time:	90 min

PREPARATION

Photocopy Appendices 1 and 3 to Attachment D for each cadet.

Photocopy Appendices 2 to Attachment D.

The following components are conducted during this seminar:

Number	Component	Time
1	Have cadets participate in a communication exercise.	15 min
2	Conduct a group discussion on the communications exercise.	5 min
3	Demonstrate and explain how to build rapport using a role-play scenario.	20 min
4	Explain reading body language.	15 min
5	Conduct an activity where cadets read negative and positive body language.	20 min
6	Conduct a group discussion on the communications seminar.	5 min

HAVE CADETS PARTICIPATE IN A COMMUNICATION EXERCISE

ACTIVITY

Time: 15 min

OBJECTIVE

The objective of this activity is to have the cadets give and receive instructions without non-verbal cues.

RESOURCES

- Figures located at Appendix 1 to Attachment D,
- Paper, and
- Pens / pencil.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Have the cadets find a partner.
2. Have the cadets sit back-to-back.
3. Distribute paper and pen / pencil to each cadet.
4. Distribute picture A to one cadet and picture B to the other cadet.

5. Have the first cadet describe and give instructions to the other cadet to reproduce picture A. The cadet receiving instructions cannot ask for clarification; they may only ask for repetition.

6. Allow the first cadet seven minutes to complete the instructions.

7. Have the other cadet describe and give instructions to the first cadet to reproduce picture B. The cadet receiving instructions cannot ask for clarification; they may only ask for repetition.

8. Allow the second cadet seven minutes to complete the instructions.

9. Have each cadet exchange pictures.

SAFETY

Nil.

CONDUCT A GROUP DISCUSSION ON THE COMMUNICATIONS EXERCISE

Time: 5 min

The purpose of the group discussion is to have cadets practice reflective thinking skills. Use the tips for answering / facilitating discussion and the suggested questions provided.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. How did you feel about giving instructions? Were your instructions to the point?

Q2. How did you feel about receiving instructions? Could the instructions you were given be more clear?

Q3. Which was more difficult, giving or receiving instruction? Why?

Q4. Would this exercise have been easier if you could see your partner? Why or why not?

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

DEMONSTRATE AND EXPLAIN HOW TO BUILD RAPPORT USING A ROLE-PLAY SCENARIO

BACKGROUND KNOWLEDGE

BUILDING RAPPORT

Rapport builds naturally over time with cadets who are trusted and who are believable. The process of building rapport can be sped up by matching and mirroring the other cadet's verbal and non-verbal communications.

Matching Body Language

Matching body language can take several forms. One may match the other cadet's whole body position, the position of the upper or lower half of their body, or the angle of their head and shoulder. Matching may also be done by using the cadet's same type and rate of movement and gestures. One may match things exactly or partially.

Matching Voice

Matching may also be done using the other cadet's voice. One may match their volume, speed, pitch, rhythm, inflections and pauses. One may match their type of language and vocabulary and speech patterns.

Matching Energy

One may match the other cadet's energy level also. One may match how rapidly they breathe and whether they breathe using shallow or deep breaths.

Mirroring

Instead of matching the cadet's body movements, one may mirror them. When the cadet crosses their right leg over their left, one may cross their left leg over their right.

The idea of building rapport through matching and mirroring is not to copy blindly every movement a cadet makes or each body position they sit in. Building rapport is something that is done "with" a cadet, not "to" a cadet.

ACTIVITY

Time: 20 min

When conducting the role-play, take the part of a mentor. Ensure when acting as the mentor during the role-play to use matching and mirroring techniques.

OBJECTIVE

The objective of this activity is to have the cadets see communications that build rapport using a role-play scenario.

RESOURCES

- Role-play scenario located at Appendix 2 to Attachment D,
- Paper,
- Pen/ pencil.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Distribute paper and a pen / pencil to each cadet.
2. Ask cadets to volunteer to take part in the role-play.
3. Select one cadet to take part in the role-play.
4. Distribute the role-play scenario to the selected cadet.
5. Ask all other cadets to write down their observations about the role-play scenario.
6. Conduct the role-play scenario with the selected cadet.
7. After eight minutes, conclude the role-play scenario.
8. Have the rest of the cadets share their observations about the scenario. Ensure the cadets give examples for their observations.
9. Describe the matching and mirroring techniques that were used during the role-play scenario.

SAFETY

Nil.

EXPLAIN READING BODY LANGUAGE

Time: 15 min

Body language reveals a cadet's true thoughts. It may forewarn problems, such as lack of understanding, disagreement or conflict. It may signal support, agreement or encouragement. It may show how comfortable a cadet is with what is being said or how committed they really are to their own words.

Reading Other's Body Language

Most people understand body language intuitively and quickly, and the conclusions that are reached go straight into the subconscious. However, it pays to look out for certain positive and negative signals. If other's body language is read correctly, one should know whether one's communications are succeeding or missing their mark.

The Signal	What it may say
Nodding the head.	This cadet is listening to me. This cadet agrees with me.
Scratching the neck or rubbing eyes and looking at the ceiling (female) or the floor (man).	This cadet may not be telling the truth.
Clenched hands.	This cadet is frustrated.
Hand on cheek.	This cadet has some doubts.
Hand on cheek with thumb under chin.	This cadet is interested but has some doubts.
Picking off imaginary lint.	This cadet disagrees with or disproves of what has been said but is not willing to say so.
Crossed arms and legs.	This cadet is tuning out or filtering what is being said.

One must be careful of a cadet's unspoken messages. Crossed arms may say "I feel threatened by what you are saying and I am closed to hearing it", but it may also say "I'm cold". A tapping foot may mean "I would like to be on my way", but it may also reflect a lot of nervous energy or a need to go to the washroom.

Look Out for Negative Signals

A cadet's body language may serve as an early warning signal that something is amiss in the communication process. Negative signals include:

Boredom may look like:

- feet pointing away from the speaker;
- tapping feet;
- rapidly nodding the head;
- covering the nose;
- rubbing or scratching the neck or nose;
- looking skyward;
- avoiding or limiting eye contact;
- covering the mouth;
- body orienting away from the speaker;
- tense posture;
- covering or rubbing of the ears;
- "dancing" around;
- forming a fist, clenching the hands;
- rapidly exhaling breath;
- fidgeting (eg, tapping a pencil);
- drumming the fingers on the table; and
- buttoning the coat or jacket.

Boredom may look like:

- doodling;
- drumming the fingers;
- crossed legs with the foot swinging or kicking;
- head held in hands;
- a blank stare;
- taking deep breaths;
- tapping the floor with the foot; and
- clicking a pen in and out.

Frustration may look like:

- short breaths;
- "tssk" sounds;
- hands tightly clenched;
- fist-like gestures;
- wringing hands;
- pointing index fingers;
- running hands through the hair;
- rubbing the back of the neck; and
- kicking the ground at an imaginary object.

Look Out for Positive Signals

Just as body language may alert one to looming problems, it may also herald success. Positive signals include:

- nodding thoughtfully;
- relaxed posture;
- body oriented toward the speaker;
- open hands;
- feet pointed towards the speaker;
- stroking of the chin;
- open body position;
- eye contact, particularly when the pupils are dilated (enlarged);
- handling the documents or materials one is presenting; and
- thoughtful "um-hums".

Cooperation may look like:

- open hands;
- sitting on the edge of the chair;
- unbuttoning the coat or jacket;
- tilted head;
- leaning toward the speaker; and
- moving closer to the speaker.

Evaluation may look like:

- hand-to-face gestures;
- tilted head;
- stroking the chin or chin in the palm of the hand;
- taking their glasses off to clean them;
- sucking on a pen or glasses' arm; and
- peering over their glasses.

Distribute Appendix 3 to Attachment D to each cadet.

CONDUCT AN ACTIVITY WHERE CADETS READ NEGATIVE AND POSITIVE BODY LANGUAGE

Time: 20 min

OBJECTIVE

The objective of this activity is to have the cadets read negative and positive body language.

RESOURCES

Nil.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Have cadets select a partner.
2. Select one set of partners to go first.
3. Have one cadet act as the sender while the other cadet acts as the receiver of the information.
4. Have the receiver select one body language signal to display throughout the sender's presentation.
5. Have the sender tell the receiver about everything they have done during the previous week.
6. Have the receiver display the body language selected throughout the sender's presentation.
7. Have the sender talk for approximately two minutes.
8. Have the sender guess what body language was being displayed.
9. Have the rest of the class guess what body language was being displayed.
10. Have the receiver confirm or deny the guesses. If the guesses were not correct, have the receiver explain what body language was being displayed.
11. Repeat Steps 5–10 until each set of partners has been both the sender and the receiver.

SAFETY

Nil.

CONDUCT A GROUP DISCUSSION ON THE COMMUNICATIONS SEMINAR

Time: 5 min

The purpose of the group discussion is to have cadets practice reflective thinking skills. Use the tips for answering / facilitating discussion and the suggested questions provided.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. What have you learned during this seminar?

Q2. Which activities did you enjoy during the seminar? Why?

Q3. Will this information be useful to you?

Q4. Where do you think you will use the information from this seminar?

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

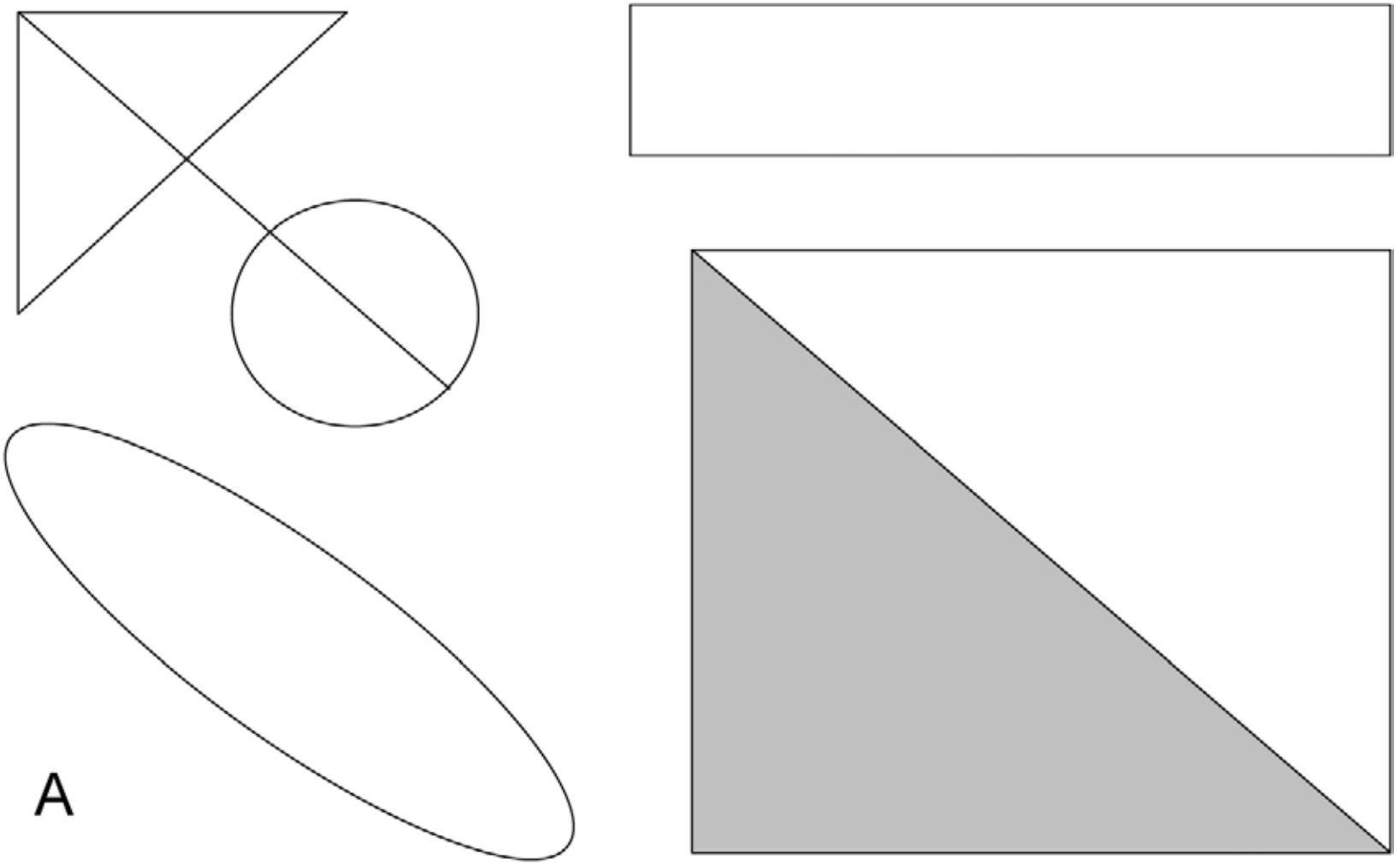

Figure D1-1 Picture A

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence

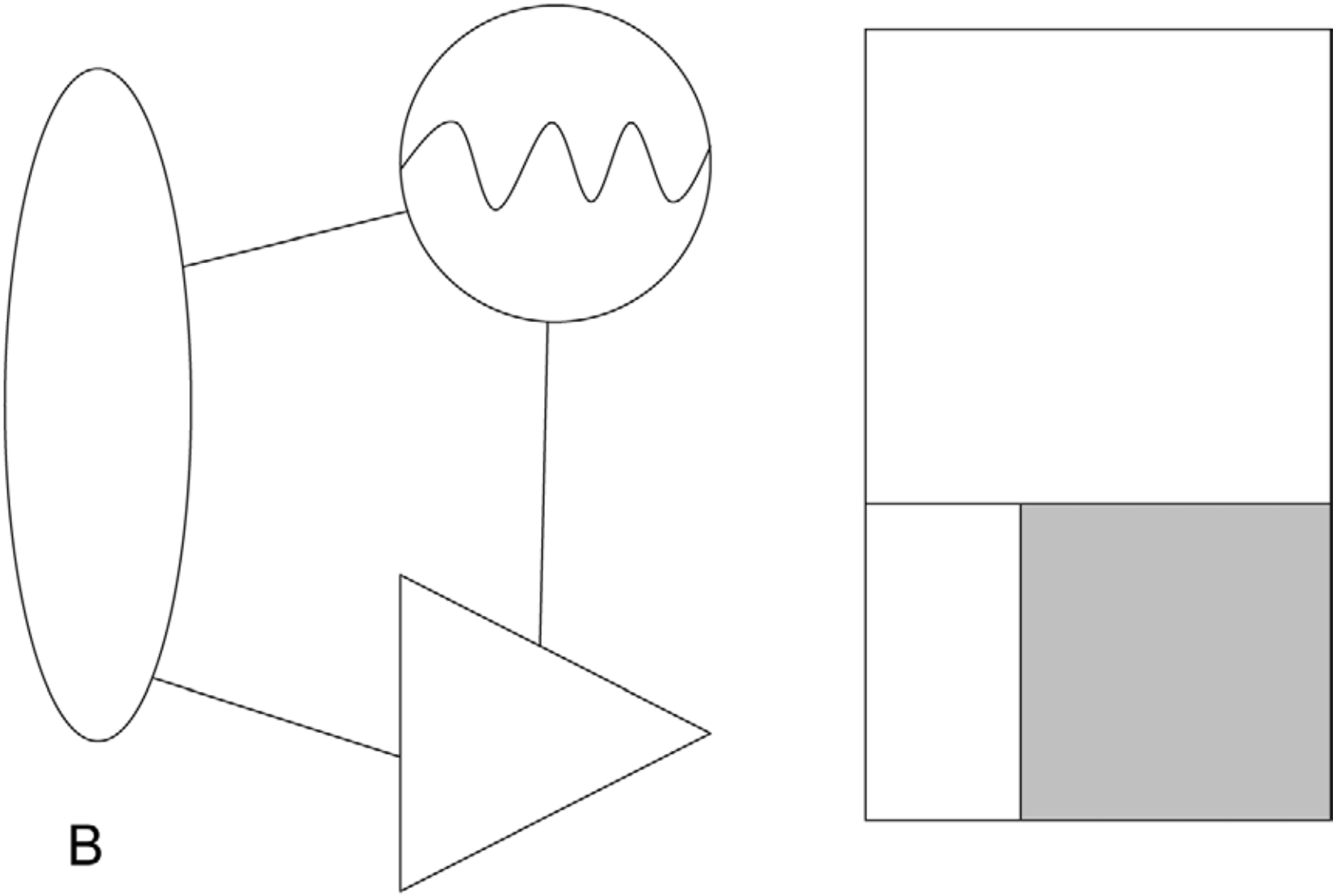

Figure D1-2 Picture B

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence

SCENARIO FOR ROLE-PLAY

You are a second year cadet who is often timid and shy. You are often late to parade nights and you do not take care of your uniform very well. You attended the General Training (GT) course last summer and this summer you wish to attend the three-week Basic Musician Course.

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READING BODY LANGUAGE

Body language reveals a cadet's true thoughts. It may forewarn problems, such as lack of understanding, disagreement or budding conflict. It may signal support, agreement or encouragement. It may show how comfortable a cadet is with what is being said or how committed they really are to their own words.

Reading Other's Body Language

Most people understand body language intuitively and quickly, and the conclusions that are reached go straight into the subconscious. However, it pays to look out for certain positive and negative signals. If other's body language is read correctly, one should know whether one's communications are succeeding or missing their mark.

The Signal	What it may say
Nodding the head.	This cadet is listening to me. This cadet agrees with me.
Scratching the neck or rubbing eyes and looking at the ceiling (female) or the floor (man).	This cadet may not be telling the truth.
Clenched hands.	This cadet is frustrated.
Hand on cheek.	This cadet has some doubts.
Hand on cheek with thumb under chin.	This cadet is interested but has some doubts.
Picking off imaginary lint.	This cadet disagrees with or disproves of what has been said but is not willing to say so.
Crossed arms and legs.	This cadet is tuning out or filtering what is being said.

One must be careful of a cadet's unspoken messages. Crossed arms may say "I feel threatened by what you are saying and I am closed to hearing it", but it may also say "I'm cold". A tapping foot may mean "I would like to be on my way", but it may also reflect a lot of nervous energy or a need to go to the washroom.

Look Out for Negative Signals

A cadet's body language may serve as an early warning signal that something is amiss in the communication process. Negative signals include:

- feet pointing away from the speaker;
- tapping feet;
- rapidly nodding the head;
- covering the nose;
- rubbing or scratching the neck or nose;
- looking skyward;
- avoiding or limiting eye contact;
- covering the mouth;
- body orienting away from the speaker;
- tense posture;
- covering or rubbing of the ears;
- "dancing" around;
- forming a fist, clenching the hands;
- rapidly exhaling breath;
- fidgeting (eg, tapping a pencil);
- drumming the fingers on the table; and
- buttoning the coat or jacket.

Boredom may look like:

- doodling;
- drumming the fingers;
- crossed legs with the foot swinging or kicking;
- head held in hands;
- a blank stare;
- taking deep breaths;
- tapping the floor with the foot; and
- clicking a pen in and out.

Frustration may look like:

- short breaths;
- "tssk" sounds;
- hands tightly clenched;
- fist-like gestures;
- wringing hands;
- pointing index fingers;
- running hands through the hair;
- rubbing the back of the neck; and
- kicking the ground at an imaginary object.

Look Out for Positive Signals

Just as body language may alert one to looming problems, it may also herald success. Positive signals include:

- nodding thoughtfully;
- relaxed posture;
- body oriented toward the speaker;
- open hands;
- feet pointed towards the speaker;
- stroking of the chin;
- open body position;
- eye contact, particularly when the pupils are dilated (enlarged);
- handling the documents or materials one is presenting; and
- thoughtful "um-hums".

Cooperation may look like:

- open hands;
- sitting on the edge of the chair;
- unbuttoning the coat or jacket;
- tilted head;
- leaning toward the speaker; and
- moving closer to the speaker.

Evaluation may look like:

- hand-to-face gestures;
- tilted head;
- stroking the chin or chin in the palm of the hand
;
- taking their glasses off to clean them;
- sucking on a pen or glasses' arm; and
- peering over their glasses.

LEADERSHIP SEMINAR
SUPERVISION

Total Time:	90 min

PREPARATION

Photocopy Appendices 1 and 2 to Attachment E for each cadet.

The following components are conducted during this seminar:

Number	Component	Time
1	Describe supervision systems.	10 min
2	Explain how to supervise effectively.	15 min
3	Conduct a group discussion on supervision.	25 min
4	Conduct an activity where cadets create a supervision plan based on a scenario.	25 min
5	Conduct a group discussion on the supervision seminar.	5 min

DESCRIBE SUPERVISION SYSTEMS

Time: 10 min

In general, the system of supervision will vary according to:

- the type of activity,
- the location of the activity,
- the age and skill of cadets, and
- the age and skill of the team leader / supervisor.

An assessment of the situation will determine the most appropriate supervision system to ensure the safety of cadets. The following systems may be used to cater to various situations.

Direct and Constant Supervision

Some activities require direct and constant supervision by a team leader to ensure all cadets remain safe. To determine whether direct and constant supervision is required, an assessment must be made on the level or risk involved in the activity and the skills and development of the cadets participating in the activity.

Intermittent Supervision

Intermittent supervision is appropriate for the supervision of more mature, responsible cadets participating in low-risk activities. Intermittent supervision must be well planned. The expectations for the cadets must be clearly stated and the cadets must be checked regularly.

Area Supervision

Area supervision requires a team leader to take responsibility for a particular area such as a basketball court or dining area. Area supervision allows cadets to move freely between areas and is easy to manage and plan.

Group Supervision

Group supervision relates to the supervision of a group of cadets regardless of the area they are in. Group supervision is more useful on excursions to venues where it is more difficult to supervise a large group of cadets or allow cadets to be grouped according to interest or skill level.

Floater Supervision

Floater supervision refers to a system where a team leader moves among all areas supporting and encouraging cadets and staff. The floater keeps track of the big picture and does not monitor a specific area or activity.

EXPLAIN HOW TO SUPERVISE EFFECTIVELY

Time: 15 min

Being totally aware of what is happening around and beyond a specific activity requires the development of specific supervision skills. These skills include:

- scanning;
- positioning;
- listening; and
- being "with it".

Scanning

Scanning involves regularly glancing around the whole area to see what is happening. By continually scanning the area, the team leader is able to quickly intervene in a situation where cadets could be at risk or intervene in a dispute.

Positioning

The physical position that the team leader takes will determine how well the team leader is able to supervise the cadets in their vicinity. Always position the body to be able to observe the maximum area possible. If the team leader is responsible for a high-risk activity, they must never leave the activity.

Listening

As well as positioning and scanning the area, the team leader will need to listen carefully to what is happening. As the team leader listens to cadets, they will learn the sounds that indicate that all is well or sounds that indicate something is not right.

Being "With It"

Being "with it" is the key to any supervision system. It is the desire and ability to be aware of:

- what has happened in the past;
- what is happening in the present; and
- what is likely to happen in the future.

Being "with it" requires the team leader to know the cadets in their care and monitor what they are doing. This includes all cadets' range of skills, interests, and their ability to interact with others. Being "with it" may enable the team leader to be aware of the positive behaviour displayed by cadets. The team leader may notice the leadership, perseverance, cooperation, and kindness of cadets.

Distribute Appendix 1 to Attachment E to each cadet.

CONDUCT A GROUP DISCUSSION ON SUPERVISION

Time: 25 min

The purpose of the group discussion is to have cadets practice reflective thinking skills. Use the tips for answering / facilitating discussion and the suggested questions provided.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. Name some locations around the squadron where the cadets will need to be supervised in the building?

Q2. How do you supervise these areas?

Q3. Is supervision of cadets different in the classroom than in the rest of the building? Why or why not?

Q4. Is supervision of cadets different in the canteen than in the rest of the building? Why or why not?

Q5. Is supervision of cadets different on the range than in the rest of the building? Why or why not?

Q6. How will you supervise the areas in the rest of the building (eg, washrooms, stairs, hallways)?

Q7. Is supervision of cadets different when cadets are participating in an outdoor activity (eg, sailing, expedition, or launching rockets)?

Q8. Give some examples of how and why the supervision is different?

Q9. How does supervision lower the risks of those activities?

Q10. Can supervision duties be delegated to others? Why or why not?

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

CONDUCT AN ACTIVITY WHERE CADETS CREATE A SUPERVISION PLAN BASED ON A SCENARIO

Time: 25 min

OBJECTIVE

The objective of this activity is to have the cadets create a supervision plan based on a scenario.

RESOURCES

- Scenario located at Appendix 2 to Attachment E,
- Paper, and
- Pen / pencil.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Have the cadets find a partner.
2. Distribute the scenario to each pair of cadets.
3. Allow the cadets 15 minutes to create their supervision plan.
4. Have each pair present their supervision plan to the other cadets.
5. Allow one minute for questions and answers.

SAFETY

Nil.

CONDUCT A GROUP DISCUSSION ON THE SUPERVISION SEMINAR

Time: 5 min

The purpose of the group discussion is to have cadets practice reflective thinking skills. Use the tips for answering / facilitating discussion and the suggested questions provided.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. What have you learned during this seminar?

Q2. Which activities did you enjoy during the seminar? Why?

Q3. Will this information be useful to you?

Q4. Where do you think you will use the information from this seminar?

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

SUPERVISION SYSTEMS

In general, the system of supervision will vary according to:

- the type of activity,
- the location of the activity,
- the age and skill of cadets, and
- the age and skill of the team leader / supervisor.

An assessment of the situation will determine the most appropriate supervision system to ensure the safety of cadets. The following systems may be used to cater to various situations.

Direct and Constant Supervision

Some activities require direct and constant supervision by a team leader to ensure all cadets remain safe. To determine whether direct and constant supervision is required, an assessment must be made on the level or risk involved in the activity and the skills and development of the cadets participating in the activity.

Intermittent Supervision

Intermittent supervision is appropriate for the supervision of more mature, responsible cadets participating in low-risk activities. Intermittent supervision must be well planned. The expectations for the cadets must be clearly stated and the cadets must be checked regularly.

Area Supervision

Area supervision requires a team leader to take responsibility for a particular area such as a basketball court or dining area. Area supervision allows cadets to move freely between areas and is easy to manage and plan.

Group Supervision

Group supervision relates to the supervision of a group of cadets regardless of the area they are in. Group supervision is more useful on excursions to venues where it is more difficult to supervise a large group of cadets or allow cadets to be grouped according to interest or skill level.

Floater Supervision

Floater supervision refers to a system where a team leader moves among all areas supporting and encouraging cadets and staff. The floater keeps track of the big picture and does not monitor a specific area or activity.

HOW TO SUPERVISE EFFECTIVELY

Being totally aware of what is happening around and beyond a specific activity requires the development of specific supervision skills. These skills include:

- scanning;
- positioning;
- listening; and
- being "with it".

Scanning

Scanning involves regularly glancing around the whole area to see what is happening. By continually scanning the area, the team leader is able to quickly intervene in a situation where cadets could be at risk or intervene in a dispute.

Positioning

The physical position that the team leader takes will determine how well the team leader is able to supervise the cadets in their vicinity. Always position the body to be able to observe the maximum area possible. If the team leader is responsible for a high-risk activity, they must never leave the activity.

Listening

As well as positioning and scanning the area, the team leader will need to listen carefully to what is happening. As the team leader listens to cadets, they will learn the sounds that indicate that all is well or sounds that indicate something is not right.

Being "With It"

Being "with it" is the key to any supervision system. It is the desire and ability to be aware of:

- what has happened in the past;
- what is happening in the present; and
- what is likely to happen in the future.

Being "with it" requires the team leader to know the cadets in their care and monitor what they are doing. This includes all cadets' range of skills, interests, and their ability to interact with others. Being "with it" may enable the team leader to be aware of the positive behaviour displayed by cadets. The team leader may notice the leadership, perseverance, cooperation, and kindness of cadets.

SCENARIO FOR SUPERVISION PLAN

Your squadron is going on a weekend citizenship tour. The squadron will travel by bus approximately 150 kilometres. The bus will depart Saturday morning at 8:00 am. The first stop for the squadron will be a museum. Lunch will occur at 12:00 pm on site at the museum. The bus will depart the museum and travel to a restaurant for supper at 4:30 pm. The bus will depart the fast food restaurant after one hour to drive to the armoury. The squadron will spend the night sleeping in the armoury. On Sunday morning, breakfast will be brought to the armoury at 08:30 am. The bus will depart the armoury at 10:00 am to drive to a mall. Cadets will have lunch in the mall at the food court. The bus will depart the mall at 2:30 pm to return home.

The squadron will take 15 first year cadets, 10 second year cadets, 7 third year cadets, 4 fourth year cadets, and 2 fifth year cadets. There will be 6 adult supervisors: 4 officers and 2 Civilian Instructors.

Create a supervision plan for the weekend activity using third, fourth and fifth year cadets. Adult supervisors may also be used.

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COMMON TRAINING

ALL TRAINING LEVELS

INSTRUCTIONAL GUIDE

PERSONAL FITNESS AND HEALTHY LIVING

SECTION 1

PO X04 – TRACK PARTICIPATION IN PHYSICAL ACTIVITIES

Total Time:

For the following EOs, refer to the lesson specifications located in A-CR-CCP-801/PG-001, *Royal Canadian Air Cadets Proficiency Level One Qualification Standard and Plan*:

- CX04.01 – Participate in the Cadet Fitness Assessment and Identify Strategies for Improving Personal Physical Fitness,
- CX04.03 – Participate in a Cooking Class,
- CX04.04 – Attend a Personal Fitness and Healthy Living Presentation, and
- CX04.05 – Attend a Local Amateur Sporting Event.

For the following EOs, refer to the instructional guides located in A-CR-CCP-801/PF-001, *Royal Canadian Air Cadets Proficiency Level One Instructional Guides*:

- MX04.01 – Participate in 60 Minutes of Moderate- to Vigorous-Intensity Physical Activity (MVPA) and Track Participation in Physical Activities,
- MX04.02 – Identify Strategies to Improve Participation in Physical Activities and Participate in the Cadet Fitness Assessment,
- MX04.03 – Participate in the Cadet Fitness Assessment and Identify Strategies for Improving Personal Physical Fitness, and
- CX04.02 – Participate in Activities that Reinforce the Three Components of Physical Fitness.

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COMMON TRAINING

ALL TRAINING LEVELS

INSTRUCTIONAL GUIDE

PHYSICAL ACTIVITIES

SECTION 1

PO X05 – PARTICIPATE IN PHYSICAL ACTIVITIES

Total Time:

For the following EOs, refer to the instructional guides located in A-CR-CCP-801/PF-001, *Royal Canadian Air Cadets Proficiency Level One Instructional Guides*:

- MX05.01 – Participate in Physical Activities,
- CX05.01 – Participate in Physical Activities, and
- CX05.02 – Participate in a Tournament.

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 1

EO M406.01 – PARTICIPATE IN A RECREATIONAL MARKSMANSHIP ACTIVITY

Total Time: 90 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content, unit range standing orders, and become familiar with the material prior to delivering the lesson.

Photocopy the targets located at Attachments B–J as required.

Construct a range IAW A-CR-CCP-177/PT-001, *Canadian Cadet Movement: Cadet Marksmanship Program Reference Manual*.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

A practical activity was chosen for this lesson as it is an interactive way to allow the cadets to experience recreational marksmanship in a safe and controlled environment. This activity contributes to the development of marksmanship skills and knowledge in a fun and challenging setting.

INTRODUCTION

REVIEW

The review for this lesson will be from EO M106.02 (Carry Out Safety Precautions on the Cadet Air Rifle).

QUESTIONS:

Q1. Why do we follow safety regulations?

Q2. How would you verify the safety catch is ON?

Q3. What are the four “ACTS” of firearm safety?

ANTICIPATED ANSWERS:

A1. We follow safety regulations to prevent accidents with the cadet air rifle.

A2. When the safety is ON, no red can be seen.

A3. The mnemonic “ACTS” stands for:

- Assume every firearm is loaded.
- Control the muzzle direction at all times.
- Trigger finger must be kept off the trigger and out of the trigger guard.
- See that the firearm is unloaded (prove it safe).

OBJECTIVES

By the end of this lesson the cadet shall have participated in a recreational marksmanship activity.

IMPORTANCE

It is important for cadets to participate in a recreational marksmanship activity because it allows them to experience marksmanship in a fun, dynamic and safe setting.

Teaching Point 1 **Supervise the cadet's participation in a recreational marksmanship activity.**

Time: 80 min Method: Practical Activity

A range briefing is conducted to pass on vital information and answer any questions the cadets may have prior to participating in a marksmanship activity. The range briefing is required to ensure the safe execution of a marksmanship activity.

CONDUCT A RANGE BRIEFING

1. Explain pertinent sections of the local range standing orders.
2. Review general rules observed on all ranges, to include:
   a. proving that rifles are safe prior to being picked up, handed to or received from another person;
   b. never pointing rifles at people;
   c. inserting safety rods into the barrels of rifles when not in use on the range;
   d. never horseplaying on a range;
   e. always pointing rifles down range; and
   f. following the Range Safety Officer's (RSO) directions and orders at all times.

Review range commands with an explanation and demonstration for each command.

All loading / firing is to be simulated.

3. Review commands used on an air rifle range (as illustrated in Figure 1).

COMMAND	ACTION TO BE TAKEN
Cover off your firing point	Stand up, move behind the firing point and await further commands.
Place your equipment down and stand back	Lay the equipment down on the mat and stand back when finished.
Adopt the prone position	Adopt the prone position, pick up the rifle, ready the equipment and put on hearing and eye protection.
Type of firing (GRIT)	GRIT is the acronym for: 1. Group (relay), 2. Range (distance), 3. Indication (number of rounds), and 4. Type (grouping, scored).

COMMAND	ACTION TO BE TAKEN
Relay, load	1. Pick up and hold the rifle with the dominant hand. 2. Ensure the safety catch is in the “ON” position. 3. Pump the rifle, observing a three-second pause. 4. Load a pellet (flat end forward). 5. Close the bolt.
Relay, fire	1. Place the safety catch in the “OFF” position. 2. Aim the rifle at the target. 3. Squeeze the trigger. 4. Open the bolt. 5. Repeat the following sequence for each shot: a. Pump the rifle, observing a three-second pause. b. Load a pellet (flat end forward). c. Close the bolt. d. Aim the rifle at the target. e. Squeeze the trigger. f. Open the bolt. 6. Place the safety in the “ON” position. 7. Partially open the pump lever. 8. Lay down the rifle.

Figure 1 Air Rifle Range Commands

Note. Created by Director Cadets 3, 2006, Ottawa, ON: Department of National Defence.

4. Describe the layout of the air rifle range.

5. Review hand-washing procedures on completion of firing. This is important because each time a person handles pellets, a small trace of lead is left on their hands. To decrease the risk of lead poisoning, it is important that all persons wash their hands thoroughly after handling pellets.

ACTIVITY

OBJECTIVE

The objective of this activity is to have the cadets participate in a recreational marksmanship activity.

RESOURCES

- Cadet air rifle (one per firing lane),
- Cadet air rifle sling (one per cadet),
- Air rifle pellets (as per activity chosen),
- Target frames (one per firing lane),
- Targets (as per activity chosen),
- Shooting mats (one per firing lane),
- Safety glasses / goggles (10 pairs),

- Stopwatch, and
- Pen / pencil.

Additional resources required for specific marksmanship activities may be found in the Attachments.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Brief cadets on the safety rules or any other guidelines pertaining to the activity.
2. Divide the cadets into relays according to the number of firing lanes.
3. Conduct a recreational marksmanship activity, choosing from the following categories:
   a. classification (located at Attachment A),
   b. fun activities (located at Attachments B–E),
   c. timed activities (located at Attachments F–H), or
   d. competitive team / individual activities (located at Attachments I–J).

If EO C306.03 (Fire the Cadet Air Rifle From the Standing Position) has been taught prior to this marksmanship activity, this EO may be conducted in the standing position.

SAFETY

Range activities will be conducted IAW A-CR-CCP-177/PT-001, *Canadian Cadet Movement: Cadet Marksmanship Program Reference Manual*.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the activity will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' participation in the recreational marksmanship activity will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Marksmanship is a fun and exciting activity that requires personal discipline and teamwork skills. This activity has also developed into highly competitive levels at the provincial, regional, and national levels.

INSTRUCTOR NOTES / REMARKS

Hand-washing stations must be available for cleanup after the activity is completed.

Cadets may fire in the standing position if they have received the training associated with EO C306.03 (Fire the Cadet Air Rifle From the Standing Position).

Squadrons choosing to instruct EO C406.01 (Assist the Range Safety Officer) should allow cadets to fill these roles during air rifle marksmanship activities.

This activity provides opportunities for cadets to complete a leadership assignment as outlined in PO 403 (Act as a Team Leader).

REFERENCES

A0-027 A-CR-CCP-177/PT-001 Director Cadets 3. (2005). *Canadian cadet movement: Cadet marksmanship program reference manual*. Ottawa, ON: Department of National Defence.

A0-041 CATO 14-41 Director Cadets 4. (2007). *Marksmanship, rifles and ammunition*. Ottawa ON: Department of National Defence.

CLASSIFICATION ACTIVITY

CLASSIFICATION ACTIVITY

Objective: To provide cadets the opportunity to obtain marksmanship classifications.

Scoring: The standard for the classification levels are:

1. Marksman: Two five-round groupings within a circle of 3 cm in diameter.
2. First Class Marksman: Two five-round groupings within a circle of 2.5 cm in diameter.
3. Expert Marksman: Two five-round groupings within a circle of 2 cm in diameter.
4. Distinguished Marksman: Two five-round groupings within a circle of 1.5 cm in diameter.

Equipment Required:

Mandatory:

- CCT200GRTD Canadian Cadet Movement Air Rifle Grouping Target (one per cadet), and
- Air Rifle Grouping Template from *Canadian Cadet Movement: Cadet Marksmanship Program Reference Manual* (p. B1-1).

Optional aids to firing are limited to the following:

- Cadet air rifle sling,
- Marksmanship jacket,
- Shooting glove, and
- Hat.

Activity Instructions:

1. Distribute an Air Rifle Grouping Target to each cadet.
2. Have the cadets write their name and date on the target and attach it to the target frame.
3. Give the cadets five pellets to fire into the centre of the target.
4. Have the cadets fire, in relays, following the commands given by the RSO.
5. Give the cadets 15 minutes to complete firing.
6. Have the cadets retrieve their targets.
7. Score the targets using the Air Rifle Grouping Template.
8. Record the scores and allow the cadets to keep their targets.

The following are prohibited:

- Alterations made to the rifles,
- A pellet-loading clip,
- Supports used as a rest for the rifle or the forearm,
- A spotting scope,

- Use of sights not provided with the cadet air rifle, and
- Coaching.

FUN ACTIVITIES

PYRAMID

Objective: To fire pellets into each point on the pyramid.

Scoring: One point is awarded for each point on the pyramid that is hit by a pellet.

Equipment Required:

Mandatory: Pyramid Target (one per cadet).

Optional aids to firing are limited to the following:

- Cadet air rifle sling,
- Marksmanship jacket,
- Shooting glove, and
- Hat.

Activity Instructions:

1. Distribute one Pyramid Target to each cadet.
2. Have the cadets write their name and date on the target and attach it to the target frame.
3. Give the cadets three pellets to fire, one pellet into each corner of the pyramid.
4. Have the cadets fire, in relays, following the commands given by the RSO.
5. Give the cadets three minutes to complete firing.
6. Score the targets awarding one point for each corner hit on the pyramid.
7. Allow the cadets to review and keep their targets.

The following are prohibited:

- Alterations made to the rifles,
- A pellet-loading clip,
- Supports used as a rest for the rifle or the forearm,
- A spotting scope, and
- Use of sights not provided with the cadet air rifle.

PYRAMID TARGET

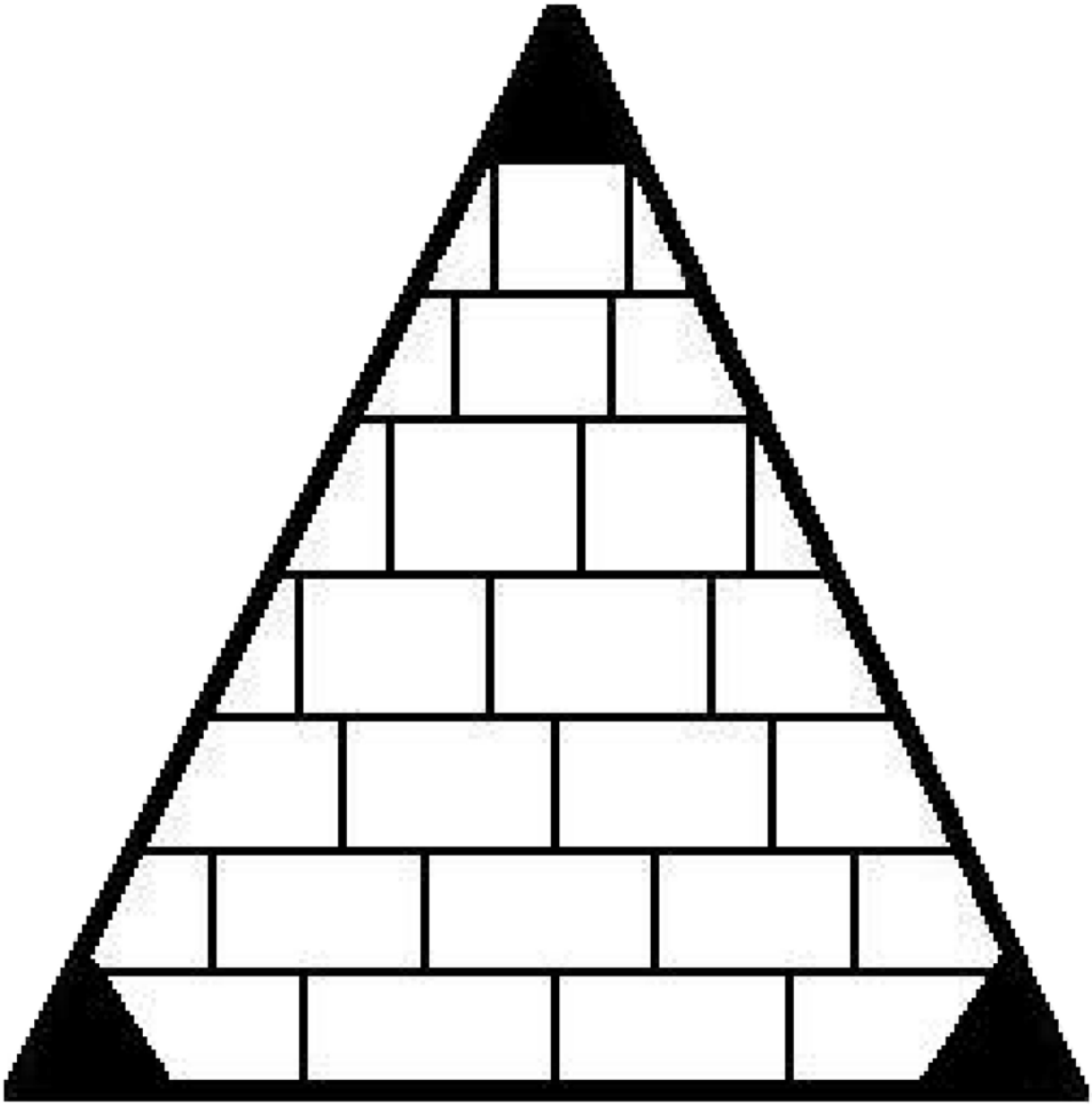

Figure B-1 Pyramid Target

Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.

Name: _____ Date: _____

FUN ACTIVITIES

SHOOTING STAR

Objective: To fire a pellet into each point on the star.

Scoring: One point is awarded for each point on the star that is hit by a pellet.

Equipment Required:

Mandatory: Star Target (one per cadet).

Optional aids to firing are limited to the following:

- Cadet air rifle sling,
- Marksmanship jacket,
- Shooting glove, and
- Hat.

Activity Instructions:

1. Distribute one Star Target to each cadet.
2. Have the cadets write their name and date on the target and attach it to the target frame.
3. Give the cadets five pellets to fire, one pellet into each point on the star.
4. Have the cadets fire, in relays, following the commands given by the RSO.
5. Give the cadets five minutes to complete firing.
6. Score the targets awarding one point for a pellet hit within each point on the star.
7. Allow the cadets to review and keep their targets.

The following are prohibited:

- Alterations made to the rifles,
- A pellet-loading clip,
- Supports used as a rest for the rifle or the forearm,
- A spotting scope, and
- Use of sights not provided with the cadet air rifle.

STAR TARGET

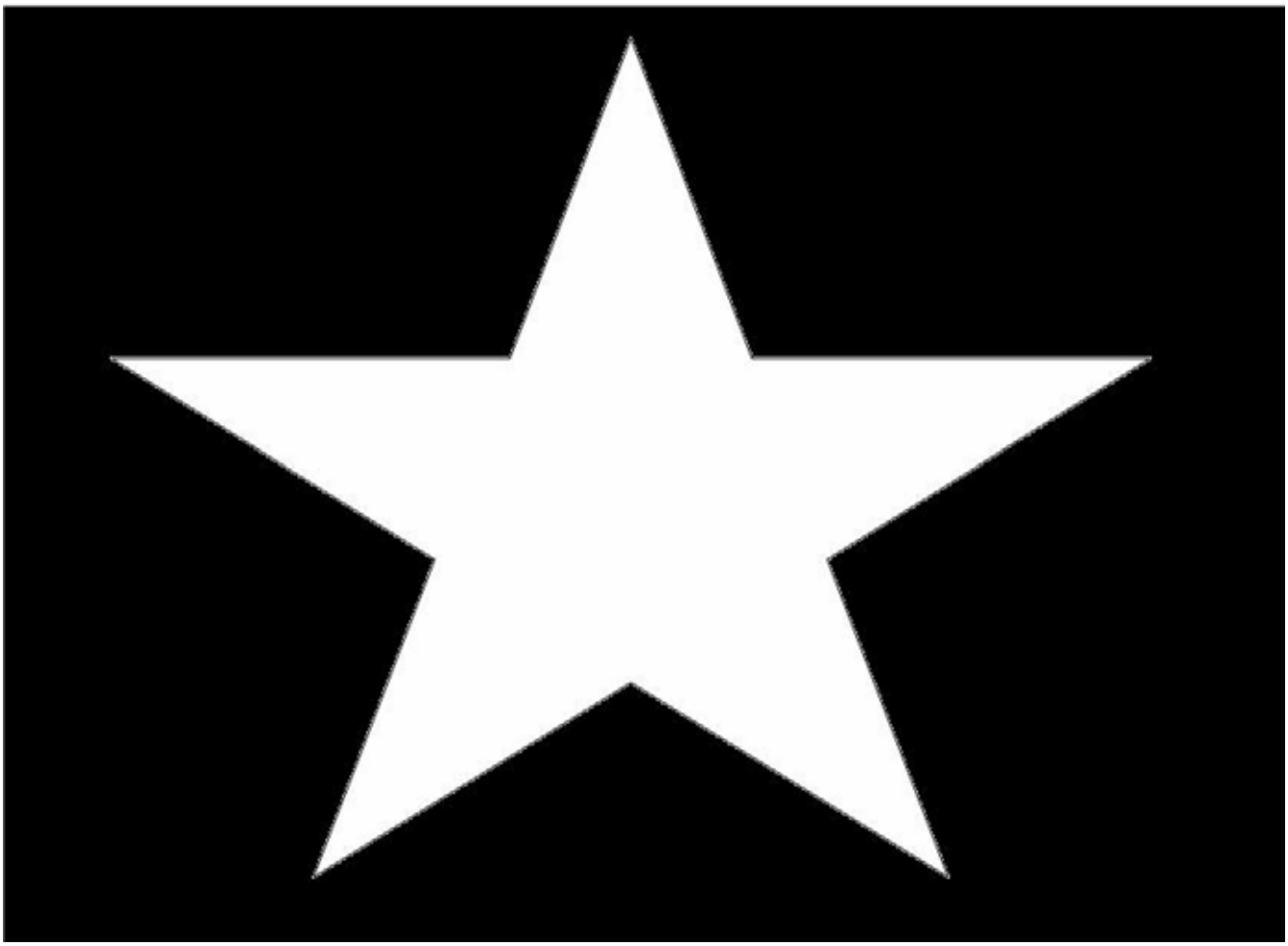

Figure C-1 Star Target

Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.

Name: _____ Date: _____

FUN ACTIVITIES

BEACH BALL

Objective: To fire 10 pellets into the black circle on the beach ball.

Scoring: One point is awarded for each successful hit in the black circle.

Equipment Required:

Mandatory: Beach Ball Target (one per cadet).

Optional aids to firing are limited to the following:

- Cadet air rifle sling,
- Marksmanship jacket,
- Shooting glove, and
- Hat.

Activity Instructions

1. Distribute one Beach Ball Target to each cadet.
2. Have the cadets write their name and date on the target and attach it to the target frame.
3. Give the cadets 10 pellets to fire into the black circle of the beach ball.
4. Have the cadets fire, in relays, following the commands given by the RSO.
5. Give the cadets 10 minutes to complete firing.
6. Score the targets awarding one point for each pellet hit within the black circle.
7. Allow the cadets to review and keep their targets.

The following are prohibited:

- Alterations made to the rifles,
- A pellet-loading clip,
- Supports used as a rest for the rifle or the forearm,
- A spotting scope, and
- Use of sights not provided with the cadet air rifle.

BEACH BALL TARGET

Figure D-1 Beach Ball Target

Note. Created by Director Cadets 3, 2006, Ottawa, ON: Department of National Defence.

Name: _____ Date: _____

FUN ACTIVITIES

BALLOONS

Objective: To fire pellets into balloons on the target.

Scoring: One point is awarded for each balloon hit by a pellet.

Equipment Required:

Mandatory: Balloon Target (one per cadet).

Optional aids to firing are limited to the following:

- Cadet air rifle sling,
- Marksmanship jacket,
- Shooting glove, and
- Hat.

Activity Instructions:

1. Distribute one Balloon Target to each cadet.
2. Have the cadets write their name and date on the target and attach it to the target frame.
3. Give the cadets five pellets to fire, one pellet into each balloon.
4. Have the cadets fire, in relays, following the commands given by the RSO.
5. Give the cadets five minutes to complete firing.
6. Score the targets awarding one point for each balloon hit.
7. Allow the cadets to review and keep their targets.

The following are prohibited:

- Alterations made to the rifles,
- A pellet-loading clip,
- Supports used as a rest for the rifle or the forearm,
- A spotting scope, and
- Use of sights not provided with the cadet air rifle.

Note: Actual balloons may be used in place of the paper targets.

BALLOON TARGET

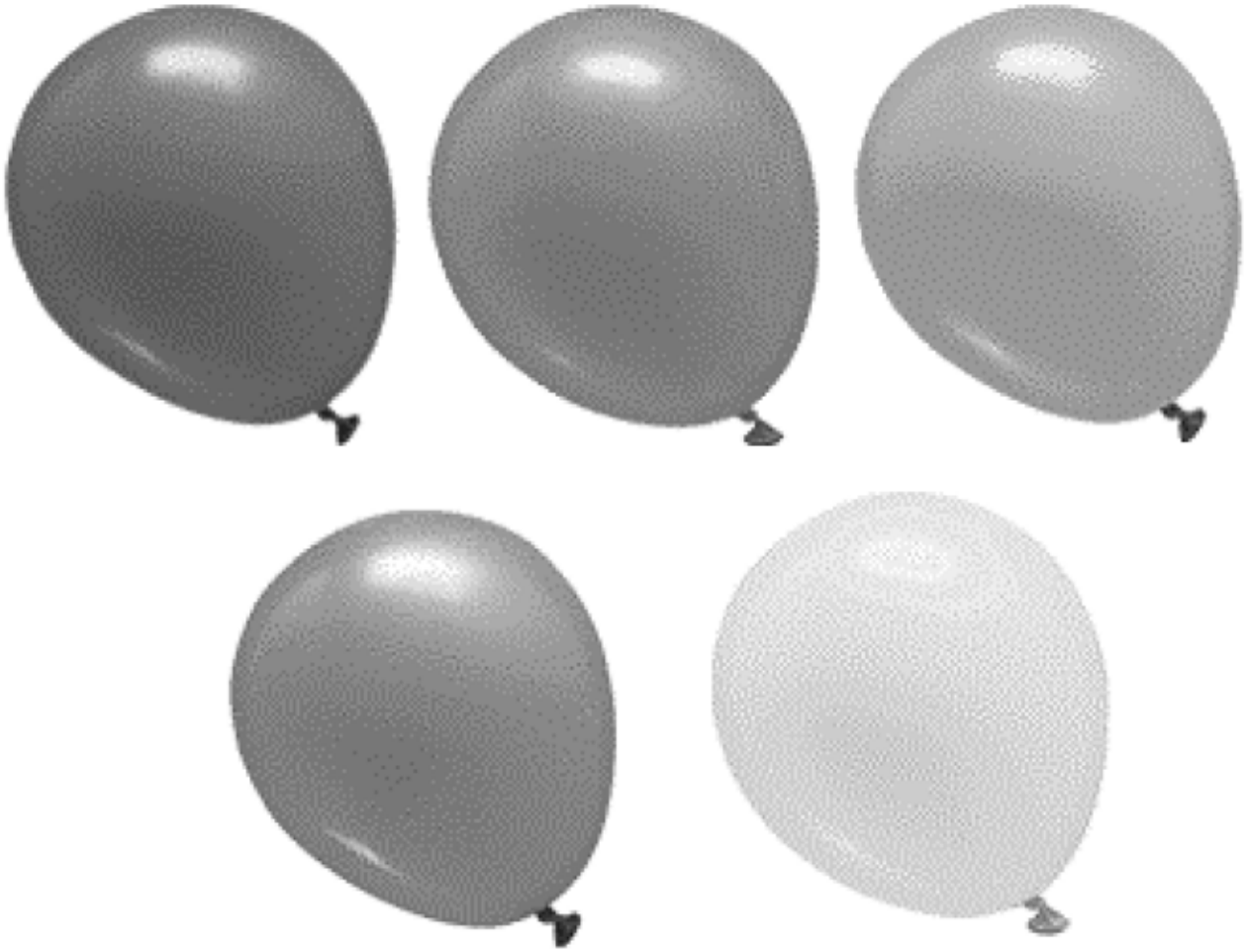

Figure E-1 Balloon Target

Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.

Name: _____ Date: _____

TIMED ACTIVITIES

CHASE THE DOTS

Objective: To fire pellets into the dots on the target in a clockwise direction, within a time limit.

Scoring: One point is awarded for each black dot that is hit by a pellet within the time allotted.

Equipment Required:

Mandatory: Chase the Dots Target (one per cadet).

Optional aids to firing are limited to the following:

- Cadet air rifle sling,
- Marksmanship jacket,
- Shooting glove, and
- Hat.

Activity Instructions:

1. Distribute one Chase the Dots Target to each cadet.
2. Have the cadets write their name and date on the target and attach it to the target frame.
3. Give the cadets eight pellets to fire, one pellet into each black dot, in a clockwise direction.
4. Have the cadets fire, in relays, following the commands given by the RSO.
5. Give the cadets eight minutes to complete firing.
6. Score the targets awarding one point for each black dot hit.
7. Allow the cadets to review and keep their targets.

The following are prohibited:

- Alterations made to the rifles,
- A pellet-loading clip,
- Supports used as a rest for the rifle or the forearm,
- A spotting scope,
- Use of sights not provided with the cadet air rifle, and
- Coaching.

Note: To make this activity more difficult, shorten the time allowance.

CHASE THE DOTS TARGET

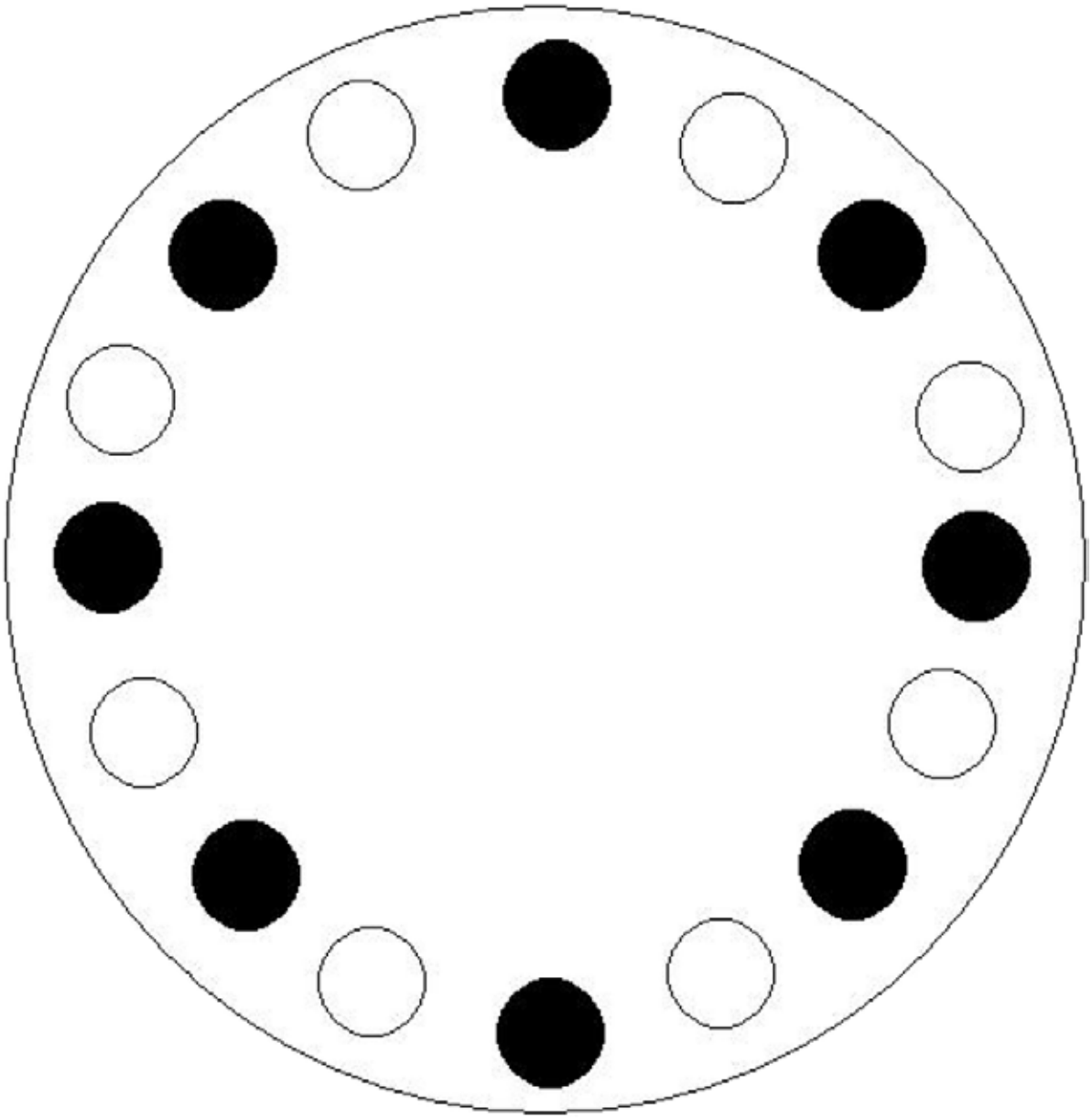

Figure F-1 Chase the Dots Target

Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.

Name: _____ Date: _____

TIMED ACTIVITIES

SPEED GRID

Objective: To fire pellets into the circles on the target, within a time limit.

Scoring: One point is awarded for each circle that is hit by a pellet within the time allotted.

Equipment Required:

Mandatory:

- Cadet air rifle five-pellet clip (three per firing lane), and
- Speed Grid Target (one per cadet).

Optional aids to firing are limited to the following:

- Cadet air rifle sling,
- Marksmanship jacket,
- Shooting glove, and
- Hat.

Activity Instructions:

1. Distribute one Speed Grid Target to each cadet.
2. Have the cadets write their name and date on the target and attach it to the target frame.
3. Give the cadets 15 pellets, pre-loaded into three five-pellet clips.
4. Have the cadets fire one pellet into each circle on the target.
5. Have the cadets fire, in relays, following the commands given by the RSO.
6. Give the cadets 15 minutes to complete firing.
7. Score the targets awarding one point for each circle hit.
8. Allow the cadets to review and keep their targets.

The following are prohibited:

- Alterations made to the rifles,
- Supports used as a rest for the rifle or the forearm,
- A spotting scope,
- Use of sights not provided with the cadet air rifle, and
- Coaching.

Note: To make this activity more difficult, shorten the time allowance.

SPEED GRID TARGET

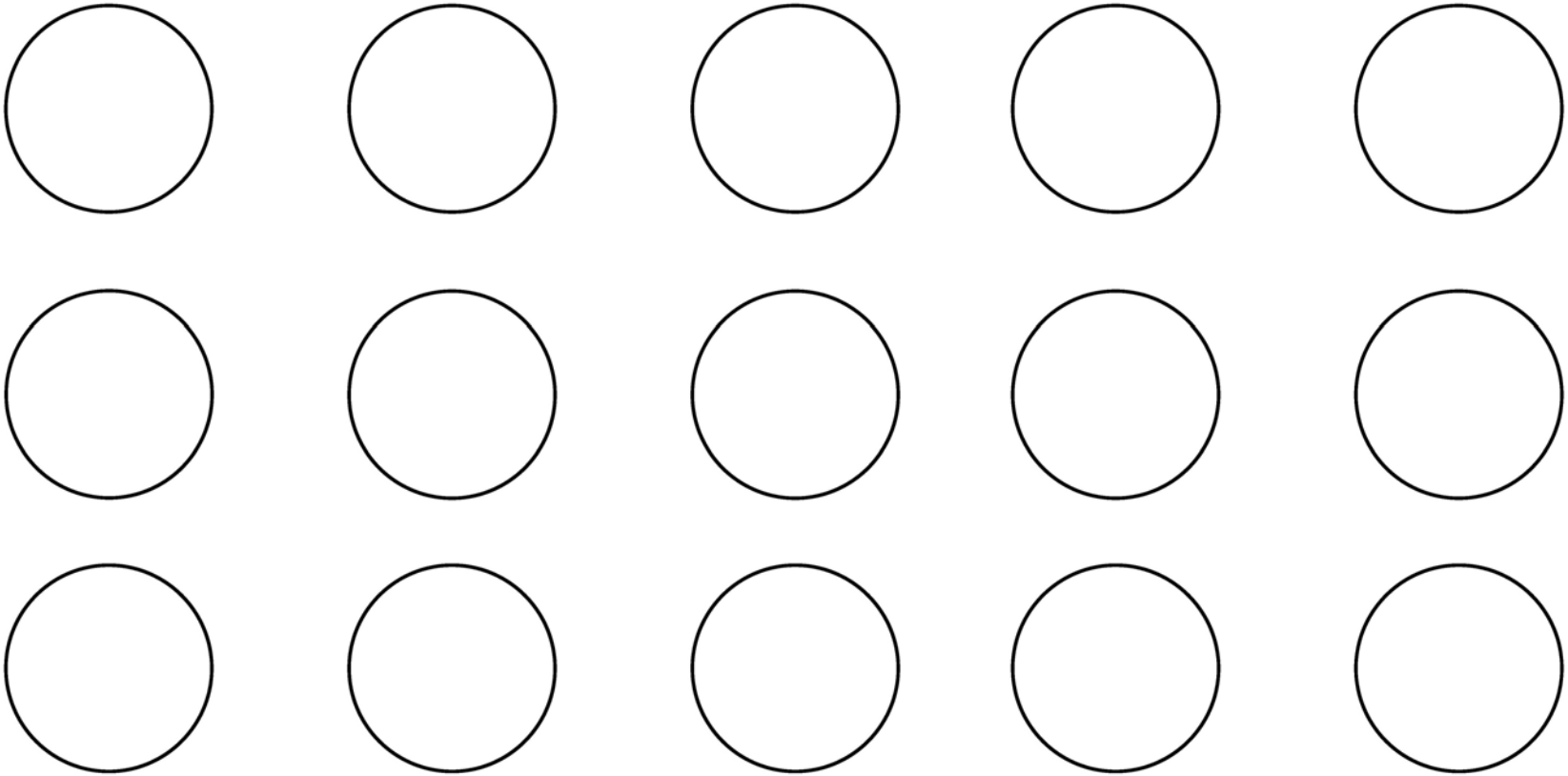

Figure G-1 Speed Grid Target

Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.

Name: _____ Date: _____

TIMED ACTIVITIES

BEAT THE CLOCK

Objective: To fire pellets into the designated hours (numbers) within a time limit.

Scoring: One point is awarded for each correct hour (number) hit by a pellet within the time allotted.

Equipment Required:

Mandatory: Beat the Clock Target (one per cadet).

Optional aids to firing are limited to the following:

- Cadet air rifle sling,
- Marksmanship jacket,
- Shooting glove, and
- Hat.

Activity Instructions:

1. Distribute one Beat the Clock Target to each cadet.
2. Have the cadets write their name and date on the target and attach it to the target frame.
3. Have the cadets fire, in relays, following the commands given by the RSO.
4. Have the RSO using the clock, call out one number every 20 second for a total of six numbers.
5. Give the cadets six pellets to fire, one pellet at each hour (number) as it is called.
6. Score the targets awarding one point for each correct number hit on the target.
7. Allow the cadets to review and keep their targets.

The following are prohibited:

- Alterations made to the rifles,
- Supports used as a rest for the rifle or the forearm,
- A spotting scope,
- Use of sights not provided with the cadet air rifle, and
- Coaching.

Note: To make this activity more difficult, shorten the time allowance.

BEAT THE CLOCK TARGET

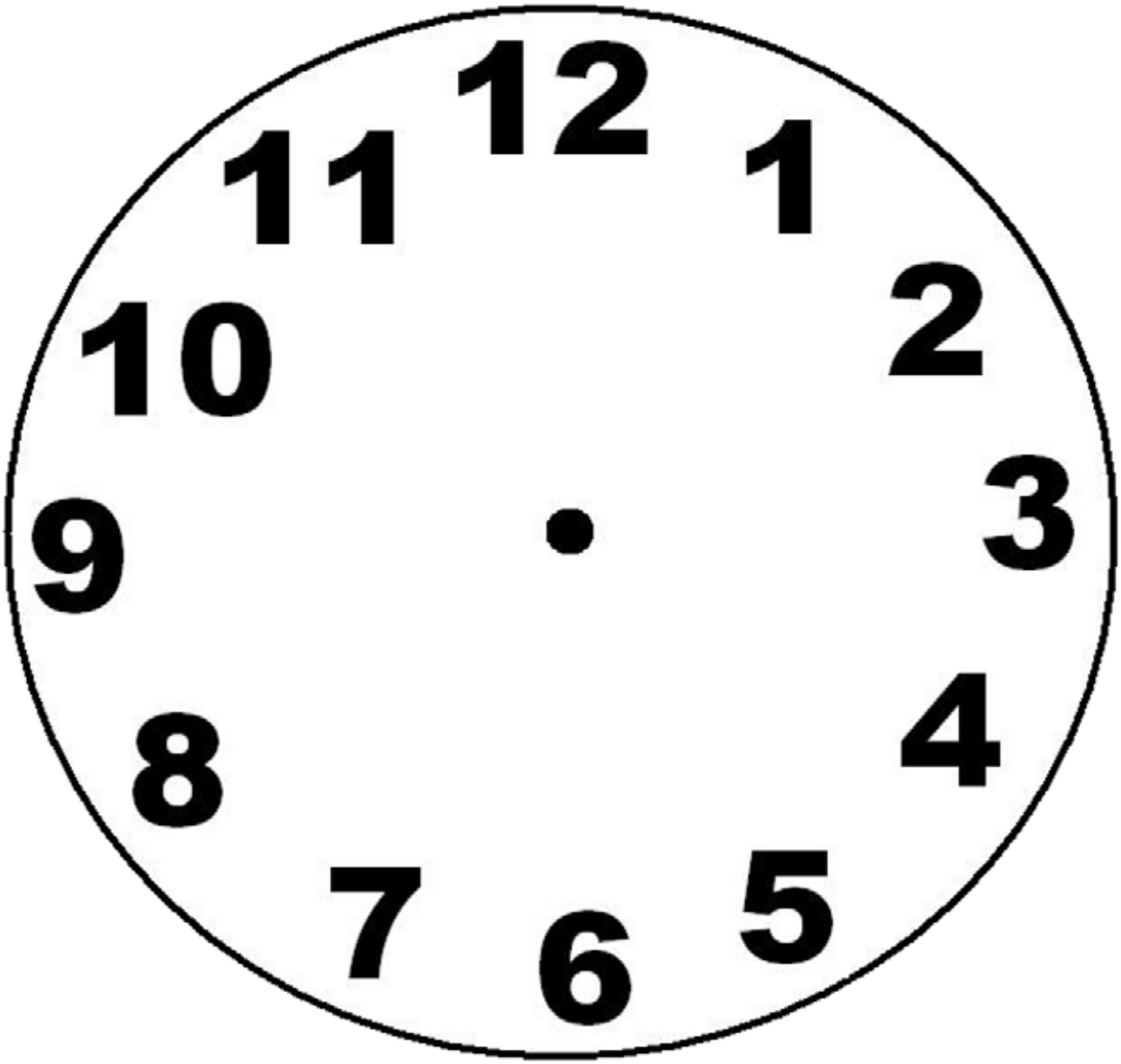

Figure H-1 Clock Target

Note. Created by Director Cadets 3, 2007, Ottawa, ON: Department of National Defence.

Name: _____ Date: _____

COMPETITIVE ACTIVITIES

SQUADRON MARKSMANSHIP COMPETITION

Objective: To provide cadets the opportunity to compete within the squadron.

Scoring: Targets will be scored IAW A-CR-CCP-177/PT-001, *Canadian Cadet Movement: Cadet Marksmanship Program Reference Manual*, to include:

- Each target has a highest possible score of 100 points (10 diagrams worth 10 points each).
- All shot holes are scored using the highest value of the scoring ring that it is broken.
- Shots outside the scoring rings are given a value of zero.
- If more than the one pellet is fired on a target, the shots with the highest value will be discarded until one shot remains on the target. Also, a two-point penalty will be applied to each excess shot.
- If more than one shot is fired at a scoring diagram, only the prescribed number of shots may be fired at the remaining diagrams (eg, if two shots were fired at the first diagram, one diagram on the target would remain blank [free of shots]). If this occurs more than twice, a two-point penalty will be applied to each excess shot.
- This activity may be conducted as individuals or teams of four.

Equipment Required:

Mandatory: CCT2001AR853 CCM Competition Targets (two per cadet).

Optional aids to firing are limited to the following:

- Cadet air rifle sling,
- Marksmanship jacket,
- Shooting glove, and
- Hat.

Activity Instructions:

1. Distribute two CCT2001AR853 CCM Competition Targets to each cadet.
2. Have the cadets write their name and date on each target and attach them to the target frame.
3. Give the cadets 20 scoring pellets to fire, one pellet at each scoring diagram (additional zeroing pellets are permitted).
4. Have the cadets fire, in relays, following the commands given by the RSO.
5. Give the cadets 30 minutes to complete firing.
6. Have the RSO collect the targets, score as described above and record the results.
7. Allow the cadets to review and keep their targets.

The following are prohibited:

- Crossfiring,
- Alterations made to the rifles,
- Supports used as a rest for the rifle or the forearm,
- A spotting scope, and
- Use of sights not provided with the cadet air rifle.

COMPETITIVE ACTIVITIES

LUNAR LAUNCH

Objective: To provide cadets the opportunity to compete within the squadron.

Scoring: The average distance from the earth to the moon is 384 400 km. All targets from marksmanship activities conducted during marksmanship training will be added together to calculate a distance from Earth and achieve a position on the space shuttle crew. The four scoring levels / positions must meet the following standards:

1.	Mission Commander:	A score of 100 plus:	384 400 km from earth, lunar landing!
2.	Mission Specialist:	A score of 75 to 99:	288 300 km from earth.
3.	Chief Engineer:	A score of 50 to 74:	192 200 km from earth.
4.	Science Officer:	A score of 25 to 49:	96 100 km from earth, lunar launch!

Equipment Required:

Mandatory: Scores for all targets used in marksmanship activities during the training year.

Activity Instructions:

1. Add the scores from the targets used by each cadet during the training year.
2. Use the scoring method described above to assign the cadets levels / positions on the space shuttle crew.

Notes:

1. A record must be kept of each cadet's scores from all marksmanship activities.
2. This activity may be conducted over multiple training years.
3. The certificate found at Attachment J may be awarded to cadets who achieve levels / positions in this activity.

This is to certify that

_____

has achieved the position of

_____

in the

Lunar Launch Marksmanship Activity

_____ Date

_____ Range Safety Officer

COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 2

EO C406.01 – ASSIST THE RANGE SAFETY OFFICER (RSO)

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

PRE-LESSON ASSIGNMENT

Photocopy, distribute and have each cadet read the Ways to Assist the RSO handout located at Attachment A a minimum of one week prior to delivering the lesson.

APPROACH

A group discussion was chosen for this lesson as it allows the cadets to interact with their peers and share their knowledge, experiences, opinions, and feelings about assisting the RSO. Sharing in the discussion encourages the cadet to examine their own thoughts and feelings and may prompt them to re-examine their previously held ideas. Participating in a group discussion improves the cadets' listening skills and team development.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to assist the RSO on an air rifle range.

IMPORTANCE

It is important for cadets to have knowledge of how to assist the Range Safety Officer (RSO) on the range. In order to assist the RSO, cadets must know how to set up and dismantle an air rifle range, control pellets, perform the duties of a range sentry, and score targets.

Teaching Point 1 **Discuss ways to assist the RSO.**

Time: 25 min Method: Group Discussion

BACKGROUND KNOWLEDGE

The point of the group discussion is to draw the following information from the group using the tips for answering / facilitating discussion and the suggested questions provided.

SETTING UP AN AIR RIFLE RANGE

Once the required air rifle range equipment has been collected and the cadet air rifles have been inspected, the equipment can be set up. The specific details of an air rifle range layout may vary depending on the type of air rifle range; however, the dimensions and location of the equipment will remain the same. The air rifle range will be set up by:

1. **Post warning signals.** A sentry should be posted at access points if they cannot be permanently blocked (eg, a door to a gymnasium that does not have a lock).

2. **Set up equipment at the backstop.** At one end of the room, the target frames will be set up in front of a wall. Care should be taken to avoid using a wall with windows or other items (eg, light switch, fire alarm, smoke detector) that would be damaged by a stray pellet. If this is unavoidable, a plywood covering should be placed over those items. The front of the target frame must be perpendicular to the floor and aligned with the front of other target frames along a target line. Additional lighting may be required for the target during some competition activities to satisfy competition rules. Lighting will not interfere with the cadets' view of the target frame.

3. **Indicate firing lanes.** Target frames will be centred in a lane at least 1.25 m wide and extend away from the target line toward the firing point a distance of 10 m. 10 m from the target line, another line will be marked on the floor. This is the firing line and no person will move forward of it without permission from the RSO.

4. **Place equipment at the firing point.** Behind the firing line is the firing box, an area at least 1.25 m wide by 2.5 m deep. A firing box will be allocated for each firer. A shooting mat will be placed within the firing box aligned with the firing line (during standing position firing no mat is required). Safety glasses / goggles will be placed on every shooting mat. An area behind the firing box will be allocated for range staff.

5. **Place equipment behind the firing point.** The area behind the firing point contains the table(s) required to set up a pellet distribution point, scoring area or other workspace as required for the specific air rifle marksmanship activity being conducted. The first aid point with stretcher is located in this area and must be clearly identified. The handwashing facility may be located on the range behind the firing point or in a washroom within the building.

6. **Place the cadet air rifle at the firing point.** A cadet air rifle with cadet air rifle safety rod will be the last item placed on the air rifle range. When removing the cadet air rifle from the case, control the muzzle by carrying the cadet air rifle in a vertical position with a cadet air rifle safety rod inserted into the barrel. Once the cadet air rifle is placed on the firing point, the cadet air rifle safety rod may be removed

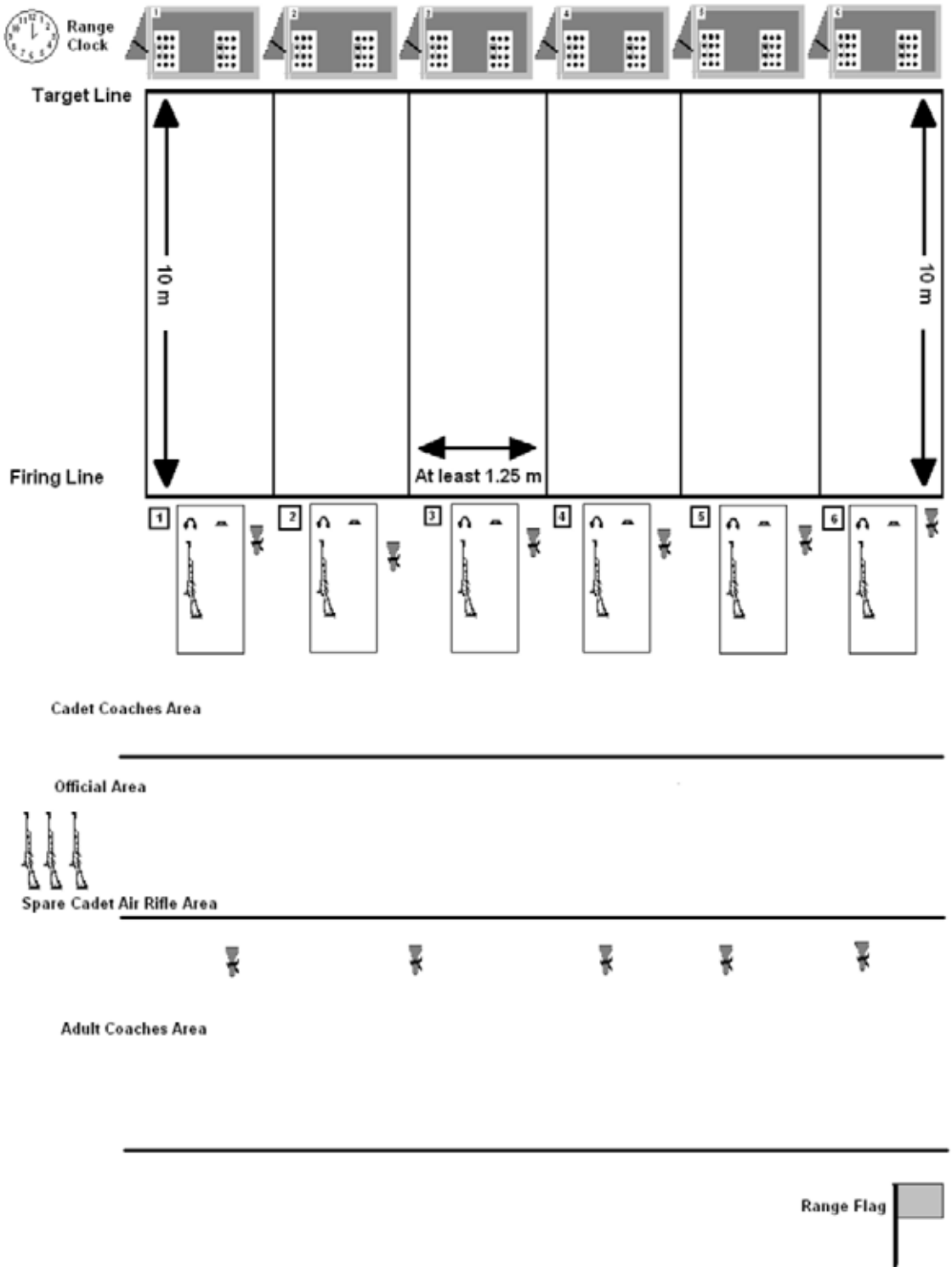

Figure 1 Cadet Air Rifle Range

Note. Created by D Cdts 3, 2007, Ottawa, ON: Department of National Defence.

DISMANTLING AN AIR RIFLE RANGE

Once the air rifle marksmanship activity has been completed, the air rifle range can be dismantled. The air rifle range will be dismantled by:

1. **Store the cadet air rifle.** After an air rifle marksmanship activity, the cadet air rifle is the first piece of range equipment secured. A cadet air rifle safety rod is inserted into the barrel before the cadet air rifle is moved from the firing point. Cadet air rifles are securely stored at the unit according to current policy guidelines.

For detailed storage requirements for the cadet air rifle refer to NDSI 65, *Storage and Transportation of Rifles for Canadian Rangers, Cadets and Junior Canadian Rangers*.

2. **Store the equipment behind the firing point.** Equipment used behind the firing point is stored next. Equipment must be cleaned (if required) and stored to prevent damage. If the first aid kit has been used, it may require refilling.

3. **Store the equipment at the firing point.** Equipment used at the firing point is stored next. Equipment must be cleaned (if required) and stored to prevent damage. Care should be taken to minimize scratching of safety glasses / goggles. Shooting mats are folded or rolled properly to minimize rips or tears. Spotting scopes are stored in their cases (if applicable).

4. **Clean the backstop area.** Once the firing point equipment has been secured, the target frames are thoroughly emptied of spent pellets. The target holder is cleaned of any material (eg, targets, thumbtacks, staples) and the target frame is folded and stored.

5. **Clean the firing lanes.** Since lead dust in the air is a minor hazard to safety, a method of sweeping / mopping that reduces the amount of dust produced should be used. One set of cleaning gear is used after air rifle marksmanship activities to limit cross-contamination of other areas of the building.

6. **Remove the warning signals.** Once all other air rifle marksmanship equipment has been secured, the range warning signals are removed. This will indicate that the room in which the temporary indoor range was set up is now cleaned and ready for general use.

PELLET CONTROLLER

During an air rifle marksmanship activity, cadets may be appointed to assist the RSO by acting as a pellet controller. The duties of a pellet controller include:

- **Maintain possession of pellets at all times.** Pellets are placed in the possession of the pellet controller. They ensure the pellets are secured at all times by means of direct supervision.

- **Distribute pellets.** Depending on the specific type of air rifle marksmanship activity being conducted, the pellet controller counts pellets into containers that will be placed on the firing point upon the RSO's command.

- **Dispose of pellets.** Once the air rifle marksmanship activity is concluded, the pellet controller ensures that the area around the target frame is swept. The spent pellets are collected into a container for disposal by the RSO.

Since pellets are made of lead, a hazardous material, they must be disposed IAW local standing orders.

- **Record the number of pellets used during the activity.** As the activity proceeds, the pellet controller tracks the number of pellets being used during each relay. Once the activity is complete, the total number of pellets used can be calculated. Any additional pellets given by the RSO / range assistants to cadets during the activity (eg, misfires, deformed pellets) are added to the total. This information is used by the RSO to track the quantity of pellets available at the unit.

The need to record the number of pellets used at a corps / squadron / CSTC may or may not be regionally directed. In the case where no requirement exists, it is still an effective tool for the RSO and a practical leadership opportunity for the cadets acting as pellet controllers.

- **Record the number of pellets used for each rifle.** The Cadet Air Rifle Usage Log shows the RSO when one thousand pellets have been fired by each cadet air rifle. When one thousand pellets have been fired the cadet air rifle requires cleaning. The pellet controller records the total number of pellets used in each cadet air rifle during the air rifle activity.

The Cadet Air Rifle Usage Log was developed as a practical leadership opportunity for cadets to be given added responsibility while they act as a pellet controller.

RANGE SENTRY

A range sentry is responsible, during the course of firing, to restrict entry on to the range and for changing warning signals when instructed to do so by the RSO. They must be able to constantly communicate with the RSO to report any safety concerns.

Restrict Access to the Range During Firing

On most indoor temporary ranges, access points exist and must be secured during the course of firing. By posting a range sentry outside an access point, the RSO can be assured no one can access the range and be struck by pellets. On outdoor ranges, roads leading to the range may need to be blocked and a range sentry posted to control vehicle access. In a situation where the range sentry is unable to directly attract the attention of the RSO, a means of communication such as a hand-held radio may be required.

Control Range Warning Signals

Range sentries are responsible for controlling the range warning signals. At the commencement of an air rifle marksmanship activity, a green flag / light / signal shall be posted to alert people that the range is in use but no live firing is currently in progress. The location of warning signals vary based on the local specifications of the air rifle range being used. Typically, warning signals are posted at the backstop, firing point and on access roads leading to the range.

For indoor ranges, warning signals are posted at entranceways to the room in which the range is set up. On the command of the RSO, the range sentry changes the green warning signal to red. The red signal alerts people that the range is in use and live firing is in progress. The red warning signal is posted from before the course of fire begins until the RSO has cleared the last cadet air rifle of the relay. At this time, on the command of the RSO,

the range sentry changes the warning signal back to green. At the conclusion of the air rifle marksmanship activity, all warning signals are removed to indicate that the range is no longer in use.

Notify the RSO of Safety Concerns Inside / Outside the Range Area

During the conduct of an air rifle marksmanship activity, the range sentry is responsible for bringing safety concerns both on and off the range area to the attention of the RSO. These concerns may include wildlife entering the range or visitors requesting access to the range.

FIRING POINT ASSISTANT

A firing point assistant is appointed by the RSO; usually to a specific number of firing points (eg, firing points 1–4). Their main responsibility is to ensure that the firers are carrying out the RSO's commands safety and correctly.

Supervise Firers Responding to Range Commands

As the RSO gives commands, the firing point assistant observes the firers to ensure they respond correctly. Each cadet should know exactly what to do when given a command on the range. When a cadet does not perform the given command, the firing point assistant will move to the cadets firing point to ensure they are capable of firing on the range and assist where necessary. If safety is a concern, notify the RSO as soon as possible.

Assist Firers as Necessary

Some cadets may require assistance throughout the firing practice (eg, pumping the cadet air rifle, tightening their sling). The firing point assistant will look for opportunities where assistance is required, and help out the cadets as necessary.

Correct Errors

When errors are made, the firing point assistant will correct them immediately. To correct an error, explain what was done wrong, demonstrate how to perform it correctly (if able to do so) and observe the cadet perform.

Notify the RSO of Safety Concerns

Any safety concerns observed on the range shall be brought to the attention of the RSO immediately.

TARGET SCORER

The target scorer is responsible for scoring targets once they have been fired. Once a target has been scored, the score is recorded directly on the target. In some cases, an RSO may require the scores to be recorded on a spreadsheet or separate piece of paper.

The process for scoring targets is detailed in EO C406.02 (Score Air Rifle Marksmanship Targets).

There are two official targets used for air rifle marksmanship activities: the CCM Air Rifle Grouping Target (CCT2000GRTD) and the CCM Competition Target (CCT2001AR853). There are various targets used in fun and timed air rifle marksmanship activities. These other targets are reproduced locally and can be found attached to the activity's applicable instructional guide.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. What are some of the ways to assist an RSO?

Q2. What are the dimensions of a firing lane?

Q3. What will be the last piece of equipment placed on the air rifle range?

Q4. What method of cleaning should be used to clean the firing lanes on an indoor temporary air rifle range?

Q5. What are the five duties of a pellet controller?

Q6. How must pellets be disposed?

Q7. What is one benefit of tracking how many pellets were fired during an air rifle activity?

Q8. What are the responsibilities of a range sentry?

Q9. Why is it important to restrict access points to the air rifle range?

Q10. What does a red warning signal indicate?

Q11. What are the duties of a firing point assistant?

Q12. What are some occasions on the range in which the firing point assistant can assist the firers?

Q13. When a cadet is making an error, how should it be corrected?

Q14. Once a target is scored, where is the value recorded?

Q15. What are the two official targets used for air rifle marksmanship activities?

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the group discussion will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' participation in the group discussion will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

There will be many opportunities to assist the RSO when completing marksmanship activities. Knowing how to set up and dismantle an air rifle range, enforce safety, control pellets, assist on the firing point and score targets are critical duties that have to be completed whenever completing air rifle marksmanship activities. The ways to assist an RSO produce a variety of leadership opportunities.

INSTRUCTOR NOTES / REMARKS

Cadets will assist the RSO during marksmanship activities, specifically EO M406.01 (Participate in a Recreational Marksmanship Activity) and EO C106.01 (Participate in a Recreational Marksmanship Activity).

REFERENCES

A0-027 A-CR-CCP-177/PT-001 Director Cadets 3. (2005). *Cadet marksmanship program: Reference manual*. Ottawa, ON: Department of National Defence.

A0-041 CATO 14-41 Director Cadets 4. (2009). *Authorized rifle training*. Ottawa, ON: Department of National Defence.

WAYS TO ASSIST THE RSO

SET UP AN AIR RIFLE RANGE

Once the required air rifle range equipment has been collected and the cadet air rifles have been inspected, the equipment can be set up. The specific details of an air rifle range layout may vary depending on the type of air rifle range; however, the dimensions and location of the equipment will remain the same. The air rifle range will be set up by:

1. **Post warning signals.** A sentry should be posted at access points if they cannot be permanently blocked (eg, a door to a gymnasium that does not have a lock).

2. **Set up equipment at the backstop.** At one end of the room, the target frames will be set up in front of a wall. Care should be taken to avoid using a wall with windows or other items (eg, light switch, fire alarm, smoke detector) that would be damaged by a stray pellet. If this is unavoidable, a plywood covering should be placed over those items. The front of the target frame must be perpendicular to the floor and aligned with the front of other target frames along a target line. Additional lighting may be required for the target during some competition activities to satisfy competition rules. Lighting will not interfere with the cadets' view of the target frame.

3. **Indicate firing lanes.** Target frames will be centred in a lane at least 1.25 m wide and extend away from the target line toward the firing point a distance of 10 m. 10 m from the target line, another line will be marked on the floor. This is the firing line and no person will move forward of it without permission from the RSO.

4. **Place equipment at the firing point.** Behind the firing line is the firing box, an area at least 1.25 m wide by 2.5 m deep. A firing box will be allocated for each firer. A shooting mat will be placed within the firing box aligned with the firing line (during standing position firing no mat is required). Safety glasses / goggles will be placed on every shooting mat. An area behind the firing box will be allocated for range staff.

5. **Place equipment behind the firing point.** The area behind the firing point contains the table(s) required to set up a pellet distribution point, scoring area or other workspace as required for the specific air rifle marksmanship activity being conducted. The first aid point with stretcher is located in this area and must be clearly identified. The handwashing facility may be located on the range behind the firing point or in a washroom within the building.

6. **Place the cadet air rifle at the firing point.** A cadet air rifle with cadet air rifle safety rod will be the last item placed on the air rifle range. When removing the cadet air rifle from the case, control the muzzle by carrying the cadet air rifle in a vertical position with a cadet air rifle safety rod inserted into the barrel. Once the cadet air rifle is placed on the firing point, the cadet air rifle safety rod may be removed.

DISMANTLE AN AIR RIFLE RANGE

Once the air rifle marksmanship activity has been completed, the air rifle range can be dismantled. The air rifle range will be dismantled by:

1. **Store the cadet air rifle.** After an air rifle marksmanship activity, the cadet air rifle is the first piece of range equipment secured. A cadet air rifle safety rod is inserted into the barrel before the cadet air rifle is moved from the firing point. Cadet air rifles are securely stored at the unit according to current policy guidelines.

2. **Store the equipment behind the firing point.** Equipment used behind the firing point is stored next. Equipment must be cleaned (if required) and stored to prevent damage. If the first aid kit has been used, it may require refilling.

3. **Store the equipment at the firing point.** Equipment used at the firing point is stored next. Equipment must be cleaned (if required) and stored to prevent damage. Care should be taken to minimize scratching of safety glasses / goggles. Shooting mats are folded or rolled properly to minimize rips or tears. Spotting scopes are stored in their cases (if applicable).

4. **Clean the backstop area.** Once the firing point equipment has been secured, the target frames are thoroughly emptied of spent pellets. The target holder is cleaned of any material (eg, targets, thumbtacks, staples) and the target frame is folded and stored.

5. **Clean the firing lanes.** Since lead dust in the air is a minor hazard to safety, a method of sweeping / mopping that reduces the amount of dust produced should be used. One set of cleaning gear is used after air rifle marksmanship activities to limit cross-contamination of other areas of the building.

6. **Remove the warning signals.** Once all other air rifle marksmanship equipment has been secured, the range warning signals are removed. This will indicate that the room in which the temporary indoor range was set up is now cleaned and ready for general use.

PELLET CONTROLLER

During an air rifle marksmanship activity, cadets may be appointed to assist the RSO by acting as a pellet controller. The duties of a pellet controller include:

- **Maintain possession of pellets at all times.** Pellets are placed in the possession of the pellet controller. They ensure the pellets are secured at all times by means of direct supervision.

- **Distribute pellets.** Depending on the specific type of air rifle marksmanship activity being conducted, the pellet controller counts pellets into containers that will be placed on the firing point upon the RSO's command.

- **Dispose of pellets.** Once the air rifle marksmanship activity is concluded, the pellet controller ensures that the area around the target frame is swept. The spent pellets are collected into a container for disposal by the RSO.

- **Record the number of pellets used during the activity.** As the activity proceeds, the pellet controller tracks the number of pellets being used during each relay. Once the activity is complete, the total number of pellets used can be calculated. Any additional pellets given by the RSO / range assistants to cadets during the activity (eg, misfires, deformed pellets) are added to the total. This information is used by the RSO to track the quantity of pellets available at the unit.

- **Record the number of pellets used for each rifle.** The Cadet Air Rifle Usage Log shows the RSO when one thousand pellets have been fired by each cadet air rifle. When one thousand pellets have been fired the cadet air rifle requires cleaning. The pellet controller records the total number of pellets used in each cadet air rifle during the air rifle activity.

RANGE SENTRY

A range sentry is responsible, during the course of firing, to restrict entry on to the range and for changing warning signals when instructed to do so by the RSO. They must be able to constantly communicate with the RSO to report any safety concerns.

Restrict Access to the Range During Firing

On most indoor temporary ranges, access points exist and must be secured during the course of firing. By posting a range sentry outside an access point, the RSO can be assured no one can access the range and be struck by pellets. On outdoor ranges, roads leading to the range may need to be blocked and a range sentry

posted to control vehicle access. In a situation where the range sentry is unable to directly attract the attention of the RSO, a means of communication such as a hand-held radio may be required.

Control Range Warning Signals

Range sentries are responsible for controlling the range warning signals. At the commencement of an air rifle marksmanship activity, a green flag / light / signal shall be posted to alert people that the range is in use but no live firing is currently in progress. The location of warning signals vary based on the local specifications of the air rifle range being used. Typically, warning signals are posted at the backstop, firing point and on access roads leading to the range.

For indoor ranges, warning signals are posted at entranceways to the room in which the range is set up. On the command of the RSO, the range sentry changes the green warning signal to red. The red signal alerts people that the range is in use and live firing is in progress. The red warning signal is posted from before the course of fire begins until the RSO has cleared the last cadet air rifle of the relay. At this time, on the command of the RSO, the range sentry changes the warning signal back to green. At the conclusion of the air rifle marksmanship activity, all warning signals are removed to indicate that the range is no longer in use.

Notify the RSO of Safety Concerns Inside / Outside the Range Area

During the conduct of an air rifle marksmanship activity, the range sentry is responsible for bringing safety concerns both on and off the range area to the attention of the RSO. These concerns may include wildlife entering the range or visitors requesting access to the range.

FIRING POINT ASSISTANT

A firing point assistant is appointed by the RSO; usually to a specific number of firing points (eg, firing points 1–4). Their main responsibility is to ensure that the firers are carrying out the RSO's commands safety and correctly.

Supervise Firers Responding to Range Commands

As the RSO gives commands, the firing point assistant observes the firers to ensure they respond correctly. Each cadet should know exactly what to do when given a command on the range. When a cadet does not perform the given command, the firing point assistant will move to the cadets firing point to ensure they are capable of firing on the range and assist where necessary. If safety is a concern, notify the RSO as soon as possible.

Assist Firers as Necessary

Some cadets may require assistance throughout the firing practice (eg, pumping the cadet air rifle, tightening their sling). The firing point assistant will look for opportunities where assistance is required, and help out the cadets as necessary.

Correct Errors

When errors are made, the firing point assistant will correct them immediately. To correct an error, explain what was done wrong, demonstrate how to perform it correctly (if able to do so) and observe the cadet perform.

Notify the RSO of Safety Concerns

Any safety concerns observed on the range shall be brought to the attention of the RSO immediately.

TARGET SCORER

The target scorer is responsible for scoring targets once they have been fired. Once a target has been scored, the score is recorded directly on the target. In some cases, an RSO may require the scores to be recorded on a spreadsheet or separate piece of paper.

There are two official targets used for air rifle marksmanship activities: the CCM Air Rifle Grouping Target (CCT2000GRTD) and the CCM Competition Target (CCT2001AR853). There are various targets used in fun and timed air rifle marksmanship activities. These other targets are reproduced locally and can be found attached to the activity's applicable instructional guide.

COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 3

EO C406.02 – SCORE AIR RIFLE MARKSMANSHIP TARGETS

Total Time:	30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy the Sample Grouping Target handout located at Attachment A for each cadet.

Photocopy the Sample Competition Target handout located at Attachment C for each cadet.

Prepare slides of the Air Rifle Grouping Template and Scoring Template found at Attachments B and D for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TP 1 to orient the cadets to the targets used during air rifle marksmanship activities and to generate interest in the subject.

A demonstration and performance was chosen for TPs 2 and 3 as it allows the instructor to explain and demonstrate scoring grouping and competition targets while providing an opportunity for the cadets to practice under supervision.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to score the CCM Air Rifle Grouping Target and the CCM Competition Target.

IMPORTANCE

It is important for cadets to score air rifle marksmanship targets as it provides a skill that will be used when they assist a Range Safety Officer (RSO). Being able to determine the score on a target will allow the cadet to monitor their progress as they improve in applying the principles of marksmanship.

Teaching Point 1 **Describe air rifle marksmanship targets.**

Time: 5 min Method: Interactive Lecture

AIR RIFLE MARKMANSHIP TARGETS

There are two official targets used for air rifle marksmanship activities: the CCM Air Rifle Grouping Target (CCT2000GRTD) and the CCM Competition Target (CCT2001AR853). There are various targets used in fun and timed air rifle marksmanship activities. These other targets are reproduced locally and can be found attached to the activity's applicable instructional guide.

CCM Air Rifle Grouping Target

The CCM Air Rifle Grouping Target is used during classification air rifle marksmanship activities. The target consists of two diagrams. Each diagram is a shaded black circle that is 3 cm in diameter. The diagram itself is provided on the target to give the marksman an aiming mark and thus any grouping fired at each diagram does not necessarily need to be contained on the black portion of the target.

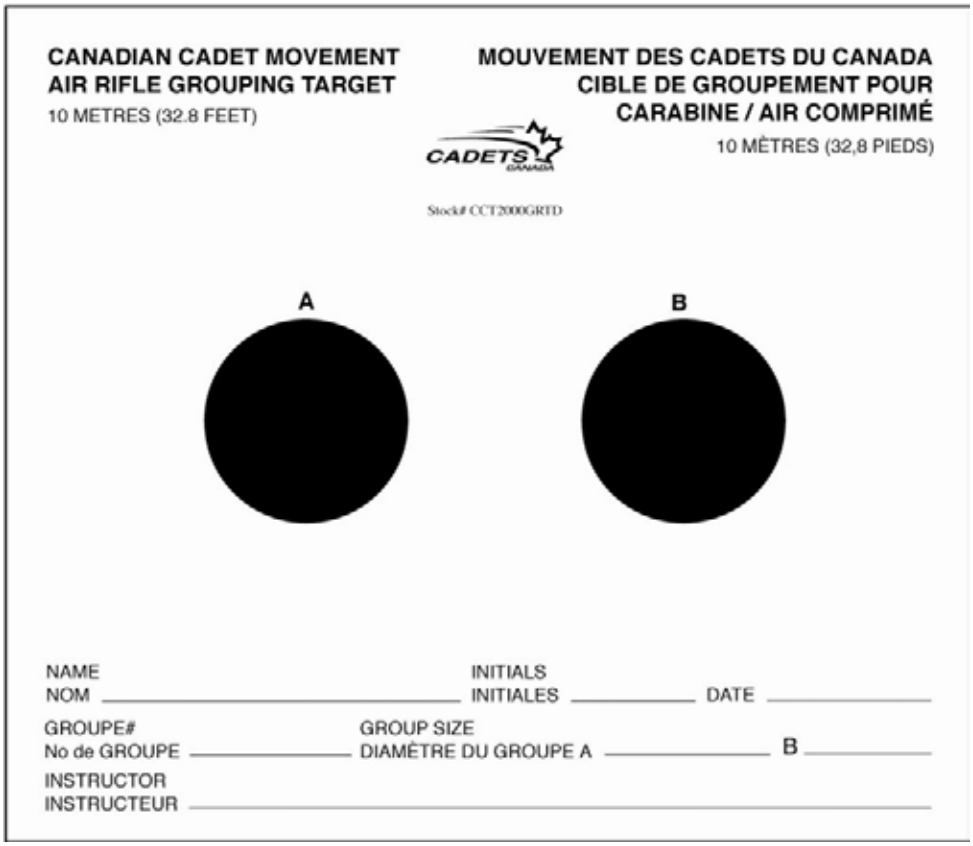

Figure 1 The CCM Air Rifle Grouping Target (CCT2000GRTD)

Note. Created by Director Cadets 4, 2000, Ottawa, ON: Department of National Defence.

CCM Competition Target

The CCM Competition Target, also called an application target, is the official target used in the CCM Marksmanship Championship Series. This target is used only with the cadet air rifle at a distance of 10 m (32.8 ft). The target contains 10 scoring diagrams and two sighting diagrams. Each scoring diagram consists of a 4.5-mm circle (the inner 3 cm of the scoring diagram is shaded black as an aiming mark) broken into

10 concentric scoring rings, scored from ten (the bull's eye) to one (the outer most ring). As there are 10 scoring diagrams, the highest possible score (HPS) is 100. The sighting diagrams, identical to the scoring diagrams and labelled A and B, are used by the firer to confirm zeroing the cadet air rifle during the competition relay.

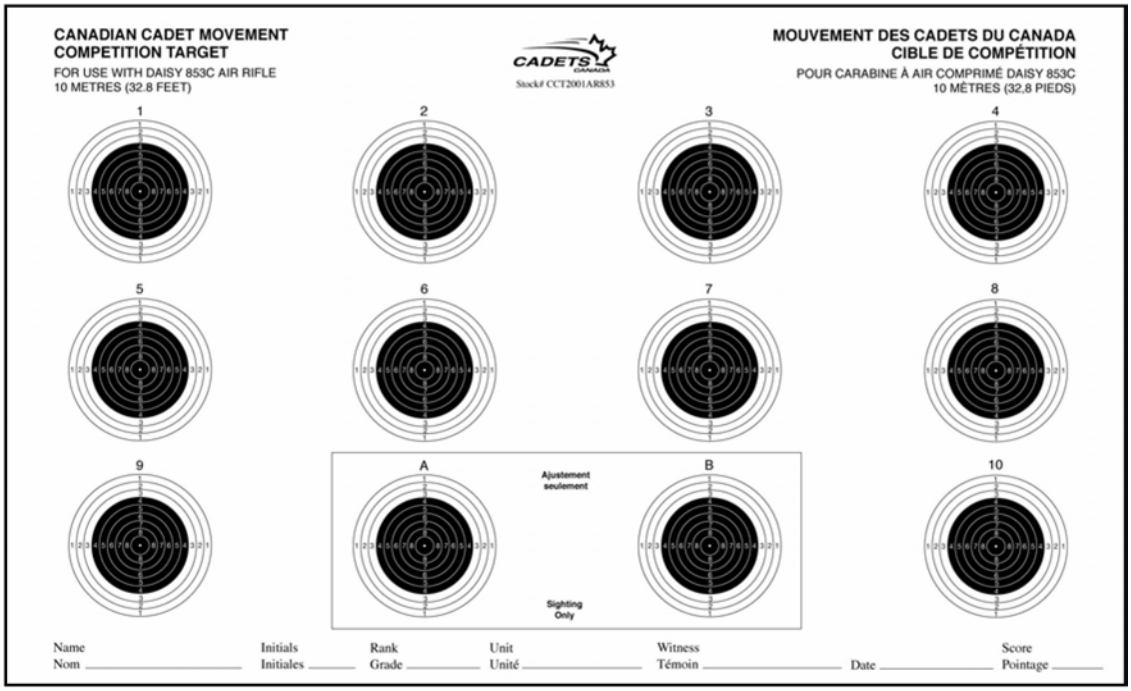

Figure 2 The CCM Competition Target (CCT2001AR853)

Note. Created by Director Cadets 4, 2001, Ottawa, ON: Department of National Defence.

Non-Standard Targets

Non-standard targets are used during fun and timed air rifle marksmanship activities. Non-standard targets are designed to give cadets a break from firing on the two official targets and allow for the development of activities that provide a different style marksmanship experience. Some examples of non-standard targets include the turkey shoot target, beat the clock targets, balloon targets and chase the dot targets. Other non-standard targets may be developed for use during fun and timed air rifle marksmanship activities by the activity leader as required.

Examples of non-standard targets used during fun and timed air rifle marksmanship activities can be found as attachments to EO M406.01 (Participate in a Recreational Marksmanship Activity). These targets are reproduced locally.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. How many scoring diagrams are there on the CCM Competition Target?

Q2. What is the HPS on the CCM Competition Target?

Q3. What are some types of targets used during fun and timed air rifle marksmanship activities?

ANTICIPATED ANSWERS:

A1. There are 10 scoring diagrams on the CCM Competition Target.

A2. The HPS on the CCM Competition Target is 100.

A3. Some targets used during timed air rifle marksmanship targets are beat the clock, speed grid and chase the dots.

Teaching Point 2 **Explain, demonstrate and have the cadets score the CCM Air Rifle Grouping Target.**

Time: 10 min Method: Demonstration and Performance

For this TP it is recommended that the instructor explain and demonstrate each step required to complete the skill then monitor the cadets as they imitate each step.

Note: Assistant instructors may be employed to monitor the cadets' performance.

Provide each cadet with the Sample Grouping Target handouts located at Attachment A and an Air Rifle Grouping Template located at Attachment B.

Air Rifle Grouping Template. The Air Rifle Grouping Template is a series of grouping circles engraved or printed on transparent material. It is used to confirm the diameter of a grouping fired during familiarization or classification firing. The Air Rifle Grouping Template consists of a series of grouping circle outlines, with diameters from 1–6 cm inclusive. It is very important to correctly and consistently measure grouping targets with the grouping template.

SCORING THE CCM AIR RIFLE GROUPING TARGET

Score the CCM Air Rifle Grouping Target using the following procedure:

1. **Determine there are five shots in the grouping.** Before scoring any grouping, the number of shots on the target is determined. If a cadet has not hit the target at least five times for each grouping the score will not count. It is difficult at times to determine when several pellet holes overlap. Observe the outline of the hole for the distinct outline of an arc of a clean pellet hole. This indicates the number of pellets that may have caused the larger hole. The skill level of cadets is also a good indication of how many shots are in a grouping. If a cadet is shooting a larger grouping size, the possibility for two pellets fired exactly through one hole is slim.

Each diagram on the Sample Grouping Target handout contains five shots.

2. **Align the Air Rifle Grouping Template over the five-shot grouping so that all shots are within a scoring ring.** Once the grouping has been confirmed as being made up of five shots, the Air Rifle

Grouping Template is placed over the target. The Air Rifle Grouping Template should be aligned so that all the shots fit easily within a grouping circle without touching.

A grouping size of 4 cm will be large enough to serve as a starting point for each diagram on the Sample Grouping Target handout.

3. **Determine if the grouping will fit within the next smallest ring without touching the scoring ring.** Choose the next smallest grouping circle and determine if the group fits within it. The entire group must fit within the grouping circle without touching the inside edge.

4. **Repeat as required until the grouping will not fit within the next smallest scoring ring without touching the scoring ring.**

The correct grouping size for each diagram from the Sample Grouping Target handout is:

- Target 1, Diagram A–3.5 cm,
- Target 1, Diagram B–2.7 cm,
- Target 2, Diagram A–1.8 cm, and
- Target 2, Diagram B–2.5 cm.

5. **Record the grouping size on the target.** The grouping size recorded on the target is the corresponding grouping circle diameter.

6. **Determine the classification category.** Once two groupings have been scored on one grouping target, a determination is made as to the classification category obtained. There are four categories of marksmanship classification.

   - **Marksman**: Each grouping must be within a circle of 3 cm in diameter.
   - **First Class Marksman**: Each grouping must be with a circle of 2.5 cm in diameter.
   - **Expert Marksman**: Each grouping must be within a circle of 2 cm in diameter.
   - **Distinguished Marksman**: Each grouping must be within a circle of 1.5 cm in diameter.

   Each marksmanship classification category has a corresponding badge that may be worn on the uniform. The marksmanship classification does not expire and any improvement in the classification category during subsequent classification air rifle activities is reflected with the awarding of the higher category.

From the Sample Grouping Target handout, Target 1 does not meet the requirements for a marksmanship classification category. Target 2 meets the requirements for a First Class Marksman classification category.

Refer to Annex A of CATO 14-43, *Marksmanship Program*, for detailed instructions about the marksmanship classification program.

CONFIRMATION OF TEACHING POINT 2

The cadets' scoring of the Sample Grouping Target handout will serve as the confirmation of this TP.

Teaching Point 3 **Explain, demonstrate and have the cadets score the CCM Competition Target.**

Time: 10 min Method: Demonstration and Performance

For this TP it is recommended that the instructor explain and demonstrate each step required to complete the skill then monitor the cadets as they imitate each step.

Note: Assistant instructors may be employed to monitor the cadets' performance.

Divide the cadets into groups based on the number of scoring magnifiers and scoring plugs available. Distribute a Sample Competition Target handout located at Attachment C to each cadet. Distribute a scoring magnifier, scoring plug and Scoring Template found at Attachment D to each group.

SCORING THE CCM COMPETITION TARGET

Score the CCM Competition Target using the following procedure:

1. **Determine the score on each diagram.** Determine the score for each diagram using one or more of the following methods:

   a. **Determine the value by inspecting with the naked eye.** In most cases the scoring ring that has been broken is easily identifiable. The scoring diagrams on the competition target that can be scored in this manner are scored first as they can be completed in less time.

   b. **Determine the value using the .177-scoring magnifier.** If the pellet hole has occurred close to the edge of a scoring ring, it is necessary to use the scoring magnifier to enlarge the view and make a determination of value. Look through the magnifying lens and align the scoring magnifier over the pellet hole. If the pellet hole has broken or touched the higher scoring ring, award that value. If even a small gap exists between the pellet hole and the scoring ring the lower value must be awarded.

2. **Calculate penalties.** When scoring a target there are two penalties the scorer can determine and calculate. If a penalty is imposed, the rule number and penalty amount is noted next to the applicable diagram. The following rules are excerpts from the Canadian Cadet Movement Marksmanship Championship Series (CCMMCS).

22.3.4.1 If a Competitor fires more than the prescribed number of shots on the scoring area in a twenty (20) shot string, the shot(s) with the highest value will be discarded until the correct number of shots remain. In addition, a two (2) point Penalty will be deducted for each excess shot.

22.3.4.2 If a Competitor fires more than the prescribed number of shots on a scoring diagram, the Competitor must fire a like number of fewer shots on a subsequent scoring diagram in the same twenty (20) shot string. The Competitor will not be penalized for the first two (2) such occurrences in a Competition, but will be penalized two (2) points for each succeeding occurrence.

Figure 3 Scoring Penalties

Note. From *Canadian Cadet Movement: Cadet Marksmanship Program Reference Manual* (p. 4-4-31), by Director Cadets 3, 2005, Ottawa, ON: Department of National Defence.

3. **Record the score on the target.** Once the diagrams are given values and penalties are calculated, the score is totalled and recorded on the target. It is important to ensure the addition of values is accurate since during a competition protests may be filed due to inaccurate calculations.

CONFIRMATION OF TEACHING POINT 3

The cadets' scoring of the Sample Competition Target handout will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. What are the three types of targets used during air rifle marksmanship activities?

Q2. What size must each grouping be to award a Distinguished Marksman classification category?

Q3. When scoring targets, how is it determined when to score the higher ring value and when to score the lower ring value?

ANTICIPATED ANSWERS:

A1. The three types of targets are the CCM Grouping Target, CCM Competition Target and non-standard targets.

A2. Each grouping must be within a circle of 1.5 cm in diameter.

A3. If the pellet hole has broken or touched the higher scoring ring, award that value. If even a small gap exists between the pellet hole and the scoring ring the lower value must be awarded.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

You must be able to score air rifle marksmanship targets to perform your duties when assisting the RSO. Being able to score air rifle marksmanship targets will also allow you to assess your own performance and the performance of others.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

A0-027 A-CR-CCP-177/PT-001 Director Cadets 3. (2005). *Canadian Cadet Movement: Cadet marksmanship program reference manual*. Ottawa, ON: Department of National Defence.

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SAMPLE GROUPING TARGET

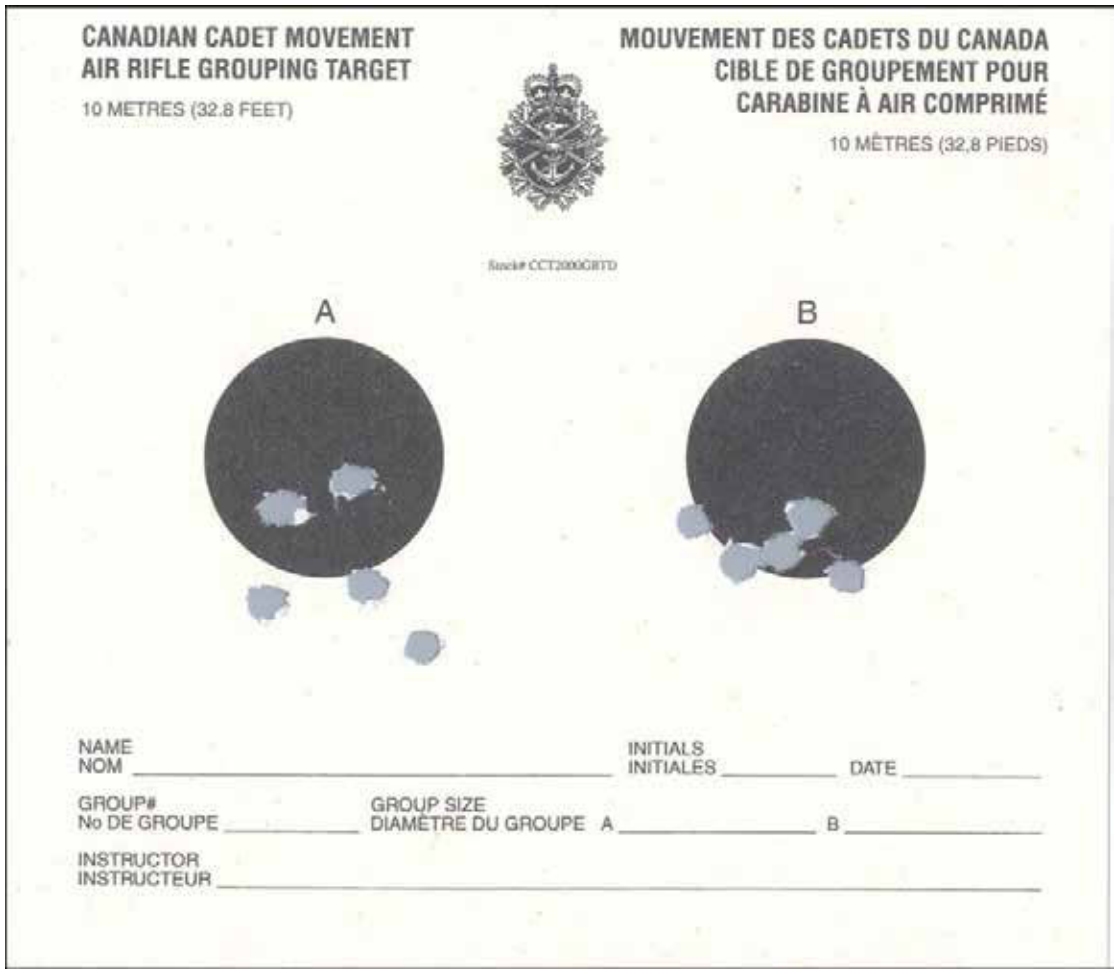

Figure A-1 Target 1

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

SAMPLE GROUPING TARGET

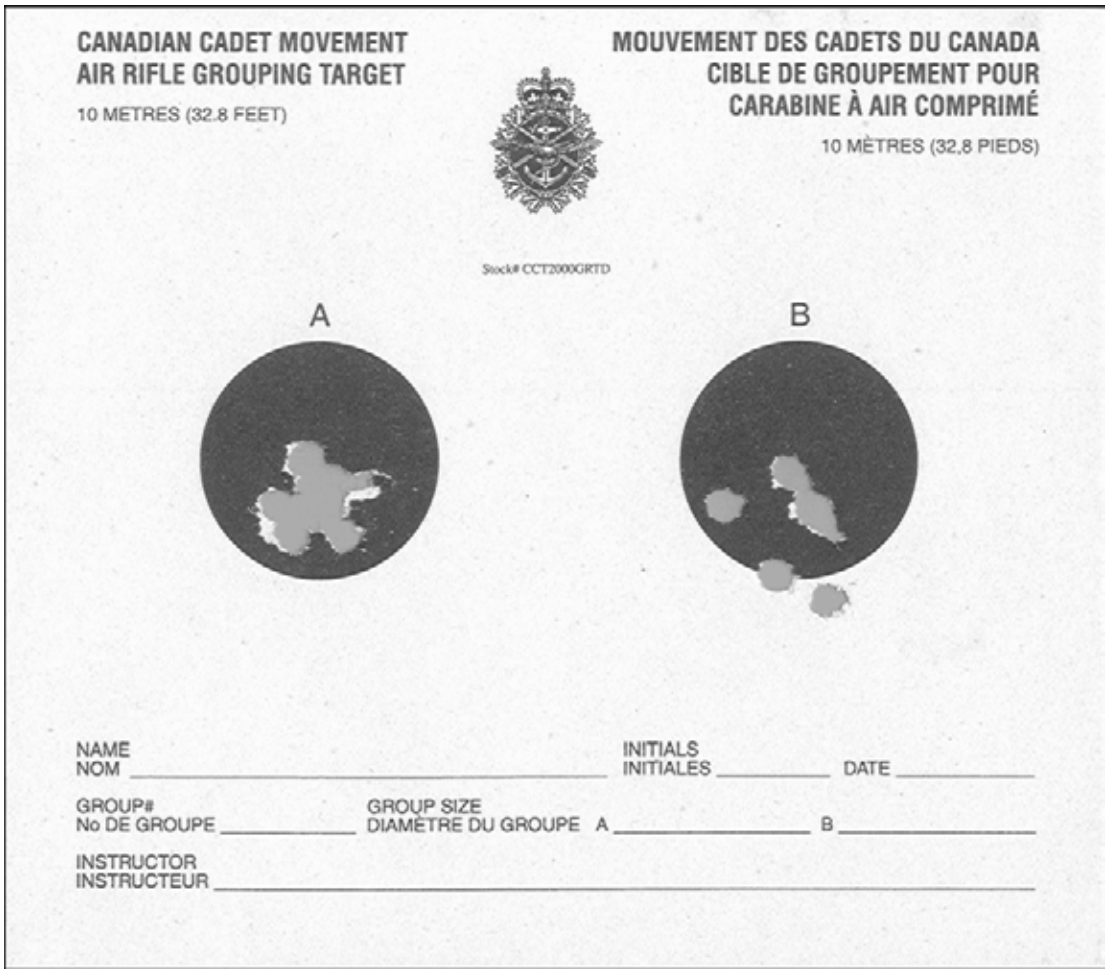

Figure A-2 Target 2

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

AIR RIFLE GROUPING TEMPLATE

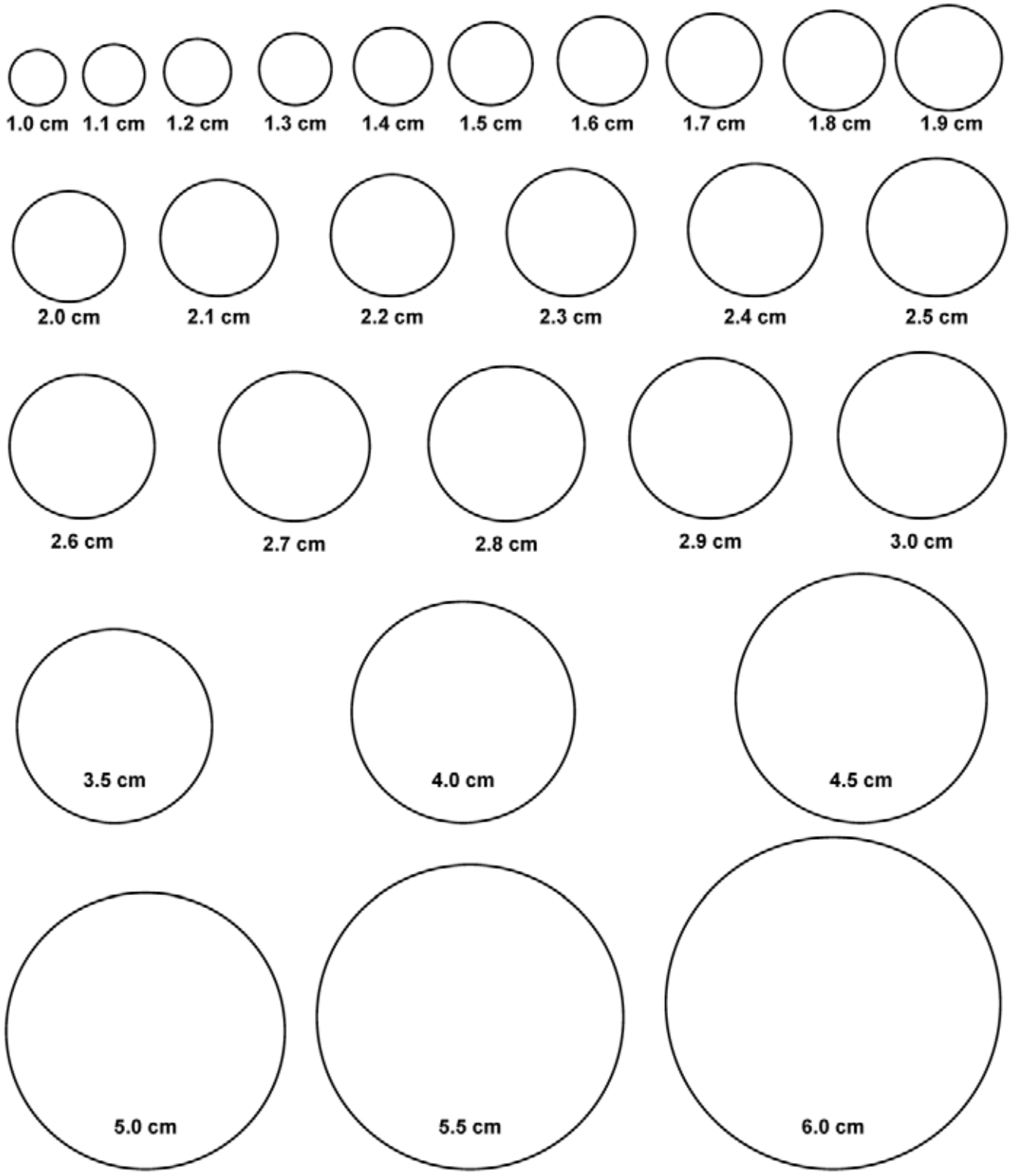

Figure B-1 Air Rife Grouping Template

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

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SAMPLE COMPETITION TARGET

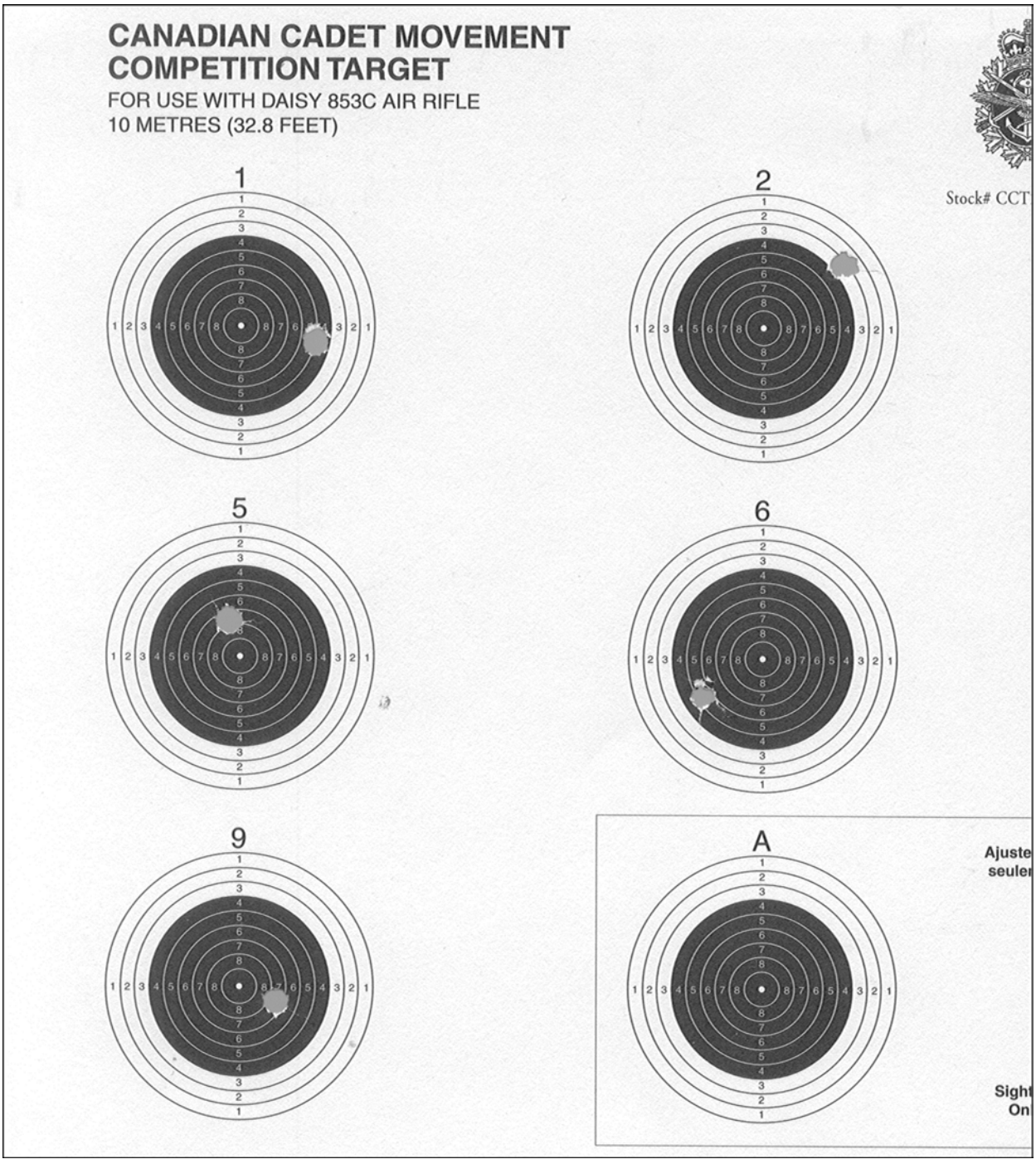

Figure C-1 Target 1 (Left Half)

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

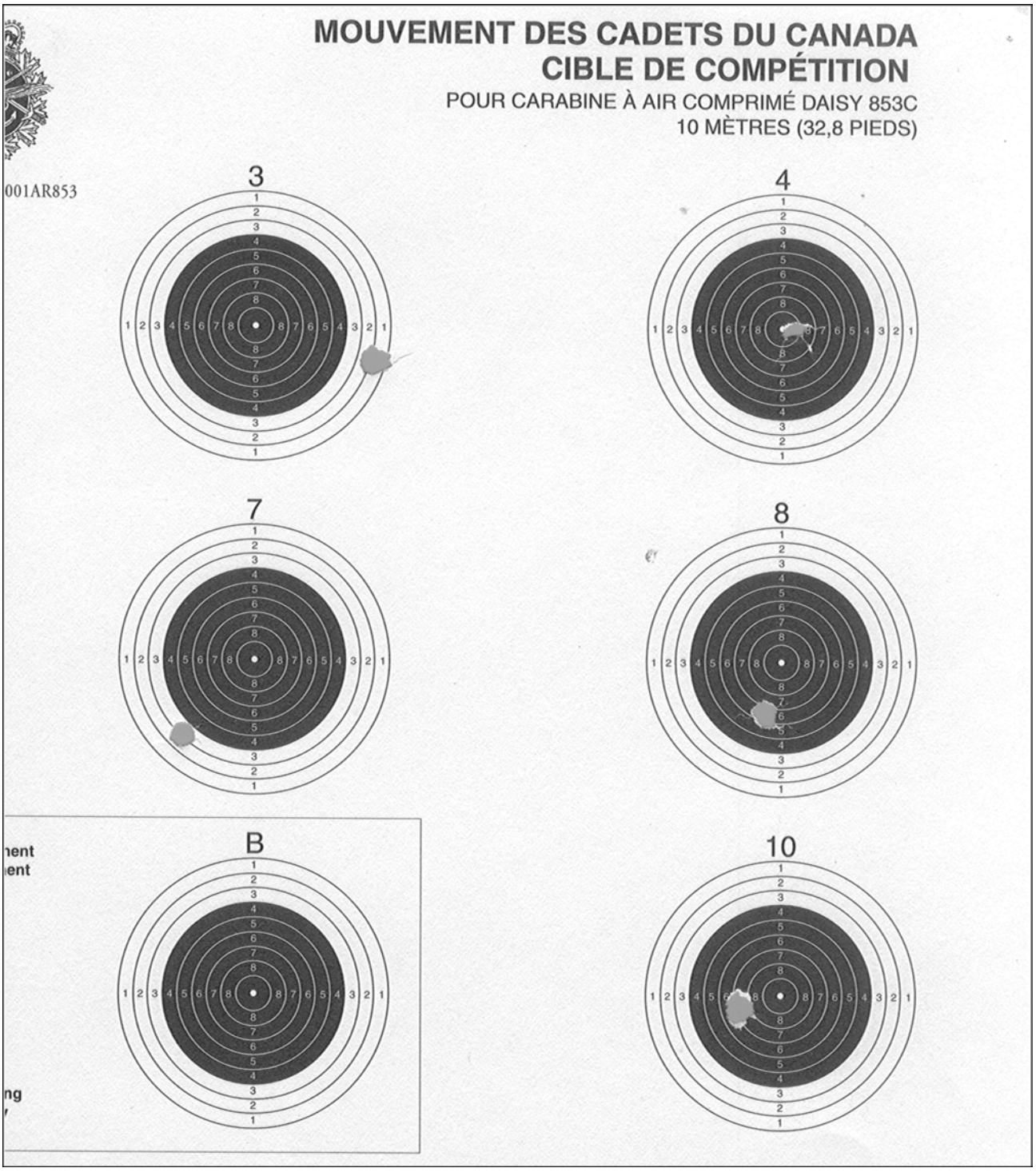

Figure C-2 Target 1 (Right Half)

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

SCORING TEMPLATE

Figure D-1 Scoring Template

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

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ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 1

EO M407.01 – DISCUSS PROFICIENCY LEVEL FOUR TRAINING OPPORTUNITIES

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy Attachment A for each cadet.

Prepare a handout or slide of the year's training schedule.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An in-class activity was chosen for TP 1 as it is an interactive way to provoke thought and stimulate interest among the cadets.

An interactive lecture was chosen for TP 2 to orient the cadets to and generate interest in Proficiency Level Four complementary training opportunities.

A group discussion was chosen for TP 3 as it allows the cadets to interact with their peers and share their knowledge, experiences, opinions, and feelings about leadership appointments at the squadron.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have discuss Proficiency Level Four training opportunities.

IMPORTANCE

It is important for cadets to know what training will be conducted during Proficiency Level Four to give them an overview of what the training year will entail. This lesson will prepare the cadets for the training year and help generate interest in the topics.

Teaching Point 1 **Conduct an in-class activity to identify Proficiency Level Four mandatory training opportunities.**

Time: 10 min Method: In-Class Activity

OVERVIEW

The training program is broken into Performance Objectives (POs), which are the overall subjects, and Enabling Objectives (EOs), which are the topics within each PO. Training is conducted as mandatory and complementary components.

Distribute a handout of Attachment A to each cadet.

MANDATORY TRAINING

Mandatory training encompasses the EOs that all squadrons must complete throughout the training year.

ACTIVITY

OBJECTIVE

The objective of this activity is to have the cadets participate in a gallery walk of information for each PO in order to identify Proficiency Level Four mandatory training opportunities.

RESOURCES

Resources will be IAW each PO as listed below.

ACTIVITY LAYOUT

The classroom will be set up with a station for each PO with a basic description of the PO, information, pictures, videos, and other training aids that will illustrate what the cadet will learn in each PO.

PO 402–Community Service

Community service provides the cadets an opportunity to perform community service. The community service should provide a direct benefit to the community and promote good citizenship.

Examples of information / training aids that could be set up at this station include:

- pictures from recent community service activities in which the squadron has participated, and
- video or pictures from Remembrance Day ceremonies or other ceremonial parades.

PO 403–Leadership

Leadership provides the cadets an opportunity to describe needs and expectations of team members, select an influence behaviour within the empowering leadership style, describe how to motivate cadets, provide feedback to team members, participate in a mentoring relationship and act as a team leader during a leadership appointment.

Examples of information / training aids that could be set up at this station include:

- motivational pictures of famous Canadian leaders, and
- pictures of cadets from the squadron participating in leadership activities.

PO 404–Personal Fitness and Healthy Living

Personal fitness and healthy living provides the cadets an opportunity to participate in the cadet fitness assessment, update personal activity plan and evaluate personal activity plan.

Examples of information / training aids that could be set up at this station include:

- a CD / cassette player with the audio recording of the 20-m Shuttle Run Test beeps, and
- copies of the Cadet Fitness Assessment Scoresheet.

PO 405–Recreational Sports

Recreational sports provide the cadets the opportunity to participate in organized recreational team sports. This is important as physical fitness is one of the aims of the cadet program.

Examples of information / training aids that could be set up at this station include:

- soccer ball,
- volleyball,
- floor hockey ball,
- hockey sticks,
- Frisbees, and
- pictures of cadets at the squadron participating in recreational sports.

PO 406–Air Rifle Marksmanship

Air rifle marksmanship provides the cadets an opportunity to participate in a recreational air rifle marksmanship activity.

A miniature range could be set up at this station, to include:

- a mat,
- a cadet air rifle,
- sample targets,
- a scope,
- a sling, and
- safety goggles / glasses.

PO 407–General Cadet Knowledge

General cadet knowledge provides the cadets with the information required to discuss Proficiency Level Four training opportunities and year four Cadet Summer Training Centre (CSTC) training opportunities.

Examples of information / training aids that could be set up at this station include:

- a list of Proficiency Level Four training enabling objectives, and
- information sheets / posters on year four summer training opportunities.

PO 408–Drill

Drill provides the cadets an opportunity to discuss commanding a flight, identify parade sequence, command a flight on parade and inspect a cadet on parade.

Examples of information / training aids that could be set up at this station include:

- a copy of A-PD-201-000/PT-000, *Canadian Forces Manual Of Drill And Ceremonial*,
- a video of the cadets in the squadron participating in drill, and
- pictures of a cadet being inspected.

PO 409–Instructional Techniques

Instructional techniques provides the cadets with an opportunity to identify methods of instruction, identify elements of a positive learning environment, describe learner needs, explain assessment and instruct a 30-minute lesson.

Examples of information / training aids that could be set up at this station include:

- instructional aids,
- pictures of instructors conducting a lesson, and
- samples from the QSP and IG, and sample lesson plans.

PO 420–Canadian Forces (CF) Familiarization

CF familiarization provides the cadets with an opportunity to describe Canadian air force traditions and identify Royal Canadian Air Force (RCAF) ranks.

Examples of information / training aids that could be set up at this station include:

- a CF mess kit, and
- a Canadian honours chart.

PO 431–Principles of Flight

Principles of flight provides the cadets an opportunity to explain features of wing design and describe flight instruments.

Examples of information / training aids that could be set up at this station include:

- a model of an aircraft wing, and
- examples of flight instruments.

PO 432–Propulsion

Propulsion provides the cadets an opportunity to describe fuel systems, describe propeller systems and engine instruments.

Examples of information / training aids that could be set up at this station include:

- pictures of aircraft components illustrating fuel systems and propeller systems, and
- aircraft engine instruments.

PO 436–Meteorology

Meteorology provides the cadets an opportunity to explain winds, and describe air masses and fronts

Examples of information / training aids that could be set up at this station include:

- a weather map showing fronts,
- pictures of various kinds of weather, and
- a video of winds.

PO 437–Navigation

Navigation provides the cadets an opportunity to define air navigation terms and describe the magnetic compass.

Examples of information / training aids that could be set up at this station include:

- examples of air navigation terms, and
- aircraft compasses or pictures of aircraft compasses.

PO 440–Aerospace

Aerospace provides the cadets an opportunity to identify aerospace materials and describe Canadian satellites.

Examples of information / training aids that could be set up at this station include:

- samples of aerospace materials, and
- pictures of Canadian satellites.

PO 490–Aircrew Survival

Aircrew survival provides the cadets an opportunity to assemble an emergency survival kit, operate a stove and a lantern, tie knots and lashings, navigate to a waypoint using a global positioning system (GPS) receiver, and light fires using improvised methods.

Examples of information / training aids that could be set up at this station include:

- an emergency survival kit,
- a stove and a lantern,
- a global positioning system (GPS) receiver, and
- improvised fire-lighting materials.

ACTIVITY INSTRUCTIONS

1. Have the cadets walk around the classroom for approximately 10 minutes, visiting each station.
2. After the gallery walk, answer any questions that the cadets may have, based on the stations that they have seen.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the activity will serve as the confirmation of this TP.

Teaching Point 2 **Identify Proficiency Level Four complementary training opportunities.**

Time: 10 min Method: Interactive Lecture

Complementary training provides cadets and squadron staff with a variety of topics and activities they can choose based on interest and resources. These lessons are used to complement mandatory training.

PO 401–Citizenship

Complementary training for Citizenship provides the cadets an opportunity to describe the youth justice system and discuss age-based laws, federal and provincial jurisdictions, and computer crime.

PO 402–Community Service

Complementary training for Community Service provides the cadets an opportunity to participate in a ceremonial parade and an additional opportunity to perform community service.

PO 403–Leadership

Complementary training for Leadership provides the cadets an opportunity to participate in a leadership seminar, lead a team-building activity, and deliver a presentation on a leader.

PO 404–Personal Fitness and Healthy Living

Complementary training for personal fitness and healthy living provides the cadets an opportunity to describe nutrition and hydration requirements for fitness and sports activities and conduct the cadet fitness assessment.

PO 405–Recreational Sports

Complementary training for recreational sports provides the cadets an opportunity to participate in an organized sports tabloid, an organized intramural sports event, and an orienteering event.

PO 406–Air Rifle Marksmanship

Complementary training for air rifle marksmanship provides the cadets an opportunity to perform the duties of a range assistant, score targets, identify civilian marksmanship organizations, correct marksmanship error, adopt the standing position with the cadet air rifle, practice holding techniques, practice aiming techniques, practice firing techniques and participate in a recreational marksmanship activity.

PO 407–General Cadet Knowledge

Complementary training for general cadet knowledge provides the cadets an opportunity to prepare for a merit review board and describe the application procedure for national courses and exchanges.

PO 408–Drill

Complementary training for drill provides the cadets an opportunity to discuss the history of drill, view a re-enactment that demonstrates the historical use of drill, execute flag party drill, deliver words of command, practice ceremonial drill as a review and execute drill with arms.

PO 409–Instructional Techniques

Complementary training for Instructional Techniques provides the cadets an opportunity to plan a lesson, instruct a 30-minute lesson, act as an assistant instructor, participate in a creative lesson planning workshop, act as an assistant drill instructor, instruct a 30-minute drill lesson, identify formations for drill instruction, plan a drill lesson and instruct a 15-minute drill lesson.

PO 311–Summer Biathlon

Complementary training for summer biathlon provides the cadets an opportunity to practice aiming and firing the cadet air rifle following physical activity, identify civilian biathlon opportunities, run on alternate terrain, fire the cadet air rifle using a sling following physical activity, participate in a competitive summer biathlon activity, participate in a biathlon briefing, run wind sprints, and participate in a recreational summer biathlon activity.

PO 420–CF Familiarization

Complementary training for CF familiarization provides the cadets an opportunity to describe battle honours of Canadian squadrons and identify honours and awards of the Canadian Forces.

PO 429–Radio Communication

Complementary training for radio communication allows the cadets to explain regulations and operating procedures for aviation transmission and licensing, communicate using radio procedures for aviation transmission, describe radio wavelengths, signals, licenses and equipment, explain emergency, urgency and safety communications, and earn an Industry Canada Radio Operator's Certificate - Aviation (ROC-A) license.

PO 431–Principles of Flight

Complementary training for principles of flight provides the cadets an opportunity to explain flight performance factors, demonstrate turns, climbs, and descents in a flight simulator and fly a radio-controlled aircraft.

PO 431–Propulsion

Complementary training for propulsion provides the cadets an opportunity to describe ignition and electrical systems, describe turbocharging and supercharging systems, and describe gas turbine engines.

PO 436–Meteorology

Complementary training for meteorology provides the cadets an opportunity to explain fog, describe severe weather conditions, and analyze weather information.

PO 437–Navigation

Complementary training for Navigation provides the cadets an opportunity to solve navigation problems with a manual flight computer and use a visual flight rules (VFR) navigation chart (VNC).

PO 440–Aerospace

Complementary training for aerospace provides the cadets an opportunity to describe model rocketry, launch a small rocket, discuss characteristics of the planets in the solar system, apply the material science of trusses, describe robotics, use star charts, operate a telescope, watch *BLAST! (balloon-borne large aperture sub-millimetre telescope)*, describe the relationship between gravity and space-time, discuss kinetic and potential energy, and watch *Einstein's Big Idea*.

PO 460–Aerodrome Operations

Complementary training for aerodrome operations provides the cadets an opportunity to describe aerodrome operations career opportunities, describe air traffic control (ATC) career opportunities, and describe airport security career opportunities.

PO 470–Aircraft Manufacturing and Maintenance

Complementary training for aircraft manufacturing and maintenance provides the cadets an opportunity to discuss aircraft manufacturers, discuss aircraft assembly, identify aviation hardware, and disassemble and reassemble a small engine.

PO 490–Aircrew Survival

Complementary training for Aircrew Survival provides the cadets an opportunity to identify seasonal survival factors, improvise tools for use in a survival situation, move a casualty to shelter, practice safe toolcraft, navigate using a map and compass, erect, tear down and pack a tent, and construct a hootchie or lean-to-style shelter.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. As part of Citizenship, what are the EOs (topics) that may be taught?

Q2. What EOs are encompassed under complementary training for Personal Fitness and Healthy Living?

Q3. In Meteorology, what EOs may be taught?

ANTICIPATED ANSWERS:

A1. Describe the youth justice system, discuss age-based laws, discuss federal and provincial jurisdictions and discuss computer crime.

A2. Describe nutrition and hydration requirements for fitness and sports activities, and conduct the cadet fitness assessment.

A3. Explain winds, describe air masses and fronts, explain fog, describe severe weather conditions, and analyze weather information.

Teaching Point 3 **Discuss leadership appointment opportunities at the squadron.**

Time: 5 min Method: Group Discussion

BACKGROUND KNOWLEDGE

The point of the group discussion is to draw the following information from the group using the tips for answering / facilitating discussion and the suggested questions provided.

LEADERSHIP ASSIGNMENT

A leadership assignment is a specific, short- or long-term practical leadership opportunity during which the team leader must apply their leadership skills. The team leader will have temporary team members either within or outside their peer group for whom they will be responsible. The team will accomplish a singular minor duty or task.

Leadership assignments in fourth year may be the same as third year. Each fourth cadet has already completed at least two leadership assignments during their third year of training.

LEADERSHIP APPOINTMENT

Ensure a list of leadership appointments has been developed by the Training Officer before instructing this class. Below is a sample list of leadership appointments.

A leadership appointment is a specific long-term practical leadership opportunity that is more comprehensive in nature than a leadership assignment. The team leader must apply their leadership knowledge and skills and display the core leadership qualities of a cadet. The team leader will have an assigned, established team of cadets outside their peer group. The team will accomplish a singular major duty or task. These may be organizational appointments (eg, Flight Sergeant, Squadron Commander, etc.), training appointments (eg, Proficiency Level Instructor, Leadership and Ceremonial Instructor, etc.) or supplementary appointments (eg, Canteen Steward, Drill Team Commander, etc.). In generating leadership appointments, consideration must be given to the duration of the major duty or task and frequency of opportunities to exercise leadership. The team leader is expected to meet with their team on a number of occasions over a period of time. Leadership appointments may be held by a single PL4 cadet (eg, Drill Team Commander) or the PL4 cadets may rotate through a position (eg, Canteen Steward). If a PL4 cadet rotates through a leadership appointment, the

appointment must be meaningful for the cadet and be of a duration that allows the cadet to meet the objectives of applying their leadership knowledge and skills and displaying the core leadership qualities of a cadet.

The team leader must supervise team members, communicate with team members and solve problems, strive to meet the needs and expectations of team members, motivate team members, and provide feedback to team members. The team leader must attempt to develop the skills and knowledge of their team members.

Direction for the leadership appointment must be given by a superior usually an activity leader or activity manager.

During year four training, each cadet will be assessed at least once on a leadership assignment and once on a leadership appointment.

SAMPLE YEAR FOUR LEADERSHIP APPOINTMENTS

Organizational Appointments

- Flight Sergeant,
- Flight Commander,
- Squadron Commander,
- Drum Major, and
- Flag Party Commander.

Training Appointments

- Proficiency Level Instructor,
- Aviation Subjects Instructor,
- Leadership and Ceremonial Instructor,
- Fitness and Sports and Instructor,
- Air Rifle Marksmanship Instructor,
- Survival Instructor, and
- Band Section Leader.

Supplementary Appointments

- Supply Assistant,
- Administration Assistant,
- Training Assistant,
- Canteen Steward,
- Drill Team Commander,
- Marksmanship Team Captain,
- Range Assistant,
- First Aid Team Captain,

- Biathlon Team Captain, and
- Sports Team Captain.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. How do you think suitability for appointments is determined?

Q2. When is a good time to change a leadership appointment?

Q3. If a cadet is successful in one appointment is it certain that they will be successful in another appointment? Why or why not?

Q4. How do you think succession of a leadership appointment should be prepared?

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

CONFIRMATION OF TEACHING POINT 3

The cadets' participation in the group discussion will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. What drill training opportunities are mandatory under Proficiency Level Four?

Q2. What aerospace training opportunities are mandatory under Proficiency Level Four?

Q3. In Meteorology, what EOs may be taught?

ANTICIPATED ANSWERS:

A1. Drill provides the cadets with opportunities to discuss commanding a flight, identify parade sequence, command a flight on parade, and inspect a cadet on parade.

A2. Aerospace provides the cadets an opportunity to identify aerospace materials and describe Canadian satellites.

A3. Explain winds, describe air masses and fronts, explain fog, describe severe weather conditions, and analyze weather information.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Awareness of the topics to be covered in Proficiency Level Four training will help generate interest in the training year. Awareness of the opportunities available throughout the training year may help motivate you in your specific area(s) of interest.

INSTRUCTOR NOTES / REMARKS

For Proficiency Level Four complementary training opportunities in TP 2, refer to the squadron's annual training plan.

This EO should be scheduled as early as possible in the training year. See the example schedule located at A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 2, Annex B.

REFERENCES

A0-096 CATO 11-04 Director Cadets 3. (2007). *Cadet program outline*. Ottawa, ON: Department of National Defence.

A3-064 CATO 51-01 Director Cadets 3. (2008). *Air cadet program outline*. Ottawa, ON: Department of National Defence.

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PROFICIENCY LEVEL FOUR POs and EOs	
PO 401–Citizenship Recognize How the Legal System Affects Youth	
C401.01	Describe the Youth Justice System
C401.02	Discuss Age-Based Laws
C401.03	Discuss Government Jurisdictions
C401.04	Discuss Computer Crime
PO 402–Community Service Perform Community Service	
M402.01	Perform Community Service
C102.01	Participate in a Ceremonial Parade
C102.02	Perform Community Service
PO 403–Leadership Act as a Team Leader	
M403.01	Describe Needs and Expectations of Team Members
M403.02	Select a Leadership Approach
M403.03	Motivate Team Members
M403.04	Provide Feedback to Team Members
M403.05	Participate in a Mentoring Relationship
M403.06	Act as a Team Leader During a Leadership Appointment
403 PC	
C403.01	Participate in a Leadership Seminar
C303.01	Lead a Team-Building Activity
C303.02	Deliver a Presentation About a Leader
PO 404–Personal Fitness and Healthy Living Update Personal Activity Plan	
M404.01	Participate in the Cadet Fitness Assessment
M404.02	Update Personal Activity Plan
M404.03	Evaluate Personal Activity Plan
C404.01	Describe Nutrition and Hydration Requirements for Fitness and Sports Activities
C404.02	Prepare to Conduct the Cadet Fitness Assessment
C304.01	Participate in the Cadet Fitness Assessment
C304.02	Evaluate Personal Activity Plan
C304.03	Describe Stress
C204.02	Develop a Personal Nutrition Plan
C104.01	Create Team Goals
PO 405–Recreational Sports Participate in Recreational Sports	
M405.01	Participate in Organized Recreational Team Sports
C105.01	Participate in an Organized Sports Tabloid
C105.02	Participate in an Organized Intramural Sports Event
C105.03	Participate in an Orienteering Event

PO 406–Air Rifle Marksmanship Fire the Cadet Air Rifle During Recreational Marksmanship	
M406.01	Participate in a Recreational Marksmanship Activity
C406.01	Assist the Range Safety Officer (RSO)
C406.02	Score Air Rifle MarksmanshipTargets
C306.01	Identify Civilian Marksmanship Organizations
C306.02	Correct Marksmanship Error
C306.03	Adopt the Standing Position With the Cadet Air Rifle
C106.01	Participate in a Recreational Marksmanship Activity
PO 407–General Cadet Knowledge Serve in an Air Cadet Squadron	
M407.01	Discuss Proficiency Level Four Training Opportunities
M407.02	Discuss Year Four Cadet Summer Training Centre (CSTC) Training Opportunities
C407.01	Prepare for a Merit Review Board
C307.01	Participate in a Presentation Given by a Guest Speaker From the Regional Cadet Support Unit (RCSU)
C307.02	Participate in a Presentation Given by the Cadet Liaison Officer (CLO)
C307.03	Participate in a Presentation Given by a Guest Speaker from the Air Cadet League of Canada (ACLC)
C307.04	Identify the Application Procedures for the Glider and Power Scholarships
C307.05	Participate in a Presentation on the Duke of Edinburgh Award Program
PO 408–Drill Command a Flight on Parade	
M408.01	Discuss Commanding a Flight
M408.02	Identify Parade Sequence
M408.03	Command a Squad
M408.04	Inspect a Cadet on Parade
408 PC	
C408.01	Discuss the History of Drill
C408.02	View a Re-Enactment That Demonstrates the Historical Use of Drill
C308.01	Execute Flag Party Drill
C308.02	Deliver Words of Command
C208.01	Practice Ceremonial Drill as a Review
C208.02	Execute Drill With Arms
PO 409–Instructional Techniques Instruct a Lesson	
M409.01	Identify Methods of Instruction
M409.02	Identify Elements of a Positive Learning Environment
M409.03	Describe Learner Needs
M409.04	Explain Assessment
M409.05	Instruct a 30-Minute Lesson
409 PC	
C409.01	Plan a Lesson
C409.02	Instruct a 30-Minute Lesson
C409.03	Act as an Assistant Instructor
C409.04	Participate in a Creative Lesson Planning Workshop

C409.05	Act as an Assistant Drill Instructor
C409.06	Instruct a 30-Minute Drill Lesson
C309.04	Identify Formations for Drill Instruction
C309.05	Plan a Drill Lesson
C309.06	Instruct a 15-Minute Drill Lesson
PO 311–Summer Biathlon Participate in a Recreational Summer Biathlon Activity	
C311.01	Practice Aiming and Firing the Cadet Air Rifle Following Physical Activity
C311.02	Participate in a Recreational Summer Biathlon Activity
C211.01	Identify Civilian Biathlon Opportunities
C211.02	Run on Alternate Terrain
C211.03	Fire the Cadet Air Rifle Using a Sling Following Physical Activity
C211.04	Participate in a Competitive Summer Biathlon Activity
C111.01	Participate in a Biathlon Briefing
C111.02	Run Wind Sprints
C111.03	Fire the Cadet Air Rifle Following Physical Activity
C111.04	Participate in a Recreational Summer Biathlon Activity
PO 420–CF Familiarization Describe Canadian Air Force Traditions	
M420.01	Describe Canadian Air Force Traditions
M420.02	Identify Royal Canadian Air Force (RCAF) Ranks
C420.01	Describe Battle Honours of Canadian Squadrons
C420.02	Identify Honours and Awards of the Canadian Forces
PO 429–Radio Communication Communicate Using Radio Procedures for Aviation Transmission	
C429.01	Explain Regulations and Operating Procedures for Aviation Transmission and Licensing
C429.02	Communicate Using Radio Procedures for Aviation Transmission
C429.03	Describe Radio Wavelengths, Signals, Licences and Equipment
C429.04	Explain Emergency, Urgency and Safety Communications
429 PC	Industry Canada ROC-A
PO 431–Principles of Flight Explain Principles of Flight	
M431.01	Explain Features of Wing Design
M431.02	Describe Flight Instruments
C431.01	Explain Flight Performance Factors
C431.02	Demonstrate Turns, Climbs, and Descents in a Flight Simulator
C431.03	Fly a Radio-Controlled Aircraft
PO 432–Propulsion Describe Aero Engine Systems	
M432.01	Describe Fuel Systems
M432.02	Describe Propeller Systems
M432.03	Describe Engine Instruments
C432.01	Describe Ignition and Electrical Systems
C432.02	Describe Turbocharging and Supercharging Systems
C432.03	Describe Gas Turbine Engines

PO 436–Meteorology Explain Aspects of Meteorology	
M436.01	Explain Winds
M436.02	Describe Air Masses and Fronts
C436.01	Explain Fog
C436.02	Describe Severe Weather Conditions
C436.03	Analyze Weather Information
PO 437–Navigation Explain Aspects of Air Navigation	
M437.01	Define Air Navigation Terms
M437.02	Describe the Magnetic Compass
431 / 432 436 / 437 PC	Aviation Subjects–Combined Assessment
C437.01	Solve Navigation Problems with a Manual Flight Computer
C437.02	Use a Visual Flight Rules (VFR) Navigation Chart (VNC)
PO 440–Aerospace Discuss Aerospace Structures	
M440.01	Identify Aerospace Materials
M440.02	Describe Canadian Satellites
C440.01	Describe Model Rocketry
C440.02	Launch a Small Rocket
C440.03	Discuss Characteristics of the Planets in the Solar System
C440.04	Apply the Material Science of Trusses
C440.05	Describe Robotics
C440.06	Use Star Charts
C440.07	Operate a Telescope
C440.08	Watch *BLAST! (Balloon-Borne Large Aperture Sub-Millimetre Telescope)*
C440.09	Describe the Relationship Between Gravity and Space-Time
C440.10	Discuss Kinetic and Potential Energy
C440.11	Watch *Einstein's Big Idea*
PO–460 Aerodrome Operations Describe Aerodrome Operations Career Opportunities	
C460.01	Describe Aerodrome Operations Career Opportunities
C460.02	Describe Air Traffic Control (ATC) Career Opportunities
C460.03	Describe Airport Security Career Opportunities
PO–470 Aircraft Manufacturing and Maintenance Discuss Aspects of Aircraft Manufacturing and Maintenance	
C470.01	Discuss Aircraft Manufacturers
C470.02	Discuss Aircraft Assembly
C470.03	Identify Aviation Hardware
C470.04	Disassemble and Reassemble a Small Engine

PO–490 Aircrew Survival Participate in an Aircrew Survival Exercise	
M490.01	Assemble an Emergency Survival Kit
M490.02	Operate a Stove and a Lantern
M490.03	Tie Knots and Lashings
M490.04	Navigate to a Waypoint Using a Global Positioning System (GPS) Receiver
M490.05	Light Fires Using Improvised Ignition
490 PC	
C490.01	Identify Climatic and Seasonal Concerns
C490.02	Improvise Tools for Use in a Survival Situation
C490.03	Move a Casualty to Shelter
C490.04	Practice Safe Toolcraft
C490.05	Navigate a Route Using a Map and Compass
C490.06	Erect, Tear Down and Pack a Tent
C490.07	Construct a Hootchie or Lean-to-Style Shelter

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ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 2

EO M407.02 – DISCUSS YEAR FOUR CADET SUMMER TRAINING CENTRE (CSTC) TRAINING OPPORTUNITIES

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Read CATO 51-01, *Air Cadet Program Outline*.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

A group discussion was chosen for TP 1 as it allows the cadets to interact with their peers and share their experiences, opinions, and feelings about year four CSTC training opportunities.

An interactive lecture was chosen for TP 2 to orient the cadets to the choices for year four CSTC training opportunities and to generate interest in the subject.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have discussed year four CSTC training opportunities.

IMPORTANCE

It is important for cadets to identify the year four CSTC training opportunities available to them because it may help them decide if and for which course they would like to apply.

Teaching Point 1 **Discuss the areas of interest of CSTC training opportunities.**

Time: 10 min Method: Group Discussion

BACKGROUND KNOWLEDGE

The point of the group discussion is to draw the following information from the group using the tips for answering / facilitating discussion and the suggested questions provided.

Write the specialty areas on a whiteboard / flip chart. Explain the activities that are conducted within each area.

FITNESS AND SPORTS

Cadets will improve individual fitness and sport knowledge and skills. Activities will focus on:

- officiating,
- fitness instruction,
- sports leadership,
- coaching,
- rules and regulations of sports, and
- personal fitness.

MUSIC

Military Band Musician

Cadets will develop music knowledge and skills. Activities will focus on:

- music theory;
- playing an instrument as part of an ensemble;
- playing an instrument as part of a military band; and
- developing individual music skills.

Pipe Band Musician

Cadets will develop music knowledge and skills. Activities will focus on:

- music theory;
- playing an instrument as part of an ensemble;

- playing an instrument as part of a pipe and drum band; and
- developing individual music skills.

MARKSMANSHIP

Cadets will develop the knowledge and skills required to improve marksmanship and coaching abilities. Activities will focus on:

- recreational and competitive air rifle marksmanship,
- various marksmanship techniques,
- firing positions,
- duties of a range assistant, and
- basic duties of a marksmanship coach.

LEADERSHIP

Cadets will develop the knowledge and skills required to improve leadership abilities in a peer and small group setting. Activities will focus on:

- leadership,
- supervision,
- team-building,
- instructional techniques,
- effective communication,
- problem solving, and
- ceremonial drill.

AVIATION

Cadets will develop the knowledge and skills required to improve their understanding of the fundamentals of aviation. Depending on the course chosen, activities will focus on:

- pilot training,
- meteorology,
- aero engines,
- air navigation,
- airmanship,
- principles of flight,
- navigation,
- pilot decision making,
- air law,

- flight safety, and
- aviation medicine.

AVIATION TECHNOLOGY

Cadets will develop knowledge and skills required to improve their understanding of the fundamentals of aviation technology. Depending on the course chosen, activities will focus on:

- aerodrome operations,
- aircraft fabrication,
- aircraft construction, and
- aircraft maintenance.

AEROSPACE

Cadets will develop knowledge and skills required to improve their understanding of the fundamentals of aerospace science. Activities will focus on:

- theoretical and practical principles of space science,
- simulations of life in space,
- familiarization with recognized space missions, and
- history of space exploration.

AIRCREW SURVIVAL

Cadets will develop the knowledge and skills required to improve aircrew survival skills. Activities will focus on:

- instructional techniques in the field,
- map and compass for ground navigation,
- leadership in a field setting,
- fire construction,
- shelter construction,
- signal construction, and
- food and water collection.

STAFF CADET ADVANCED TRAINING

Staff cadets may not be less than 16 years of age as of the first day of January of the year of advanced training. Staff cadets are not employees. Participation by the staff cadet during authorized CSTC summer training constitutes advanced training.

Cadets can find more information about staff cadet advanced training at CATO 13-28, *Advanced Training–Staff Cadets*.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet.
- This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. Which areas of interest in summer training appeal to you? Why?

Q2. Who is interested in applying for summer training this year? Why?

Q3. What extra-curricular CSTC activities did you most enjoy during previous summers? Why?

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the group discussion will serve as the confirmation of this TP.

Teaching Point 2 **Explain the choices for year four CSTC training opportunities.**

Time: 15 min Method: Interactive Lecture

ALL SIX WEEK COURSES OFFERED WITHIN EACH AREA OF COMMON INTEREST

Fitness and Sports Instructor

The aim of the Fitness and Sports Instructor course is to enhance skills developed previously, to develop leadership and instructional skills in fitness and sports settings, and to stimulate further interest in personal fitness and healthy living.

Air Rifle Marksmanship Instructor

The aim of the Air Rifle Marksmanship Instructor course is to enhance skills developed during proficiency level training and previous CSTC training. As well, cadets will develop leadership, coaching, and instructional skills in a marksmanship setting.

Military Band – Advanced Musician

The aim of the Military Band – Advanced Musician course is to enhance knowledge and skills developed during previous music courses, and to develop leadership skills in a military band setting.

Pipe Band – Advanced Musician

The aim of the Pipe Band – Advanced Musician course is to enhance knowledge and skills developed during previous music courses, and to develop leadership skills in a pipe band setting.

ALL SIX WEEK COURSES OFFERED WITHIN EACH ELEMENTAL-SPECIFIC AREA

Leadership and Ceremonial Instructor

The aim of the Leadership and Ceremonial Instructor course is to enhance leadership and ceremonial skills, to develop leadership and instructional skills, and to stimulate further interest in leadership and ceremonial practices.

Survival Instructor

The aim of the Survival Instructor course is to enhance survival skills developed previously, to develop new survival skills, and to develop leadership and instructional skills in a survival / field setting.

Advanced Aerospace

The aim of the Advanced Aerospace course is to enhance aerospace knowledge developed previously, develop new knowledge and skills, and further stimulate an interest in the aerospace / astronomy topics.

Advanced Aviation Technology – Airport Operations

The aim of the Advanced Aviation Technology – Airport Operations course is to enhance knowledge developed previously, develop new knowledge and skills, and further stimulate an interest in airport operations.

Advanced Aviation Technology – Aircraft Maintenance

The aim of the Advanced Aviation Technology – Aircraft Maintenance course is to enhance knowledge developed previously, develop new knowledge and skills, and further stimulate an interest in aircraft maintenance.

Glider Pilot Scholarship (GPS)

The aim of the GPS is to train the successful applicant to the standard as defined in the A-CR-CCP-242/PT-005, *Air Cadet Gliding Manual*. Upon graduation from the course, cadets will be awarded their Air Cadet Glider wings and a Transport Canada Pilot Licence - Glider.

Power Pilot Scholarship (PPS)

The PPS Program is a seven-week course of ground and flying training designed to qualify air cadets for a Transport Canada Private Pilot Licence IAW Canadian Air Regulations. Training is conducted by member flying schools or clubs of either the Air Transport Association of Canada or l'Association québécoise des transporteurs aériens.

THREE-WEEK ADVANCED AVIATION COURSE

The Advanced Aviation course is the only three-week course offered with the completion of Proficiency Level Three. The aim of this course is to enhance the cadet's knowledge of aviation subjects and to further stimulate an interest in becoming a pilot.

PREREQUISITES FOR EACH THREE- AND SIX-WEEK COURSE

For all courses other than the GPS, PPS and Advanced Musician courses, the cadet must:

- be undergoing Proficiency Level Three training by the application deadline;
- successfully complete Proficiency Level Three by June 30 of the year the cadet wishes to attend the CSTC;
- be physically fit;
- complete a Summer Training Application Form;
- have parental consent; and
- be recommended by the squadron Commanding Officer.

Cadets do not have to complete a year three CSTC course to apply for year four CSTC courses.

For more information on the GPS and PPS courses, see EO C307.04 (Identify the Application Procedure for the Glider and Power Pilot Scholarships).

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What are the five 6-week courses offered in areas of common interest?

Q2. What is the only three-week course offered during year three or four summer training?

Q3. What are the prerequisites for three- and six-week courses other than the PPS?

ANTICIPATED ANSWERS:

A1. Leadership and Ceremonial Instructor, Fitness and Sports Instructor, Air Rifle Marksmanship Instructor, Military Band–Intermediate Musician, and Pipe Band–Intermediate Musician.

A2. The Advanced Aviation course.

A3. For all courses other than the PPS, the cadet must:

- be undergoing Proficiency Level Three training by the application deadline;
- successfully complete Proficiency Level Three by June 30 of the year the cadet wishes to attend the CSTC;
- be physically fit;
- complete a Summer Training Application Form;
- have parental consent; and
- be recommended by the squadron Commanding Officer.

END OF LESSON CONFIRMATION

The cadets' participation in the group discussion will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Summer training is a fun and exciting aspect of the cadet program. CSTCs are also a place to meet cadets and make new friends from different squadrons across Canada. It is important to be familiar with the CSTC training opportunities offered to be able to apply for courses of interest.

INSTRUCTOR NOTES / REMARKS

This EO should be conducted before the summer training application deadline.

It is recommended that the summer training application forms be completed during a training session after this EO has been conducted.

REFERENCES

A0-010 CATO 11-04 Director Cadets 2. (2007). *Cadet program outline*. Ottawa, ON: Department of National Defence.

A0-033 CATO 14-21 Director Cadets 3. (2004). *Music training and education with the Canadian cadet organizations*. Ottawa, ON: Department of National Defence.

A0-128 CATO 13-28 Director Cadets 2. (2006). *Advanced training–Staff cadets*. Ottawa, ON: Department of National Defence.

A3-029 CATO 51-01 Director Cadets 3. (2006). *Air cadet program outline*. Ottawa, ON: Department of National Defence.

A3-061 CATO 54-27 Director Cadets 4. (2007). Power pilot scholarship program. Ottawa: ON: Department of National Defence.

A3-192 CATO 54-26 Director Cadets 4. (2007). *Glider Pilot Scholarship Program*. Ottawa, ON: Department of National Defence.

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ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 3

EO C407.01 – PREPARE FOR A MERIT REVIEW BOARD

Total Time:	90 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Prepare to conduct merit review boards IAW CATO 13-02, *Cadet Rank Promotions*.

The practice merit review board in TP 3 should be composed of adults who have competent interview skills (officers, civilian instructors and volunteers). Senior cadets should only be used as a last resort.

Obtain the materials for conducting a merit review board for a promotion interview.

Prepare interview questions, marking sheets and candidate scoring sheets (to be created locally) for TP 3.

Arrange for assistant instructors for TP 3.

Obtain a copy of CATO 13-02, *Cadet Rank Promotions*, for each member of the merit review board for promotion.

Photocopy Attachments A and B for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TPs 1 and 2 to present preparations for merit review boards and to summarize the teaching points.

An in-class activity was chosen for TP 3 as it is an interactive way to provoke thought and stimulate interest among the cadets.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to prepare for a merit review board.

IMPORTANCE

It is important for cadets to prepare for a merit review board to help them succeed in gaining opportunities through competitive application processes.

Teaching Point 1 **Identify occasions requiring a merit review board.**

Time: 5 min Method: Interactive Lecture

Merit review boards have two important benefits:

- they provide selection recommendations that are fair and open, and
- they provide cadets with a valuable life skill.

Opportunities to conduct merit review boards include:

- promotions,
- awards,
- scholarships, and
- Cadet Summer Training Centre (CSTC) training opportunities, and
- CSTC staff appointments.

PROMOTIONS

CATO 13-02, *Cadet Rank Promotions*, is the authority for this training.

Promotions to higher cadet ranks and appointments within the squadron provide opportunities for merit review boards. Promotion merit review boards have many benefits for the squadron, including:

- giving the candidates incentive to learn details of the rank or appointment responsibilities;
- ensuring that the best candidate is selected; and
- satisfying all members of the squadron that the best available cadet is leading them.

AWARDS

Some squadrons may conduct a merit review board for important awards. Most often, recommendations for awards are made by a board of staff members who are familiar with the work of all candidates. In all cases, recommendations are given to the CO. The CO is the final arbiter of awards.

SCHOLARSHIPS

Scholarship candidates are often selected by the person or entity that is providing the scholarship funding. Squadrons may choose to hold a merit review board for such a purpose.

CSTC TRAINING OPPORTUNITIES

When a squadron has multiple excellent candidates for a limited number of course spaces, selection of candidates must be done in an open manner. The CO requires recommendations that are both unbiased and clearly seen to be unbiased. While staff members can and often do provide effective recommendations, the merit review board provides an unbiased option.

CSTC STAFF APPOINTMENTS

When staff cadets arrive at a CSTC prior to the start of summer training, they may be interviewed by a board. This usually takes one of two forms:

- cadets are interviewed by a panel of officers to determine which CSTC position they are most suited; and
- senior cadets are interviewed by a merit review board for warrant officer positions.

In either case, the interview skills learned at a squadron will prove vital to the cadet.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What are two important benefits of merit review boards?

Q2. What are five occasions in which a cadet might encounter a merit review board?

Q3. What benefit does a squadron get from holding promotion merit review boards?

ANTICIPATED ANSWERS:

A1. Merit review boards have two important benefits:

- providing selection recommendations that are fair and open; and
- providing cadets with a valuable life skill.

A2. A cadet might encounter a merit review board for:

- promotions,
- awards,
- scholarships,
- CSTC training opportunities, and
- CSTC staff appointments.

A3. Promotion merit review boards have many benefits for the squadron, to include:

- giving the candidates incentive to learn details of the rank or appointment responsibilities;
- ensuring that the best candidate is selected; and
- satisfying all members of the squadron that the best available cadet is leading them.

Teaching Point 2 **Describe how to prepare for a merit review board for promotion and tips for a successful interview.**

Time: 20 min Method: Interactive Lecture

HOW TO PREPARE FOR A MERIT REVIEW BOARD FOR PROMOTION

A candidate for a merit review board for promotion should:

- think about potential questions that could be asked and prepare answers to these questions;
- talk to others who have been through the process to find out what to expect; and
- participate in any opportunity to practice for a board, such as practice merit review boards.

Dress Requirements

The interview candidate shall identify dress requirements ahead of their interview. The uniform must be worn in accordance with the cadet dress instructions in the relevant Cadet Administration and Training Order (CATO). Dress shall be maintained to a high standard.

TIPS FOR A SUCCESSFUL INTERVIEW

Importance of Bearing

Many candidates exhibit high standards of dress and high levels of knowledge. The final selections will therefore be based partly on the winning candidates' bearing.

Unless given other instructions, the candidate will enter facing the board, wearing headdress, and salute. Wait until offered a seat and remove headdress when seated.

During the interview, do nothing that may distract the interviewers, to include:

- biting one's lips;
- squirming;
- scratching;
- chewing gum;
- twisting fingers;
- playing with hair;
- checking the time;
- yawning—make sure to have a good night's sleep before the interview; and
- taking anything into an interview that has any chance of distracting the interviewers.

Hand gestures while speaking may also distract interviewers.

Sit with an open posture and legs and arms uncrossed.

The members of the board want the cadet to feel comfortable and relaxed. Try to be so, while maintaining respect and decorum. A confident candidate sits up straight, calmly looking the interviewer straight in the eye without fidgeting. Nodding or shaking the head does not constitute an answer of any kind. All replies must be verbal.

Candidates must be prepared to introduce themselves.

Remember that the interviewers are also going through a process for which they have made long preparations and to which they attach great importance. The candidate being interviewed is, in many ways, part of a team that includes the interviewers. All members of this team are expected to maintain respect, decorum and friendliness.

When the interview is completed, stand, replace headdress, make firm eye contact, salute, and smartly depart the room. The board members may or may not offer to shake hands. Follow their lead.

Merit Review Board for Promotion Questions

Distribute a copy of Attachment A to each cadet.

IAW CATO 13-02, *Cadet Rank Promotions*, question areas at a merit review board for promotion may include:

- candidates recounting their achievements through cadet training (eg, squadron program, CSTC program);
- candidates explaining what previous positions of leadership they have held (eg, at cadets, at school) and how they performed in related situations;
- personal goals and / or their goals for the squadron;
- scenario-based questions that relate to typical squadron situations where the candidate shares how they might approach / deal with the situation; and
- candidate achievements outside of the cadet squadron setting (eg, at school, in their community, sports teams, extracurricular activities).

Candidates are expected to take their time when formulating answers but the answer should be as direct as possible. Ask for clarification when necessary. A comprehensively correct answer, formulated carefully and delivered in a relaxed, friendly manner is best.

If the candidate does not know the answer to a question it is best to say so, in as direct a manner as possible, so the interviewer moves on to another topic where the candidate has better knowledge. This will help minimize both the psychological impact of the missing information and the damage to the candidate's mark. Shoulders must never be shrugged during an interview.

Distribute a copy of Attachment B to each cadet.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. How will a candidate know which uniform to wear for a merit review board interview?

Q2. When should a candidate take a seat in an interview?

Q3. What should candidates say if the answer to a question is unknown?

ANTICIPATED ANSWERS:

A1. The interview candidate shall identify dress requirements ahead of their interview.

A2. When offered a seat.

A3. It is best to say they do not know, in as direct a manner as possible.

Teaching Point 3 **Have the cadets participate in a practice merit review board based on the instructions given in TP 2.**

Time: 55 min Method: In-Class Activity

The practice merit review board should be composed of adults who have competent interview skills (officers, civilian instructors and volunteers). Senior cadets should only be used as a last resort.

ACTIVITY

OBJECTIVE

The objective of this activity is to have the cadets participate in a practice merit review board.

RESOURCES

- Annex B of CATO 13-02, *Cadet Rank Promotions*,
- Questions for each type of practice merit review board for promotion, prepared locally,
- Marking sheets designed for the locally-prepared questions,
- Candidate scoring sheets, prepared locally,
- Electronic calculator,
- List of practice merit review board candidates showing the type of board, and
- Pens / pencils.

ACTIVITY LAYOUT

In a quiet room:

- place a table and a chair for each interviewer and one chair facing the merit review board for the candidate;
- arrange the lighting to provide the interviewers with a good view of the candidate;
- have the candidate's back to any window or opening to avoid distraction;
- arrange a secure holding area for candidates prior to their interview;
- arrange a separate holding area for candidates following their interview; and
- arrange for a messenger to bring each candidate for their interview as directed by the merit review board.

ACTIVITY INSTRUCTIONS

1. Introduce the practice merit review board members to their room before the activity begins.
2. Ensure that each practice merit review board member has individual resources as needed.
3. Introduce the messenger to the practice merit review board.
4. Explain that the board members will tell the messenger when to bring each candidate.
5. Explain that candidates will be guided to a separate holding area after being interviewed.
6. Have the practice merit review board interview each candidate using the prepared questions.
7. Ensure that there is no contact between candidates who have completed the interview and those who are still waiting.
8. When all candidates have been interviewed, have the board members debrief each candidate individually.
9. Allow each candidate to keep the marking sheets.
10. When all candidates have been interviewed and debriefed, thank the members of the practice merit review board for their time and effort.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 3

The cadets' participation in the activity will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' participation in the practice merit review board will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Have the cadets prepare for a merit review board.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Effective preparation for merit review boards will help you obtain important opportunities. These skills will also prove invaluable throughout life.

INSTRUCTOR NOTES / REMARKS

Cadets will be given scenarios to prepare for a merit review board at the end of TP 2.

In the future, some nationally directed and regionally directed activities may require merit review boards.

When scheduling this lesson, allow at least two weeks between TPs 2 and 3.

REFERENCES

A0-133 CATO 13-02 Director Cadets 3. (2008). *Cadet rank promotions*. Ottawa, ON: Department of National Defence.

A3-006 CATO 55-04 Director Cadets 3. (2005). *Air cadet dress instructions*. Ottawa, ON: Department of National Defence.

C0-416 Air Cadet League of Canada BC Committee (2009). *Sponsoring committee resources: Mock boards*. Retrieved March 4, 2009, from http://www.aircadetleague.bc.ca/SponCommResources/Mock_Boards.PDF

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EXAMPLE QUESTIONS TO EXPECT AT A MERIT REVIEW BOARD FOR PROMOTION

Question areas may include:

- your achievements through cadet training (eg, squadron program, CSTC program);
- previous positions of leadership held (eg, at cadets, at school) and your performance in related situations;
- personal goals and / or your goals for the squadron;
- achievements outside of the cadet squadron setting (eg, at school, in the community, sports teams, extra-curricular activities), and
- scenario-based questions that relate to typical squadron situations and how you might approach / deal with the situation.

All candidates will be asked the same questions, which could be similar to the following examples:

- Describe your current squadron responsibilities.
- Describe your involvement in squadron teams, band and drill, flag party or clubs.
- What leadership positions have you held in any organization?
- What do you consider your own strengths / weaknesses?
- If you had to change something about yourself, what would it be?
- How did you become interested in the cadet movement?
- On an average evening, how much time do you dedicate to homework?
- For what do you use your home computer? (eg, games, research, emails)
- Where are you headed in life?
- Do you plan to take any post-secondary school education?
- What discipline or education do you wish to pursue?
- Do you have a part-time job and, if so, does it compete with cadets or school?
- What community related-activities do you participate in?
- What targets have you set for your personal growth or improvement?
- Do you participate in any organized school teams / groups (eg, band, football)?
- Are you involved with any citizenship activities in your community outside of cadets?
- Do you have any hobbies?
- Scenario-based questions:
    - You have been given responsibility for a group of cadets, some of whom require motivation in uniform care. What will you do?
    - You are in charge of drill instruction and one of your assistant instructors keeps touching cadets when correcting them, despite your instructions to not touch. What do you do?

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PREPARATION FOR A MERIT REVIEW BOARD FOR PROMOTION

A candidate for a merit review board for promotion should:

- think about potential questions that could be asked and prepare answers to these questions;
- talk to others who have been through the process to find out what to expect; and
- participate in any opportunity to practice for a board, such as practice merit review boards.

Dress Requirements

The interview candidate shall identify dress requirements well ahead of their interview. The uniform must be worn in accordance with the cadet dress instructions in the relevant Cadet Administration and Training Order (CATO). Dress shall be maintained to a high standard.

TIPS FOR A SUCCESSFUL INTERVIEW

Importance of Bearing

Many candidates will exhibit high standards of dress and high levels of knowledge. The final selections will therefore be based partly on the winning candidates' bearing.

Unless given other instructions, the candidate will enter facing the board, wearing headdress, and salute. Wait until offered a seat and remove headdress when seated.

During the interview, do nothing that may distract the interviewers, to include:

- biting one's lips;
- squirming;
- scratching;
- chewing gum;
- twisting fingers;
- playing with hair;
- checking the time;
- yawning—make sure to have a good night's sleep before the interview; and
- taking anything into an interview that has any chance of distracting the interviewers.

Hand gestures while speaking will also distract interviewers, making a negative impression.

Sit with an open posture and legs and arms not crossed.

The members of the board want the cadet to feel comfortable and relaxed. Try to be so, while maintaining respect and decorum. A confident candidate will sit up straight, calmly looking the interviewer straight in the eye without fidgeting. Nodding or shaking the head does not constitute an answer of any kind. All replies must be verbal.

Candidates must be prepared to say some introductory words about themselves.

Remember that the interviewers are also going through a process for which they have made long preparations and to which they attach great importance. The candidate being interviewed is, in many ways, part of a team which includes the interviewers. All members of this team are expected to maintain respect, decorum and friendliness.

When the interview is completed, stand, replace headdress, make firm eye contact, salute, and smartly depart the room. The board members may or may not offer to shake hands. Follow their lead.

If the candidate does not know the answer to a question it is best to say so in as direct a manner as possible so the interview moves on to another topic where the candidate has better knowledge. This will minimize both the psychological impact of the missing information and the damage to the candidate's mark. Shoulders must never be shrugged during an interview.

COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 1

EO M408.01 – DISCUSS COMMANDING A FLIGHT ON PARADE

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy CATO 55-04, *Air Cadet Dress Regulations*, for every three cadets, for reference during the group discussion.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

A group discussion was chosen for this lesson as it allows the cadets to interact with their peers and share their knowledge and opinions about commanding a flight on parade. Sharing in the discussion encourages the cadets to examine their own thoughts and feelings and may prompt them to re-examine their previously held ideas. Participating in a group discussion improves the cadets' listening skills and team development.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have discussed commanding a flight on parade.

IMPORTANCE

It is important for cadets to discuss commanding a flight on parade in a professional and confident manner as their performance can positively influence the cadets within the flight. It is important to be aware of the key attributes required to successfully command a flight while on the parade square, such as maintaining a high standard of appearance, presence and bearing.

Teaching Point 1 **Discuss commanding a flight on parade.**

Time: 25 min Method: Group Discussion

BACKGROUND KNOWLEDGE

The point of the group discussion is to draw the following information from the group using the tips for answering / facilitating discussion and the suggested questions provided.

Proficiency Level Four cadets will be given opportunities to fill various parade appointments (eg, Flight Commander, Flight Sergeant). The term team leader has been used throughout this EO to encompass any position.

COMMANDING A FLIGHT ON PARADE

The aim of drill is to contribute to the operational effectiveness of the Cadet Program. This aim can be achieved by ensuring cadets march and manoeuvre on the parade square as one unit and by promoting discipline, alertness, precision, pride and the cohesion necessary for success.

Communicating Effectively

As the team leader, there will be various occasions when effective communication will be required, such as when:

- communicating drill commands; and
- speaking to the flight, in a more informal method.

When speaking to cadets in a flight, clear and positive communication is necessary to aid in achieving the aim of drill. Profanity, personal sarcasm or negative comments shall never be used.

When calling drill commands, the team leader must develop and use a vocabulary of short, concise words to impress on the flight that the movement must be performed smartly. When communicating or referring to drill commands and movements, words to use could include:

- sharp,
- crack,
- drive,
- seize, and
- grasp.

Sharp drill movements are dependent on the words of command being properly delivered. Words of command are to be pronounced clearly and distinctly, with confidence and determination, since they convey an order which is to be promptly obeyed.

When correcting errors, the team leader is to address the cadet in a positive tone. The most effective way to correct errors is to explain and demonstrate the correct method and then have the cadet(s) complete the movement(s) the correct way while being observed. This allows the cadet to learn from their error(s).

Executing Sharp Personal Drill

Team leaders must execute all drill movements confidently, correctly and smartly. The characteristics of drill are efficiency, precision and dignity and these qualities are developed through self-discipline and practice.

Team leaders who display constant proficiency in drill are recognized throughout the Cadet Program as highly trained, well-disciplined and professional. Well executed drill develops individual pride, mental alertness, precision and esprit-de-corps. It also sets the standard for the completion of parades and builds a sense of confidence between the team leader and cadet that is essential to high morale.

Maintaining Dress IAW Dress Instructions

Team leaders shall be well groomed with footwear cleaned and shone. The uniform shall be clean and properly pressed at all times.

Dress instructions help ensure a positive image and a high standard of dress are consistent among all cadets when in uniform. Showcasing a high standard of personal dress, appearance and grooming will aid in exhibiting confidence and reflect that the team leader has knowledge of the dress instructions.

Refer to CATO 55-04, *Air Cadet Dress Regulations* for further information on dress standards.

Exhibiting a Positive Attitude

Team leaders should always exhibit a positive attitude toward the members of the flight while on the parade square because a positive attitude will encourage the cadets to want to follow the example set by the team leader.

The positive attitude taught and developed on and off the parade square must be maintained by the team leader at all times.

Conducting Oneself in an Appropriate Manner

As the team leaders are expected to set the example for the flight, it is important to project an image of discipline and self-control.

Chewing gum, slouching, sauntering, placing hands in pockets and similar deportment that detracts from a proud and orderly appearance are unacceptable for team leaders.

The appearance, presence and bearing of the team leader must be of the highest standard since this example may be imitated by the cadets within the flight.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. What attributes do you expect from a person when they are commanding a flight? Why?

Q2. As a member of a flight, what were some of the positive attributes that you noticed / remember about your team leader they were on the parade square?

Q3. What are some leadership competencies you have noticed in the past as a member of a flight? What competencies should you exhibit when commanding a flight on parade?

Q4. Have you ever commanded a flight on parade? If so, what did you learn from this experience(s)? What went well when you commanded a flight on parade? What did not go well when you commanded a flight on parade?

Q5. Why is it important to communicate effectively to the cadets within the flight when commanding a flight on parade?

Q6. Why is it important to exhibit a positive attitude when commanding a flight on parade?

Q7. As a team leader it is important to maintain a positive attitude and a high standard of dress? Why?

Write the mentioned / discussed topics on a flip chart and display them for the cadets so they can refer to them.

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the group discussion will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' participation in the group discussion will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

When assigned to command a flight on parade it is important to conduct oneself with professionalism and confidence. A team leader who portrays a high standard of appearance, presence and bearing positively affects how cadets conduct themselves and respond to orders that are given on the parade square.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

A0-002 A-PD-201-000/PT-000 Director History and Heritage 3-2. (2005). *The Canadian Forces manual of drill and ceremonial*. Ottawa, ON: Department of National Defence.

A3-006 CATO 55-04 Director Cadets 3. (2005). *Air cadet dress instructions*. Ottawa, ON: Department of National Defence.

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 2

EO M408.02 – IDENTIFY PARADE SEQUENCE

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy the parade sequence from A-CR-CCP-801/PF-001, *Proficiency Level One Instructional Guides*, Chapter 8, Section 13, Annex A, PO 108 (Participate in an Annual Ceremonial Review [ACR] Parade), to distribute during TP 2 to each cadet.

Photocopy the ACR sequence from A-CR-CCP-801/PF-001, *Proficiency Level One Instructional Guides*, Chapter 8, Section 13, Annex D, PO 108 (Participate in an ACR Parade) to distribute during TP 3 as a reference for every three cadets.

Review any regional orders regarding conducting ACR parades.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to orient the cadets to the parade sequences of a parade night and an ACR.

INTRODUCTION

REVIEW

The review for this lesson is from EO M408.01 (Discuss Commanding a Flight on Parade).

QUESTIONS:

Q1. What are some examples of communicating effectively when commanding a flight on parade?

Q2. What attributes should a cadet demonstrate when commanding a flight on parade?

Q3. What are some important aspects of your dress to follow / maintain when commanding a flight on parade?

ANTICIPATED ANSWERS:

A1. When speaking to cadets in a flight, clear and positive communication is necessary to aid in achieving the aim of drill. When commanding a flight on parade, the team leader must develop and use a vocabulary of short, concise words to impress on the flight that the movement must be performed smartly.

A2. Some of the attributes would include:

- communicating effectively;
- executing sharp personal drill;
- maintaining dress IAW dress instructions;
- exhibiting a positive attitude; and
- conducting oneself in an appropriate manner.

A3. Team leaders shall be well groomed with footwear cleaned and shone. The uniform shall be clean and properly pressed at all times.

OBJECTIVES

By the end of this lesson the cadet shall have identified the parade sequence of a parade night and an ACR.

IMPORTANCE

It is important for cadets to know the sequence of a parade night's opening and closing parades and an ACR as they will be in placed in a team leader role and will need to know the commands, formations and locations of all members on the parade square. Cadets will be looking to their team leader for guidance during a parade night's opening and closing parades and during an ACR.

Teaching Point 1 **Discuss the roles of parades within the Cadet Program.**

Time: 5 min Method: Interactive Lecture

This TP is intended to introduce the many parades that may be conducted within the Cadet Program.

Cadet squadrons may have specific traditions that they follow for some of their parades.

ROLES OF PARADES WITHIN THE CADET PROGRAM

The purpose of parades is to move cadets in an orderly and efficient manner using precise movements required for displays and ceremonies. Parades also showcase the cadets' knowledge of drill to spectators.

Parade Night

Cadet squadrons conduct an opening and closing parades most times when they meet for training, as it allows cadets to take attendance, practice drill and inspect uniforms. These parades also provide an excellent opportunity for announcements, presentation of awards and promotions. Opening and closing parades usually follow the ACR sequence, allowing cadets to learn the ACR sequence throughout the training year.

ACR

Each year, cadet squadrons are required to conduct an ACR parade. The ACR parade provides an opportunity for cadet squadrons to showcase what they have learned that year and to demonstrate their grasp of drill for family, friends and the community.

Remembrance Day

Every year on November 11, Canadians gather at memorials from coast to coast to remember those who have lost their lives in war or peacekeeping missions. Cities across Canada host Remembrance Day ceremonies and are usually attended by government officials, veterans, serving military members, police, cadets and the general public. At a Remembrance Day ceremony, cadet squadrons may march in the parade or provide a guard(s) for the cenotaph or memorial.

Special Ceremonial Parades

Special ceremonial parades may be conducted throughout the cadet training year. The following is a list of special ceremonial parades that may be conducted:

- Battle of Britain,
- Battle of the Atlantic,
- Ceremony of the Flags,
- Change of Command,
- Drumhead Ceremony,
- Freedom of the City,

- Military Funeral,
- Retreat and Tattoo,
- Sunset Ceremony, and
- Trooping the Colour(s).

Drill demonstrations may be performed during special ceremonial parades. Standard drill movements must be used at all times.

Refer to A-PD-201-000/PT-000, *The Canadian Forces Manual of Drill and Ceremonial*, for further information on special ceremonial parades.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What is the purpose of parades?

Q2. What two parades are normally conducted on a parade night?

Q3. Identify some of the special ceremonial parades that may be conducted.

ANTICIPATED ANSWERS:

A1. The purpose of parades is to move cadets in an orderly and efficient manner using precise movements required for displays and ceremonies. Parades also showcase the cadets' knowledge of drill to spectators.

A2. Cadet squadrons conduct an opening and closing parades on a parade night.

A3. The following is a list of special ceremonial parades that can be conducted:

- Battle of Britain,
- Battle of the Atlantic,
- Ceremony of the Flags,
- Change of Command,
- Drumhead Ceremony,
- Freedom of the City,
- Military Funeral,
- Retreat and Tattoo,
- Sunset Ceremony, and
- Trooping the Colour(s).

Teaching Point 2 **Describe the parade night sequence.**

Time: 10 min Method: Interactive Lecture

This TP describes the opening and closing parade sequences during a parade night from the view of a team leader commanding a flight on parade.

Distribute to each cadet a copy of the ACR parade sequence located at A-CR-CCP-801/PF-001, *Proficiency Level One Instructional Guides*, Chapter 8, Section 13, Annex A, PO 108 (Participate in an Annual Ceremonial Review [ACR] Parade).

The parade night sequence that is provided in this TP is one way to conduct the parade. Cadet squadron have some flexibility regarding their own routines.

PARADE NIGHT SEQUENCE

It is necessary to know and understand the sequence of the opening and closing parades as a team leader commanding a flight on parade. Team leaders will be required to lead cadets on the parade square through a series of drill commands, formations and movements while effectively communicating.

Opening Parade

The sequence for the opening parade is as follows:

1. **Form up.** Through a series of drill commands, the cadets of the flight will form up for the opening parade.
2. **Roll call.** Attendance is taken by the team leader to determine if cadets are present, excused or absent.
3. **Inspection.** The inspection can be conducted by the team leader, the Cadet Squadron Commander or an officer. In most cases, the team leader conducts the initial inspection of the flight, before the Cadet Squadron Commander or an officer conducts the main squadron inspection.
4. **March past.** This allows the squadron to practice marching for the ACR or any other upcoming parades. As some cadet squadron may not have the required space, a march past may not be possible or is not always required.
5. **Announcements.** This is a good opportunity for any announcements, awards, presentations and / or promotions to be given.

Cadet squadron may present awards or promotions at the opening parade or the closing parade.

6. **Dismissal.** The dismissal signifies the end of the opening parade and the beginning of the training session(s).

Closing Parade

The sequence for the closing parade is as follows:

1. **Form up.** Through a series of drill commands, the cadets of the flight will form up for the closing parade.
2. **Announcements.** This is a good opportunity for any announcements, awards, presentations and / or promotions to be given.

3. **Advance in review order.** This allows the squadron to practice the advance in review order for the ACR and any other upcoming parades. As some cadet squadrons may not have the required space, an advance in review order may not be possible or is not always required.

Final compliments to royalty, senior officials and higher military commanders shall be paid after completing the advance in review order.

4. **Dismissal.** The dismissal signifies the end of the closing parade and the end of the training session.

Refer to PO 108 (Participate in an Annual Ceremonial Review [ACR] Parade) Annex A, for further information.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. How do team leaders lead cadets on parade?

Q2. What is the sequence for the opening parade?

Q3. What is the sequence for the closing parade?

ANTICIPATED ANSWERS:

A1. Team leaders lead cadets on parade through a series of drill commands, formations and movements while effectively communicating.

A2. The sequence for the opening parade is as follows:

- form up;
- roll call;
- inspection;
- march past;
- announcements; and
- dismissal.

A3. The sequence for the closing parade is as follows:

- form up;
- announcements;
- advance in review order; and
- dismissal.

Teaching Point 3 **Describe the ACR sequence.**

Time: 10 min Method: Interactive Lecture

This TP is intended to highlight the ACR sequence from the view of a team leader commanding a flight on parade.

Distribute a copy of the ACR parade sequence located at A-CR-CCP-801/PF-001, *Proficiency Level One Instructional Guides*, Chapter 8, Section 13, Annex D, PO 108 (Participate in an Annual Ceremonial Review [ACR] Parade) to every three cadets. This handout outlines the entire format for an ACR parade sequence.

The ACR format that is provided in this TP is one way to conduct the parade. Cadet squadrons have some flexibility regarding their own routines.

ACR SEQUENCE

The ACR parade provides an opportunity for cadet squadron to showcase what they have learned that year and to demonstrate their grasp of drill for family, friends and the community.

Each year, cadet squadron are required to conduct an ACR parade. The main sections of the parade sequence for the ACR are as follows:

- form up;
- reception of the reviewing officer (RO);
- inspection by the RO;
- march past;
- awards and presentations;
- advance in review order;
- departure of the RO; and
- dismissal.

Upon completion of the march past, squadrons may choose to mount live demonstrations (eg, drill team, music, etc). The reviewing officer's address normally takes place once the squadron has reformed on the parade square. After dismissal, squadrons may invite guests to visit their various static displays.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. How often are cadet squadrons required to conduct an ACR parade?

Q2. What is the purpose of an ACR parade?

Q3. What is the sequence of the ACR parade?

ANTICIPATED ANSWERS:

A1. Each year cadet squadrons are required to conduct an ACR parade.

A2. The ACR parade is an opportunity for cadets to showcase what they have learned that year and to demonstrate their grasp of drill for family, friends and the community.

A3. The parade sequence for the ACR is as follows:

- form up;
- reception of the reviewing officer (RO);
- inspection by the RO;
- march past;
- awards and presentations;
- advance in review order;
- departure of the RO; and
- dismissal.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. What is the purpose of parades?

Q2. What parade do the opening and closing parade sequences follow?

Q3. What is the purpose of an ACR parade?

ANTICIPATED ANSWERS:

A1. The purpose of parades is to move cadets in an orderly and efficient manner using precise movements required for displays and ceremonies. Parades also showcase the cadets' knowledge of drill to spectators.

A2. Opening and closing parades usually follow the ACR sequence, allowing cadets to learn the ACR sequence throughout the training year.

A3. The ACR parade is an opportunity for cadets to showcase what they have learned that year and to demonstrate their grasp of drill for family, friends and the community.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

When placed in a team leader role it is important to remember that cadets will be looking for guidance and knowledge on the parade square. Team leaders will be expected to guide cadets through a parade night and ACR sequence through a series of drill commands, formations and movements.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

A0-002 A-PD-201-000/PT-000 Director History and Heritage 3-2 (2005). *The Canadian Forces manual of drill and ceremonial*. Ottawa, ON: Department of National Defence.

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 3

EO M408.03 – COMMAND A SQUAD

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy and fold in half (laminate if possible) the Parade Sequence Aide-Mémoire Card located at Attachment A for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

A demonstration and performance was chosen for this lesson as it allows the instructor to explain and demonstrate the skill of commanding a squad while providing an opportunity for the cadets to practice the skill under supervision.

INTRODUCTION

REVIEW

The review for this lesson is from EO M408.02 (Identify Parade Sequence).

QUESTIONS:

Q1. What is the sequence for the opening parade?

Q2. What is the sequence for the closing parade?

Q3. What is the general sequence of the Annual Ceremonial Review (ACR) parade?

ANTICIPATED ANSWERS:

A1. The sequence for the opening parade is as follows:

- form up;
- roll call;
- inspection;
- march past;
- announcements; and
- dismissal.

A2. The sequence for the closing parade is as follows:

- form up;
- announcements;
- advance in review order; and
- dismissal.

A3. The general parade sequence for the ACR is as follows:

- form up;
- reception of the reviewing officer (RO);
- inspection by the RO;
- march past;
- awards and presentations;
- advance in review order;
- departure of the RO; and
- dismissal.

OBJECTIVES

By the end of this lesson the cadet shall have commanded a squad.

IMPORTANCE

It is important for cadets to command a squad on parade as they will be placed in a team leader role and will need to know the formations and locations of all members on the parade square. Cadets also need to know how to deliver words of command in a clear and concise manner, with confidence and determination, which will affect how cadets in the squad respond to orders.

Teaching Point 1 **Explain, demonstrate and have the cadets command a squad.**

Time: 25 min Method: Demonstration and Performance

This TP is intended to demonstrate to the cadet how to command a squad. For this skill TP, it is recommended that instruction take the following format:

1. Explain and demonstrate the complete skill of commanding a squad while cadets observe, to include:
   a. falling in;
   b. greeting the RO to complete the inspection;
   c. leading the squad on the march past; and
   d. falling out.
2. Explain and demonstrate each step required to effectively command a squad while on parade.
3. Have each cadet assume the role of team leader and practice each step.
4. Have each cadet assume the role of team leader and practice the complete skill.

Divide the team into two or three groups, if required, for all cadets to command a squad.

This activity shall be conducted IAW A-PD-201-000/PT-000, *The Canadian Forces Manual of Drill and Ceremonial*.

Note: Assistant instructors may be required for demonstration purposes.

Position the cadets around the parade square, as required, so that they can see the movements required to command a squad.

Distribute a copy of the Parade Sequence Aide-Mémoire Card located at Attachment A to each cadet. Cadets may use the card when practicing the skill of commanding a squad.

The term squad is a generic name for a group of cadets, used to teach drill movements. This term can be interchanged with platoon, flight, division or any other applicable elemental or regimental term.

The aim of flight drill is to enable the flight, when it takes its place in the squadron, to carry out any sequence of drill movements that the parade commander orders.

The parade format that is provided in this lesson is one way to conduct the parade. Cadet squadrons have some flexibility, as they may not have the number of cadets required or cadets may have not completed the required training to assume the role of every parade position.

Refer to Annex A of PO 108 (Participate in an Annual Ceremonial Review Parade), for further information on the parade format.

The position of flight sergeant is abbreviated at Flt Sgt.

The rank of Flight Sergeant is abbreviated FSgt.

Falling In

When falling in as a flight sergeant (Flt Sgt), follow the required commands of the squadron warrant officer (Sqn WO) or the deputy parade commander.

If there is no deputy parade commander, the parade commander would complete the required commands and actions.

When assuming the role of a flight commander (Flt Comd), the following additional steps for falling in are to be conducted:

1. The commencement of the promenade begins after the squads have fallen in. The promenade continues until the deputy parade commander or the parade commander is ready to assume command.

2. Flt Comds position themselves five paces in the rear of and centred on the deputy parade commander, at the front of the parade square. Dressing is automatic and Flt Comds are to stand at ease in succession from the right.

3. On the command OFFICERS FALL—IN, by the deputy parade commander, Flt Comds come to attention, turn left and march to their respective squads, approaching their squads from the right flank front (as illustrated in Figure 1).

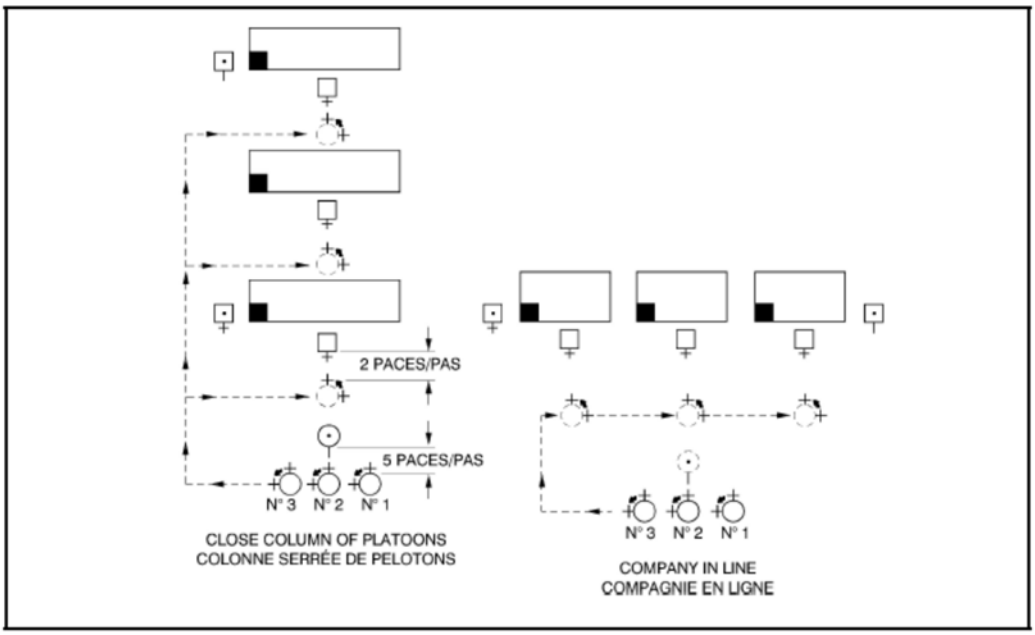

Figure 1 When Officers Fall In

Note. From *The Canadian Forces Manual of Drill and Ceremonial* (p. 7-3-16), by Director History and Heritage 3-2, 2005, Ottawa, ON: Department of National Defence.

4. Flt Comds halt two paces in front of the Flt Sgt, who reports the strength, condition, etc, of the squad. Flt Comds then march forward two paces to take their proper command position after the Flt Sgt has moved to their position behind the squad.

Figure 1 demonstrates the fall-in procedures when a Flt Comd and a Flt Sgt are on parade. Inform the cadets that if no Flt Comd is required to fall in, the Flt Sgt will maintain command of the flight.

Regardless of frontage, when a squad is formed up in line the Flt Comd / Flt Sgt shall be positioned three paces in front and centre of the squad.

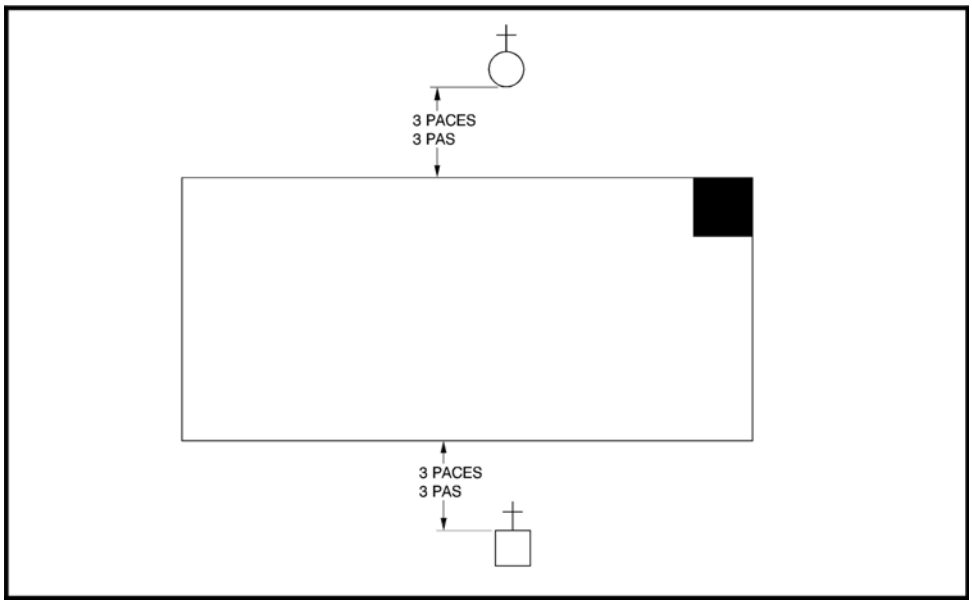

Figure 2 Squad in Line

Note. From *The Canadian Forces Manual of Drill and Ceremonial* (p. 7-2-2), by Director History and Heritage 3-2, 2005, Ottawa, ON: Department of National Defence.

Figure 2 demonstrates the command positions when a Flt Comd and a Flt Sgt are on parade.

When on parade, each squad follows the same procedures to hand over command. Once the Flt Comd / Flt Sgt are in their new position(s), the command STAND AT—EASE, is given in succession from the front (right). On the executive word of command of the last Flt Comd / Flt Sgt ordering their squad to stand at ease, Flt Comd / Flt Sgts turn about and stand at ease together.

Throughout the parade it is important to remember that words of command are to be pronounced clearly and distinctly, with confidence and determination, since they convey an order which is to be promptly obeyed.

Refer to A-CR-CCP-803/PF-001, *Proficiency Level Three Instructional Guides*, EO M308.02 (Deliver Words of Command), if further information is required on how to deliver proper words of command.

When paying compliments during the parade, all salutes must be acknowledged and conducted in a sharp manner.

Greeting the RO to Complete the Inspection

Inspections are conducted one squad at a time, normally accompanied by the RO and the reviewing party. The parade commander will give the command NO. 1 SQUAD, STAND FAST, REMAINDER STAND AT—EASE before the inspection begins. The inspection commences with the squad ordered to stand fast.

As the RO approaches, the Flt Comd / Flt Sgt turns right and marches to a position three paces in front of the marker, facing the RO. When the RO approaches, the Flt Comd / Flt Sgt will salute (if required) and report the squad.

The following is an example opening report from the Flt Comd / Flt Sgt to the RO, when the RO approaches the squad for the inspection.

"Good evening (morning / afternoon) sir (ma'am), Sergeant Jones reporting for number one squad, 25 cadets on parade, ready for your inspection".

If the RO is a local government official, a civilian or a non-commissioned officer (NCO), a salute is not required.

The Flt Comd / Flt Sgt will guide the RO through the front and rear of each rank, commencing at the right flank of the front rank and proceeding in a counter-clockwise direction around each rank in turn. When the RO has completed the inspection, the Flt Comd / Flt Sgt will position themselves behind the rear rank marker, to acknowledge the RO's completion of the squad's inspection, ask permission to carry on and salute (if required).

The following is an example response from Flt Comd / Flt Sgt to the RO, when the RO has completed the inspection of the squad.

"Sir (ma'am), thank you for inspecting number one squad. Permission to carry on?"

Once the RO has begun to move to the next squad, the Flt Comd / Flt Sgt executes a right turn and marches, using a series of wheels, back to their command position facing the squad. When in position the Flt Comd / Flt Sgt shall give the commands CLOSE ORDER—MARCH and STAND AT—EASE. The Flt Comd / Flt Sgt will then turn about to face the front, stand at ease, and await further orders from the parade commander.

As the inspection is being completed, the remaining Flt Comds / Flt Sgts will observe the RO and as the RO inspects the rear rank of the preceding squad, the next Flt Comd / Flt Sgt shall turn about to face their squad, give the command ATTEN—TION and carry out the inspection sequence for their squad.

Inspections are always carried out at the open order.

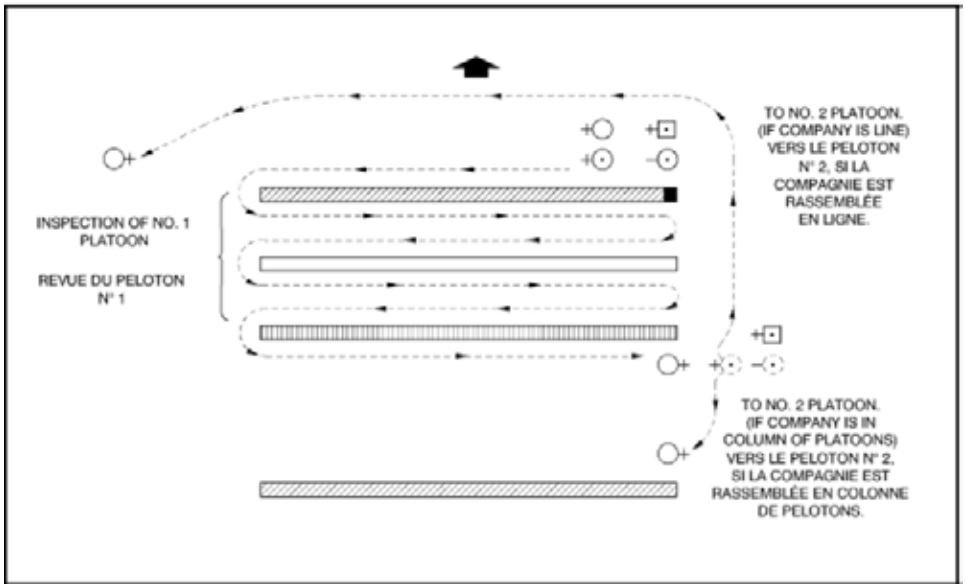

Figure 3 Completing the Inspection

Note. From *The Canadian Forces Manual of Drill and Ceremonial* (p. 7-3-18), by Director History and Heritage 3-2, 2005, Ottawa, ON: Department of National Defence.

Leading the Squad on the March Past

March pasts may be conducted in column of route or in column of threes, depending on time and space available, level of training and the occasion. The simplest march past is column of route in quick time.

Throughout the march past, when commanded by the parade commander, the Flt Comd / Flt Sgt may be required to give the command EYES—RIGHT and EYES—FRONT to their respective squad.

The commands EYES—RIGHT and EYES—FRONT, will be given on the left foot.

If there are turns on the march past, the Flt Comd / Flt Sgt may be required to give the commands RIGHT—TURN (called on the left foot) and / or LEFT—TURN (called on the right foot), when directed by the parade commander.

At the end of the march past, the command HALT (called on the left foot) may also be required to be given, when directed by the parade commander.

Column of route. The Flt Comd / Flt Sgt is two paces in front of the centre single file of the squad. Column of route is the formation most commonly used to move squads on the march.

When halted in this position and given the command to turn, the Flt Comd / Flt Sgt will turn in the appropriate direction, observe the standard pause and march, using a series of wheels, to their appropriate position(s).

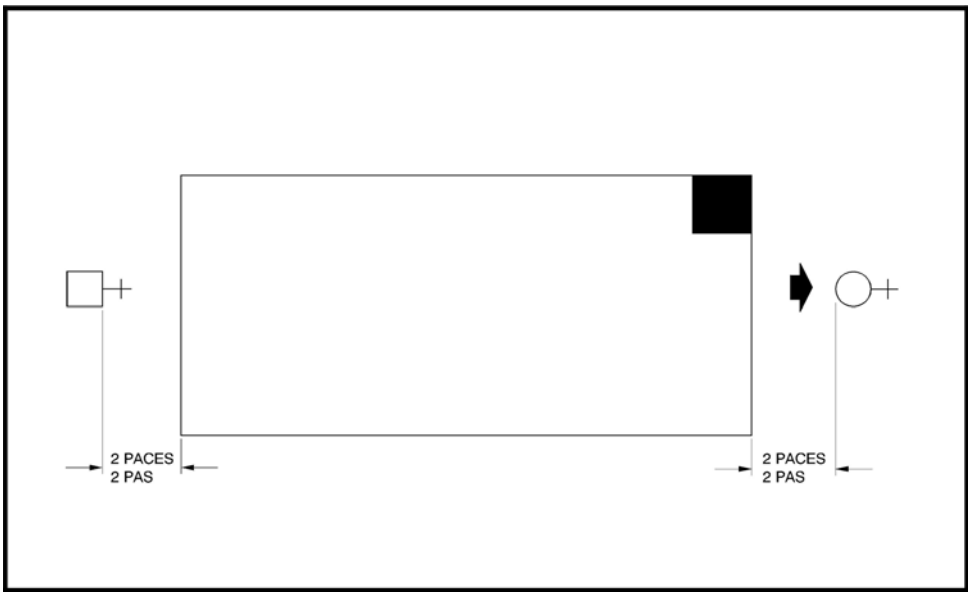

Figure 4 Squad in Column of Route

Note. From *The Canadian Forces Manual of Drill and Ceremonial* (p. 7-2-4), by Director History and Heritage 3-2, 2005, Ottawa, ON: Department of National Defence.

Figures 4 and 5 demonstrate the command positions when a Flt Comd and a Flt Sgt are on parade for the march past, in column of route. If there is no Flt Comd, the Flt Sgt will command the flight.

Column of threes. A squad in column of threes is in the same formation as when in line, but facing a flank. Column of threes is another formation used to move a squad on the march.

When halted in this position and given the command to turn, the Flt Comd / Flt Sgt turn in the appropriate direction and maintain their position(s).

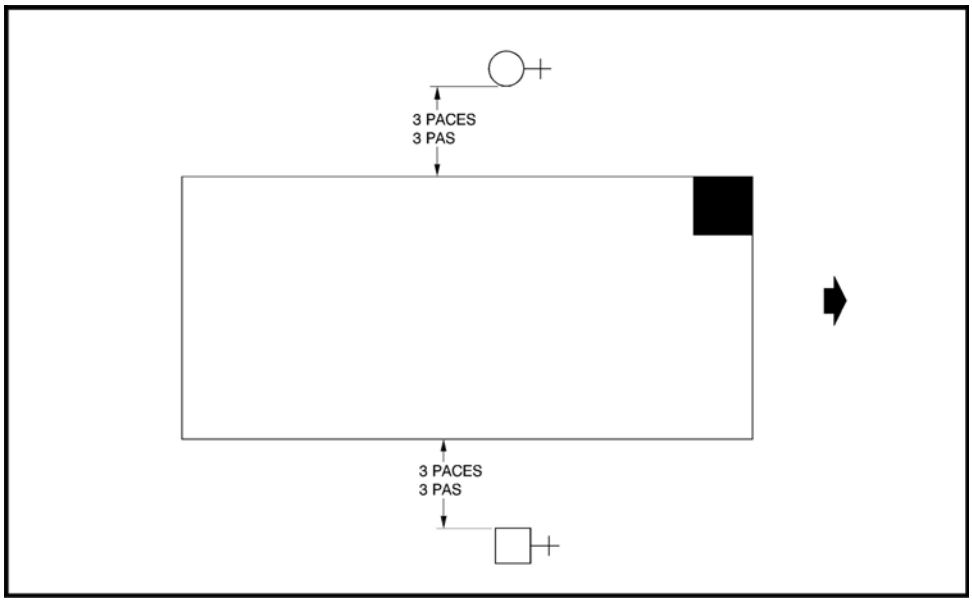

Figure 5 Squad in Column of Threes

Note. From *The Canadian Forces Manual of Drill and Ceremonial* (p. 7-2-3), by Director History and Heritage 3-2, 2005, Ottawa, ON: Department of National Defence.

Falling Out

When falling out as a Flt Sgt, follow the commands of the Sqn WO or the deputy parade commander.

When assuming the role of a Flt Comd, the following additional steps of falling out are to be conducted:

1. On the command OFFICERS, FALL—OUT, which is given by the parade commander when the parade is at attention, the Flt Comd marches the most direct route and forms up in a line, five paces in front of, centred on and facing, the parade commander, at arm's length interval (without raising the arm), the deputy parade commander on the right.
2. When all Flt Comds are present and in line, the deputy parade commander takes a half pace forward.
3. When ordered by the parade commander to DIS—MISS, the deputy parade commander will step back one half pace. All Flt Comds will observe the standard pause and march straight forward off the parade square, along with the deputy parade commander.

CONFIRMATION OF TEACHING POINT 1

The cadets' commanding a squad will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' commanding a squad will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This lesson is assessed IAW A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, 408 PC.

CLOSING STATEMENT

Commanding a squad on parade with confidence and determination, will affect how cadets respond to the orders given. Delivering words of command, in a clear and concise manner allows a squad to move as a team in an organized and efficient manner.

INSTRUCTOR NOTES / REMARKS

Where there are a large number of cadets, divide the group into two or three squads and rotate the cadets through as commanders.

REFERENCES

A0-002 A-PD-201-000/PT-000 Director History and Heritage 3-2. (2005). *The Canadian Forces manual of drill and ceremonial*. Ottawa, ON: Department of National Defence.

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PARADE SEQUENCE AIDE-MÉMOIRE CARD

✂

PARADE SEQUENCE AIDE-MÉMOIRE CARD

FALLING IN

When falling in as a Flt Sgt:
Follow the required commands of the Sqn WO or the deputy parade commander.

When falling in as a Flt Comd:

1. Stand at ease in succession from the right, once in position.
2. On the command to fall in, come to attention, turn left and march to the flight, approaching from the right flank.
3. Halt two paces in front of Flt Sgt.
4. March two paces forward (assume the proper command position) and give the command **STAND AT—EASE**.
5. On the executive word of command of the last flight ordered to stand at ease, turn about and stand at ease.

GREETING THE RO TO COMPLETE THE INSPECTION

1. Ensure the flight is at attention. Give the command **ATTEN—TION** (if required).
2. Turn right and move to a position three paces in front of the marker (check RO's position as required).
3. Salute the RO (if required) and report the flight (eg, "Good evening [morning / afternoon] sir [ma'am], Sergeant Jones reporting for number one flight, 25 cadets on parade, ready for your inspection").
4. Guide the RO through the ranks.
5. After the inspection, stand to attention behind the rear rank marker and salute (if required) and respond to the RO (eg, "Sir [ma'am], thank you for inspecting number one flight. Permission to carry on?").
6. Execute a turn and march back to the front of the flight.
7. Give commands **CLOSE ORDER—MARCH** and **STAND AT—EASE** to the flight.
8. Turn about to face front, stand at ease and await further orders from the parade commander.

LEADING THE FLIGHT ON THE MARCH PAST

- Execute all commands given by the parade commander, as per the parade sequence.
- Assume the correct command positions throughout the march past.
- Give the commands **LEFT—TURN** (as required), **EYES—RIGHT**, **EYES—FRONT**, **RIGHT—TURN** (as required) and **HALT** (as required), as directed by the parade commander.

FALLING OUT

When falling out as a Flt Sgt:
Follow the required commands of the Sqn WO or the deputy parade commander.

When falling out as a Flt Comd:

- On the command to fall out, march the most direct route and form up in position facing the parade commander.
- On the command to dismiss, observe the standard pause and march straight off parade square.

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 4

EO M408.04 – INSPECT A CADET ON PARADE

Total Time: 60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy CATO 55-04, *Air Cadet Dress Instructions* and the Dress Instructions Activity Worksheet located at Attachment A, for every three cadets.

Photocopy the Dress Instructions Checklist located at Attachment C for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An in-class activity was chosen for TP 1 as it is an interactive way to provoke thought and stimulate interest and confirm comprehension of elemental dress instructions.

A demonstration and performance was chosen for TP 2 as it allows the instructor to explain and demonstrate the skill of inspecting a cadet on parade while providing an opportunity for the cadets to practice the skill under supervision.

INTRODUCTION

REVIEW

The review for this lesson is from EO M408.03 (Command a Squad).

QUESTIONS:

Q1. Regardless of frontage, when a squad is formed up in line, how many paces must the flight commander / flight sergeant be positioned when in front and centre of the squad?

Q2. What is an example report when the reviewing officer (RO) approaches the squad for the inspection?

Q3. When commanding the squad as a team leader, what is the team leader responsible for?

ANTICIPATED ANSWERS:

A1. When a squad is formed up in line the flight commander / flight sergeant shall be positioned three paces in front and centre of the squad.

A2. "Good evening (morning / afternoon) sir (ma'am), Sergeant Jones reporting for number one squad, 25 cadets on parade, ready for your inspection".

A3. When commanding a squad, the team leader is responsible for:

- falling in;
- greeting the RO to complete the inspection;
- leading the squad on the march past; and
- falling out.

OBJECTIVES

By the end of this lesson the cadet shall be expected to inspect a cadet on parade.

IMPORTANCE

It is important for cadets to be able to inspect a cadet on parade as they will be placed in a team leader role and will need to know how to effectively correct errors and evaluate dress, IAW CATO 55-04, *Air Cadet Dress Instructions*. Team leaders must maintain a high standard of appearance and bearing, as cadets will be looking to their team leader for examples, guidance and knowledge when it comes to wearing the elemental cadet uniform.

Teaching Point 1 **Conduct an activity where the cadets will, in groups of three, identify the correct way of wearing the cadet uniform.**

Time: 15 min Method: In-Class Activity

Refer to CATO 55-04, *Air Cadet Dress Regulations* for background information. CATOs can be found online at www.cadets.gc.ca.

ACTIVITY

OBJECTIVE

The objective of this activity is to have the cadets, in groups of three, identify the correct way of wearing the cadet uniform.

RESOURCES

- Dress Instructions Activity Worksheet located at Attachment A (one per group),
- CATO 55-04, *Air Cadet Dress Instructions* (one per group),
- Dress Instructions Activity Worksheet Answer Sheet located at Attachment B,
- Tables (one per group),
- Chairs (one per cadet), and
- Pen / pencil (one per group).

ACTIVITY LAYOUT

Set up the drill hall or outdoor parade square with tables and chairs for group work, with the required resources for each group to complete their activity worksheet.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into groups of three.
2. Distribute the Dress Instructions Activity Worksheet to each group.
3. Allow each group five minutes to answer the questions on their worksheet.
4. Circulate and assist the cadets as necessary, offering suggestions and advice. Refer to the Dress Instructions Activity Worksheet Answer Sheet, as required.
5. Distribute a copy of CATO 55-04, *Air Cadet Dress Instructions* to each group.
6. Have the cadets, within the group, discuss and confirm their answers from their group activity worksheet.
7. Allow the groups five minutes to check their answers on their worksheet.
8. Review the answers with the class.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the activity will serve as the confirmation of this TP.

Teaching Point 2 **Explain, demonstrate and have the cadets perform an individual inspection.**

Time: 35 min Method: Demonstration and Performance

This TP is intended to demonstrate how to perform an individual inspection and to aid the cadets' comprehension of the inspection process as a team leader. For this skill TP, it is recommended that instruction take the following format:

1. Explain and demonstrate the complete skill of performing an individual inspection while cadets observe, to include:
   a. inspecting the front of the cadet from head to toe;
   b. inspecting the back of the cadet from head to toe; and
   c. correcting errors verbally, as required.
2. Explain and demonstrate each step required to effectively perform an individual inspection.
3. Have each cadet assume the role of team leader and practice each step.
4. Have each cadet assume the role of team leader and practice the complete skill.

Divide the team into two equal groups, if required, for all cadets to assume the role of a team leader inspecting a squad.

Note: Assistant instructors may be employed for demonstration purposes.

This activity will be conducted IAW A-PD-201-000/PT-000, *The Canadian Forces Manual of Drill and Ceremonial*.

Distribute a copy of the Dress Instruction Checklist located at Attachment C to each cadet, as a reference when assuming the role of team leader inspecting a squad.

In this TP, the role of flight commander is referred to as the team leader.

Inspections shall be carried out at the open order. Ranks shall be dressed after the open order, before the inspection and after the close order. The individual performing the inspection will inspect the front and rear of the rank, commencing at the front rank marker and proceeding in a counter-clockwise direction around each rank in turn.

Ranks that are being inspected are in the position of attention and ranks within the same flight that are not being inspected, may be ordered to stand at ease. Similarly, during the inspection of one or more squads, the squads that are not being inspected may be ordered to stand at ease. During an inspection, an individual ordered to adjust clothing or equipment shall do so immediately, maintaining their current position within the ranks. After the adjustment is finished, the position of attention will be resumed.

INSPECTING THE FRONT OF A CADET FROM HEAD TO TOE

Inspecting the front of the cadet shall commence at the head and work down to the feet to determine that the cadet:

- is properly equipped for the parade, with clothing and equipment clean and in good repair;
- is properly dressed, with all clothing, badges, ribbons, etc, worn correctly; and
- has a high standard of personal hygiene and grooming.

INSPECTING THE BACK OF A CADET FROM HEAD TO TOE

Inspecting the back of the cadet is done in the same manner as inspecting the front; commence at the head and work down to the feet. The individual performing the inspection is also checking that the cadet is properly dressed and equipped with a high standard of personal hygiene.

CORRECTING ERRORS VERBALLY

Speak to cadets clearly and positively to ensure maximum learning and understanding of the dress instructions.

When correcting errors, the team leader(s) is to address the cadet in a positive tone. Explain and demonstrate the correct method and have the cadet complete the correction (providing it is a minor correction / adjustment that can be done while the cadet is in ranks). This method will allow the cadet to learn from their error(s).

When correcting errors, never touch the cadet. Either ask permission to touch the cadet's uniform or demonstrate how to correct the error using one's own uniform.

CONFIRMATION OF TEACHING POINT 2

The cadets' performance of an individual inspection will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' performance of an individual inspection will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

When placed in a team leader role, it is important to remember that cadets will be looking for examples, guidance and knowledge regarding the elemental cadet dress instructions. Team leaders who portray a high standard of appearance and bearing are able to effectively evaluate dress and correct errors in a positive manner.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

A0-002 A-PD-201-000/PT-000 Director History and Heritage 3-2. (2005). *The Canadian Forces manual of drill and ceremonial*. Ottawa, ON: Department of National Defence.

A3-006 CATO 55-04 Director Cadets 3. (2005). *Air cadet dress instructions*. Ottawa, ON: Department of National Defence.

DRESS INSTRUCTIONS ACTIVITY WORKSHEET

Instructions: Circle TRUE or FALSE for each question. After all questions have been answered, read through CATO 55-04, *Air Cadet Dress Instructions*, to confirm the answers.

1.	**There are three occasions when cadets are permitted to wear their uniforms.** TRUE or FALSE
2.	**Cadet medals are worn on the right side of the dress uniform jacket.** TRUE or FALSE
3.	**Cadets are not authorized to wear makeup while in uniform.** TRUE or FALSE
4.	**For ceremonial purposes, buttons other than plastic blue buttons distributed with the uniform jacket may be authorized for wear by the CO RCSU.** TRUE or FALSE
5.	**The double overhand knot is to be used to tie the necktie.** TRUE or FALSE
6.	**The Supply Officer is to ensure that the cadets are dressed in accordance with the CATOs.** TRUE or FALSE
7.	**The wedge shall be worn evenly when positioned on the head.** TRUE or FALSE
8.	**Air Cadets are authorized to wear wedge insignia other than the metal or woven wedge insignia.** TRUE or FALSE
9.	**The Remembrance Day poppy is to be placed / pinned and centred on the top left pocket flap of the cadet dress jacket.** TRUE or FALSE
10.	**Civilian backpacks must never be carried or worn while in uniform.** TRUE or FALSE
11.	**Metal wings or silver and gold braided thread wings may be worn.** TRUE or FALSE
12.	**The name tag is exactly 7 cm in length.** TRUE or FALSE
13.	**The wearing of squadron anniversary pins on the air cadet uniform is forbidden.** TRUE or FALSE

14.	**The belt on the dress uniform jacket shall be adjusted so that the excess of the belt is no more than 6 cm.** TRUE or FALSE
15.	**The length of the trousers should extend to the 3rd eyelet of the parade boot.** TRUE or FALSE

DRESS INSTRUCTIONS ACTIVITY WORKSHEET ANSWER SHEET

1. There are three occasions when cadets are permitted to wear their uniforms.

ANSWER: TRUE

PARAGRAPH NUMBER: 26 (a), (b) and (c)

FURTHER INFORMATION: Cadets shall wear their uniform when:

a. attending training or proceeding to or from a place of training unless directed by the squadron CO;

b. proceeding to or from a CSTC; and

c. attending ceremonies or functions at which the wearing of uniform is appropriate and authorized by the cadets squadron or CSTC CO.

2. Cadet medals are worn on the right side of the dress uniform jacket.

ANSWER: TRUE

PARAGRAPH NUMBER: TBD

FURTHER INFORMATION: Medals shall be suspended above the right breast pocket of the jacket, immediately above and centred. When two or more medals are awarded, they shall be worn in order of precedence, without interval, with the highest priority medal closest to the centre of the chest. Medals shall hang in one row so that they are fully visible. Should this not be possible because of the number being worn, medals shall be overlapped horizontally, the one with the highest priority showing in full. Normally, five or more medals will require overlapping. The maximum width of the mounting is governed by the physique of the individual. The bar shall not project beyond the arm seam of the jacket once the mounting is centred with the jacket pocket.

3. Cadets are not authorized to wear makeup while in uniform.

ANSWER: FALSE

PARAGRAPH NUMBER: 35

FURTHER INFORMATION: Female cadets are authorized to wear a minimal amount of make-up. When in uniform, make-up shall be applied conservatively. This precludes the use of false eyelashes, heavy eyeliner, brightly coloured eye shadow or lipstick, coloured nail polish, and excessive facial make-up.

4. For ceremonial purposes, buttons other than plastic blue buttons distributed with the uniform jacket may be authorized for wear by the CO RCSU.

ANSWER: FALSE

PARAGRAPH NUMBER: 28 (l)

FURTHER INFORMATION: Only those plastic blue buttons distributed with the uniform jacket may be worn.

5. The double overhand knot is to be used to tie the necktie.

ANSWER: FALSE

PARAGRAPH NUMBER: 28 (h)

FURTHER INFORMATION: The necktie shall be knotted neatly using a Windsor or four-in-hand knot and shall be kept tight.

6. The Supply Officer is to ensure that the cadets are dressed in accordance with the CATOs.

ANSWER: FALSE

PARAGRAPH NUMBER: 2

FURTHER INFORMATION: Squadron COs shall ensure that cadets under their command are dressed in accordance with CATO 55-04.

7. The wedge shall be worn evenly when positioned on the head.

ANSWER: FALSE

PARAGRAPH NUMBER: 28 (b)

FURTHER INFORMATION: The wedge shall be worn on the right side of the head, lower point of the front crease in the centre of the forehead and with the front edge of the cap 2.5-cm above the right eyebrow.

8. Air Cadets are authorized to wear wedge insignia other than the metal or woven wedge insignia.

ANSWER: FALSE

PARAGRAPH NUMBER: 28 (c)

FURTHER INFORMATION: Air Cadets are not authorized to wear other insignia.

9. The Remembrance Day poppy is to be placed / pinned and centred on the top left pocket flap of the cadet dress jacket.

ANSWER: TRUE

PARAGRAPH NUMBER: 51

FURTHER INFORMATION: The Remembrance Day poppy is authorized to be worn on all numbered orders of dress of the cadet uniform from the last Friday of October until Remembrance Day (11 November). On the cadet jacket the poppy shall be pinned and centred on the top left pocket flap, or in a similar position on the all-season jacket. When medals are worn, the poppy shall be worn centred just above the medals or if worn, over the pilot wings.

10. Civilian backpacks must never be carried or worn while in uniform.

ANSWER: FALSE

PARAGRAPH NUMBER: 16 (n)

FURTHER INFORMATION: Civilian pattern backpack, of conservative appearance, may either be carried in the left hand or worn suspended from both shoulders and square on the back. No item will be suspended from the backpack and straps shall not be left loose.

11. Metal wings or silver and gold braided thread wings may be worn.

ANSWER: TRUE

PARAGRAPH NUMBER: 16 (a) and (b)

FURTHER INFORMATION: Metal wings may be obtained from the Air Cadet League (ACL). They may be worn on the short-sleeve shirt only with all orders of dress, except for cadets on courses at CSTCs. Silver and gold braided thread wings may be obtained from the ACL. They are worn only on the jacket in lieu of wings presented upon completion of the Power Pilot or Glider Pilot Scholarship.

12. The name tag is exactly 7 cm in length.

ANSWER: FALSE

PARAGRAPH NUMBER: 16 (c)

FURTHER INFORMATION: The name tag shall be detachable, made of blue and white laminated plastic plate, 6.3 cm in length and 1.2 cm in height, inscribed with white lettering 0.6 cm high.

13. The wearing of squadron anniversary pins on the air cadet uniform is forbidden.

ANSWER: FALSE

PARAGRAPH NUMBER: 52

FURTHER INFORMATION: Regional Cadet Support Unit (RCSU) CO may authorize the wear of pins that are produced locally, and at no cost to the public, to commemorate the anniversary of a sqn, CSTC or RGS.

14. The belt on the dress uniform jacket shall be adjusted so that the excess of the belt is no more than 6 cm.

ANSWER: FALSE

PARAGRAPH NUMBER: 28 (m)

FURTHER INFORMATION: The jacket belt shall be worn so as the excess of the belt, once attached, is on the left side of the buckle. The buckle shall be adjusted so that the excess of

the belt on the left side is not more than 8 cm.

15. The length of the trousers should extend to the 3rd eyelet of the parade boot.

ANSWER: TRUE

PARAGRAPH NUMBER: 29 (n)

FURTHER INFORMATION: The length of the trousers should extend to the 3rd eyelet of the boot.

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DRESS INSTRUCTIONS CHECKLIST

CADET'S NAME _____ FLIGHT _____

Uniform Items / Accessories	Check (√) if Item is Clean / Pressed / Polished	Additional Comments
HEADDRESS		
Wedge / Turban and Insignia		
CLOTHES ON THE UPPER BODY		
Badges (proper placement and sewn on correctly)		
Cadet Slip-on or Armlet		
Shirt, Cadet, Short Sleeve		
Turtleneck Sweater		
Uniform Jacket and Belt		
Necktie		
Name Tag		
CLOTHES ON THE LOWER BODY		
Trousers and Belt		
FOOTWEAR		
Parade Boots (with grey wool socks)		
OVERALL PERSONAL APPEARANCE		
Hair (includes facial hair)		
Makeup, Jewellery, Sunglasses, etc		
PHYSICAL FITNESS GEAR (as required)		
Grey Sports T-Shirt and Shorts		
Running Shoes		

Note. Additional comments may be recorded on the back of the checklist.

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 5

EO C408.01 – DISCUSS THE HISTORY OF DRILL

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy the Summary of Significant Drill Events handout located at Attachment A for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to orient the cadets to the history of drill and generate interest in the subject.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have discussed the history of drill.

IMPORTANCE

It is important for cadets to discuss the history of drill as it represents a part of military history. Being able to understand the purpose and evolution of drill will help cadets understand why drill movements are performed by the military today.

Teaching Point 1 **Discuss the origins of drill.**

Time: 10 min Method: Interactive Lecture

This TP is intended to introduce the origin of drill throughout ancient history and how vital drill used was on the battlefield.

Distribute the Summary of Significant Drill Events located at Attachment A to each cadet.

In ancient history, the most powerful, efficient and developed empires developed ways of moving soldiers from one place to another on the battlefield, without individuals getting confused and mixed up with other units. Empires realized that well-drilled soldiers were more efficient in battle.

The earliest known drill movement, during the rise of kingship in Mesopotamia, about 3000 BC, was close-order drill, defined as shoulder to shoulder marching.

At one time, drill and tactics were the same, as drill was needed on the battlefield. Battle drill has existed since ancient times. Separate drill for infantry, armoured, cavalry and others were replaced by all arms drill early in the 20th century, as the changing conditions of war gradually separated tactics from barrack routine.

Infantry. Infantry drill was practiced regularly around 1000 BC and was necessary to ensure that each soldier's movements matched those of the rest.

Armoured. Soldiers, known as armoured spearmen, fought in close-order drill and marched in step to maintain an unbroken shield wall against the enemy. Regular practice was needed to keep the ranks together during battle.

Cavalry. In 875 BC, about a century after the infantry and armoured were developed, a new battlefield tactic (the bow and arrow) was introduced and a new style of warfare drill developed, which resulted in the establishment of the Cavalry. The Cavalry could attack from a distance, with the use of horses. They learned to do drill on the horses, control the horses and aim and shoot their bow and arrow.

Imitation of battle taught the proper use of weapons and strengthened endurance on the battlefield. Armies found that by teaching the soldiers drill and battle procedures, their chances of victory significantly improved.

Drill is still used routinely to move soldiers in an orderly and efficient manner. It also forms the basis of the precise manoeuvres used in military displays and ceremonies.

Romans

Around 2400 BC, Romans realized the way to learn the required skills when deploying for battle was by training Roman soldiers to execute drill in formation. At the beginning of training, recruits were taught the military pace by marching quickly, in time and in formation, up to 32 km (20 miles) a day. Three times a month, garrison soldiers marched 16.1 km (10 miles), built a fortified camp and returned to base, all in the same day. Individual skills with weapons were also developed with daily practice.

Romans spent most of their time practicing ceremonial guard duty and drill, in order to become well-drilled soldiers. The emotional significance of daily and prolonged close-order drill created a lively esprit de corps among the poverty-stricken peasant recruits and the urban outcasts.

The Romans are presumed to have used cadence while marching for tactical formations. Romans regarded military music quite seriously, as they had several warlike instruments. Each soldier had a trumpet, a horn, or both. These were employed for signals, or what is now referred to as “calls”. Instruments were used for marching music and to direct the movement of soldiers.

As Roman soldiers clashed with other armies, they would learn and employ the same sort of successful drill that the other armies had developed.

Greeks and Spartans

Greek citizens did not willingly accept the rigors of military drill, but the emotional effects of keeping together did not disappear when citizen soldiers ceased to dominate military affairs. Drill became more elaborate in the fourth century BC, as those who participated in drill were professional soldiers whose loyalties were to their commanders.

Spartans engaged in drill and marching exercises on a regular basis and learned how to advance evenly into battle by keeping in step to the sound of music, all without breaking their order or ranks. Spartans also learned how to execute flanking movements and open and close order march, allowing their armies to alter the length of their front.

A Spartan is a citizen of Sparta (city in the South Peloponnese) in ancient Greece.

Spartans developed rigorous styles of military training as they required youth to live apart from family, according to their age class in order to participate in physical exercises and military drill.

Chinese

Chinese armies used drummers to beat the drums while soldiers were marching. The drummers would beat the drums once to signify the left foot moving forward and then beat it again to signify the right foot moving forward.

When drill and combat methods were taught, they were taught to 100 men at a time. After instruction to 100 men was complete, they were united with other companies which were comprised of 1 000 men. When the instruction to the 1 000 men was complete, they were combined with other regiments.

Large infantry armies were taught to handle their weapons in unison and maintain formation by keeping in step on the battlefield, all by responding to signals. Most of China's drill movements between 400 and 300 BC were derived from the Romans and the Greeks.

If a drummer missed a beat, he was executed. Those that moved by themselves or did not obey the drums or signals were also executed.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. In ancient history, why did empires develop ways of moving organized soldiers from one place to another?

Q2. At the beginning of training, how were Roman recruits taught military pace?

Q3. Why did Chinese armies use drums?

ANTICIPATED ANSWERS:

A1. In ancient history, the most powerful, efficient and developed empires developed ways of moving soldiers from one place to another on the battlefield, without individuals getting confused and mixed up with other units.

A2. At the beginning of training, Roman recruits were taught military pace by marching quickly, in time and in formation, up to 32 km (20 miles) a day.

A3. Chinese armies used drummers to beat the drums when soldiers were marching. The drummers would beat the drum once to signify the left foot moving forward and then beat it again to signify the right foot moving forward.

Teaching Point 2 **Discuss the evolution of drill movements.**

Time: 15 min Method: Interactive Lecture

This TP is intended to describe the evolution of drill and how drill movements and instruction developed throughout the years.

Infantry supremacy and precise drills were eclipsed after the fall of the Roman Empire. During the feudal era, mounted knights ruled combat. Infantry drills were resurrected in the 14th century and slowly developed and improved thereafter.

Swiss

Disciplined soldiers marched in cadence to the sound of musical instruments in admirable order beneath their banners. It is believed that the Swiss, in the late 1300s, were the first modern soldiers to march to music.

Dutch

Words of command were starting to be used for drill shortly after it was introduced to the Dutch in the late 1500s. It became possible to get soldiers to move in unison while performing the actions needed to load, aim and fire their weapons. The soldiers practiced until the necessary motions were almost automatic. This made them less likely to be disrupted by the stress of battle, an advantage when meeting untrained soldiers.

Words of command permitted companies, platoons and squads to respond to their designated leader as different movements and commands were established for units of every size. Soldiers had to practice these movements whenever possible. It was determined that when an entire army was trained this way, control of battle became possible.

In the early 1600s, an artist was used to make engravings of each posture required for each drill movement, with the corresponding words of command below each picture. This material was then gathered and published into a book.

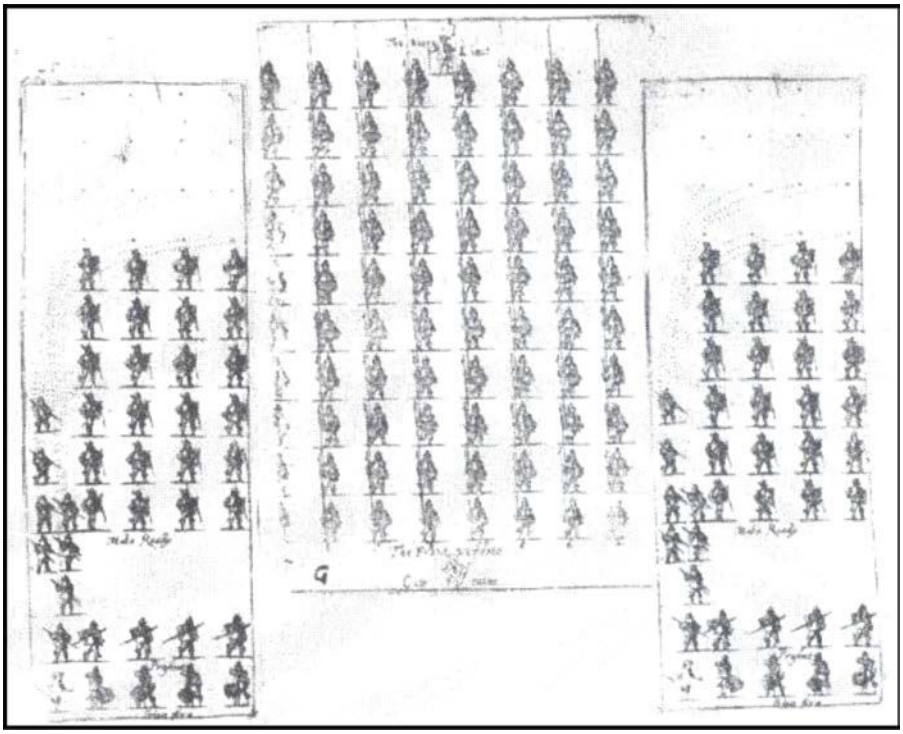

Figure 1 Diagram of a Drill Movement in the 1600s

Note. From *Keeping Together in Time: Dance and Drill in Human History* (p. 86), W. H. McNeill, 1997, Cambridge, MA: Harvard University Press. Copyright 1995 by William H. McNeill.

Over the next half century, the Germans, Russians, Spaniards and French translated the book, causing these drill movements to spread across Europe.

Germans

In the mid 1800s, the Germans (and the Swiss) had the idea of having soldiers become instructors. This provided the opportunity to break down the drill movement(s), demonstrating for all soldiers to see and by allowing the leaders to call out the movements, "by the numbers".

In the late 1800s, the British, Japanese and Chinese followed the Germans and the Swiss by having soldiers teach drill movements.

British

In the British Army, the balance step was a feature of the ordinary march step, experienced today as the slow march. The balance step was introduced as soldiers were required to manoeuvre shoulder to shoulder over rough and uneven ground in disciplined ranks, while giving effective volley fire. Each recruit was trained as a member of a squad until perfect in all points of duty. Each soldier was allowed to join the battalion after being fully trained. Every soldier, after returning from a long absence, had to be re-drilled before being permitted to act in the ranks of his company.

It was imperative that commanders were able to estimate the time required for soldiers to march from point A to point B on foot. With that in mind, the following marches were introduced to the British Army in 1824:

- **March (75 steps per minute, each step 30 inches [76 cm]).** The slowest step (otherwise known as slow time) at which soldiers moved. This march was most commonly used for parades or moving very large formations.
- **Quick march (108 steps per minute, each step 30 inches [76 cm]).** This ordinary pace was applied to most movements by large bodies of soldiers.
- **Wheeling step (120 steps per minute, each step 30 inches [76 cm]).** Wheeling (forming) from line into column or vice versa, ensured there was no delay in achieving the required formation to face a new enemy.
- **Double march (150 steps per minute, each step 36 inches [91 cm]).** This march was applied to the movements within the divisions within a battalion without exhausting soldiers in heavy marching order (eg, load carrying equipment). In rank movements, the double march, when safely applied, may be used in rapid formations, or for quickly moving ranks.

Canadian

- **Royal Canadian Navy.** The Royal Canadian Navy used army drill and ceremonial procedures when on solid ground, by parading as platoons, companies and battalions. While on a ship, the navy conducted ship board drill. The navy still uses the same drill movements while on solid ground; however, they parade by divisions.
- **Canadian Army.** With few exceptions, Canada's Armed Forces used British drill manuals (sometimes with just a Canadian cover and covering page) up until the end of World War II (WW II). It was only with the introduction of a new family of small arms weapons (1989 Draft Drill Manual), and similar developments in other Commonwealth countries, that some of the old drill movements diverged. There were still many similarities in drill, allowing Canadian regiments to execute drill alongside British Army personnel.

  One strong influence on the Canadian Forces is the evolution to independent statehood within the British Commonwealth of Nations. This can be seen in customs and routine, uniforms and drill, organization and many other matters (eg, trooping the colours, gun salutes).
- **Royal Canadian Air Force.** Technical requirements of the Royal Canadian Air Force in 1941 called for speeding up the process of drill instruction and, at the same time, reducing the periods of practical training. Both of these objectives were attained by properly combining classroom instruction and parade ground training. The daily program of training was arranged to allow all personnel on strength to receive one hour of classroom instruction and parade ground training per week.

  In 1955, the classroom explanation was absent from the *Manual of Drill for the Royal Canadian Air Force*. When conducting drill training, the Royal Canadian Air Force used army drill and ceremonial procedures.

Instructional and practical drill training periods for the Royal Canadian Air Force were as follows:

- classroom instruction–45 percent (demonstration and explanation by instructor);
- practical training–25 percent (on the parade ground);
- mutual instruction–15 percent; and
- voice training–15 percent.

The foot and arms drill of the Royal Canadian Navy, Canadian Army and Royal Canadian Air Force were generally similar, being derived from the same tactical practices. When the three services were unified in 1968, evolution continued by blending the drill detail back into one standard of drill.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What did the Dutch create in the early 1600s?

Q2. What were the marches introduced by the British in 1824?

Q3. Whose drill manuals did the Canadian Armed Forces use before World War II?

ANTICIPATED ANSWERS:

A1. In the early 1600s, the Dutch created a book of drill. An artist was used to make engravings of each posture required of each drill movement, with the corresponding words of command below each picture. This material was then gathered and published into a book.

A2. The following marches were introduced by the British Army in 1824:

- march,
- quick march,
- wheeling step, and
- double march.

A3. With few exceptions Canada's Armed Forces used British Manuals (sometimes just with a Canadian cover and covering page) up until the end of WW II.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. How did the Chinese teach drill to large numbers of soldiers?

Q2. When did the Dutch start using words of command for drill?

Q3. Why did the British introduce the balance step?

ANTICIPATED ANSWERS:

A1. When drill and combat methods were taught, they were taught to 100 men at a time. After instruction to 100 men was complete, they were united with other companies which were comprised of 1 000 men. When the instruction to the 1 000 men was complete, they were combined with other regiments.

A2. The Dutch started using words of command for drill in the late 1500s.

A3. The British introduced the balance step because the soldiers were required to manoeuvre shoulder to shoulder over rough and uneven ground in disciplined ranks, while giving effective volley fire.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Drill procedures and movements are a large component of today's military. Learning about the purpose and evolution of drill will help you understand why so many drill movements are performed within the military today.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

A0-002 A-PD-201-000/PT-000 Director of History and Heritage 3-2. (2005). *The Canadian Forces manual of drill and ceremonial*. Ottawa, ON: Department of National Defence.

C2-249 ISBN 978-0674-5023-07 McNeill, W. (1997). *Keeping together in time: Dance and drill in human history*. Cambridge, MA: Harvard University Press.

SUMMARY OF SIGNIFICANT DRILL EVENTS

Date	People	Event
3000 BC	Mesopotamians	The earliest known drill movement was close-order drill (defined as shoulder to shoulder marching).
2400 BC	Romans	Realized the way to learn the required skills when deploying for battle was by training soldiers drill in formation.
1000 BC	Greeks / Romans	Infantry drill was practiced regularly and was very necessary to ensure that each soldier's movements matched those of the rest. Armoured soldiers, also known as spearmen, fought in close-order drill and marched in step to maintain an unbroken shield wall.
875 BC	Greeks / Romans	A new battlefield tactic (the bow and arrow) was introduced and a new style of warfare drill developed, which resulted in the establishment of the Cavalry. The Cavalry could attack from a distance, with the use of horses. They learned to do drill on the horses, control the horses and to aim and shoot their bow and arrow.
400 and 300 BC	Chinese	Most of China's drill movements were derived from the Romans and Greeks.
1300s	Swiss	Were the first modern soldiers to march to music.
1500s	Dutch	The first to use words of command for drill.
1600s	Dutch	An artist made engravings of each posture required for each drill movement, with the corresponding words of command below each picture. This material was gathered and published into a book.
mid 1800s	Germans (and Swiss)	Had the idea of having soldiers become instructors. This provided the opportunity to break down the drill movement(s), demonstrating for all soldiers to see and by allowing the leaders to call out the movements, "by the numbers".
late 1800s	British, Japanese and Chinese	Followed the Germans and the Swiss by having soldiers teach drill movements.
1824	British	The balance step (the slow march) was introduced as soldiers were required to manoeuvre shoulder to shoulder over rough and uneven ground in disciplined ranks, while giving effective volley fire.
early 1900s	Canadians	Canada's Armed Forces used British drill manuals (sometimes with just a Canadian cover and covering page).
1941	Canadians	Technical requirements of the Royal Canadian Air Force called for speeding up the process of drill instruction and, at the same time, reducing the periods of practical training.
1955	Canadians	The classroom explanation was absent from the *Manual of Drill for the Royal Canadian Air Force*.
1968	Canadians	The foot and arms drill of the Royal Canadian Navy, Canadian Army and Royal Canadian Air Force were generally similar, being derived from the same tactical practices. When the three services were unified in 1968, drill evolution continued by blending the drill detail back into one.

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 6

EO C408.02 – VIEW A RE-ENACTMENT THAT DEMONSTRATES THE HISTORY OF DRILL

Total Time: 90 min

THERE IS NO INSTRUCTIONAL GUIDE PROVIDED FOR THIS EO

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 1

EO M409.01 – IDENTIFY METHODS OF INSTRUCTION

Total Time: 60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Create a slide of Attachment A.

Photocopy and 3-hole punch the handouts located at Attachments B, F, G, and H for each cadet.

Make three copies of the Methods of Instruction Puzzle located at Attachment C for the activity in TP1 on two different colours of paper. Description sheets should be colour A and Typical Application sheets should be colour B.

Prepare the Methods of Instruction Puzzles using the directions located at Attachment C.

Make one photocopy of the methods of instruction information sheets located at Attachment E.

Provide binders for each cadet to collect all work in this performance objective.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An in-class activity was chosen for TPs 1 and 2 as it is an interactive way to review previously learned material and confirm the cadets' comprehension of new methods of instruction.

A group discussion was chosen for TP 3 as it allows the cadets to interact with their peers and share their knowledge, experiences, opinions and feelings about the application of various methods of instruction.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to identify the methods of instruction and select the appropriate method of instruction for a given topic.

IMPORTANCE

It is important for cadets to be aware of the various methods of instruction when filling an instructional role. Being able to select and apply each method will help the cadets prepare and deliver an effective lesson.

Teaching Point 1 **Conduct an activity where the cadets will review methods of instruction.**

Time: 10 min Method: In-Class Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to the review the methods of instruction previously taught in EO M309.02 (Identify Methods of Instruction).

RESOURCES

- Teaching = learning handout located at Attachment A,
- Methods of Instruction worksheet located at Attachment B,
- Methods of Instruction Puzzle located at Attachment C,
- Methods of Instruction Guide Attachment D (for instructor use only),
- OHP (if required),
- Envelopes,
- Binders,
- Pens / pencils,
- Tape, and
- Stopwatch.

ACTIVITY LAYOUT

Place the sample Methods of Instruction Puzzle (located at Attachment C) at the front of the classroom so it is easily accessible to all groups.

Set up two work stations and place the following at each station:

- Methods of Instruction worksheet located at Attachment B for each cadet,
- One envelope with the Method of Instruction Puzzle located at Attachment C, and
- One binder for each cadet.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into two groups.
2. Show the cadets the slide of Attachment A and ask the cadets to:
    a. determine what the cartoon is implying; and
    b. consider why varying teaching techniques can assist with learning.

3. Introduce the sample Methods of Instruction Puzzle by:

   a. pointing out the two top row categories: description and typical applications;

   b. identifying the first column as the six methods of instruction; and

   c. explaining the colour coding system by pointing out that all descriptions are colour A and all typical applications are colour B.

4. Have the groups race to complete the Methods of Instruction Puzzle, according to the following rules:

   a. Groups must place their pieces of the puzzle in the appropriate column and row.

   b. A group that is having difficulty may visit the sample located at the front of the classroom up to two times.

   c. A penalty of 30 seconds will be added to a group's time for each visit to the sample.

   d. The group that completes the puzzle correctly in the least time is the winner.

Attachment B is provided for the cadets who finish the puzzle early. Ask them to make personal notes on each method of instruction. It is not necessary to fully complete the sheet but it will be a useful reference in the future.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the activity will serve as the confirmation of this TP.

Teaching Point 2 **Conduct an activity where the cadets will describe methods of instruction.**

Time: 20 min Method: In-Class Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to introduce the cadets to methods of instruction.

RESOURCES

- Methods of instruction information sheets located at Attachment E,
- Methods worksheet located at Attachment F,
- Presentation aids,
- Markers,

- Pens / pencils, and
- Tape.

ACTIVITY LAYOUT

Set up six learning stations, to include:

- Flip chart paper,
- Markers, and
- Pens / pencils.

ACTIVITY INSTRUCTIONS

1. Write the following on the whiteboard / flip chart:

   "Tell me, and I forget;
   Show me, I may remember;
   Involve me, and I will understand." - Chinese Proverb

2. Ask the cadets the following questions:

   a. What are some possible meanings of the quote?

   b. What are the connections between learning and instruction?

3. Divide the class into six groups and assign each group a method of instruction, to include:

   a. group discussion,

   b. guided discussion,

   c. role-play,

   d. experiential learning,

   e. problem-based learning, and

   f. case study.

If the class size is small, divide the class into three groups and assign two methods to each group.

4. Have the groups title the flip chart paper with their given method of instruction.
5. Have the cadets write the following headings on the flip chart paper:

   a. description,

   b. applications,

   c. preparation and development, and

   d. pros and cons.

6. Have each group brainstorm and record ideas relating to each section of their flip chart paper.
7. Distribute the assigned method of instruction information sheet to each group.
8. Have each group read their method of instruction information sheet and add details to their flip chart paper.

Distribute the Methods worksheet to each cadet.

9. Display charts around the room.
10. Have each group present their method of instruction. Allocate about 1–2 minutes for each group presentation.
11. Instruct the cadets to fill in the Method worksheet, making short notes, as each group presents their method to the class.

It is not necessary for the cadets to fully complete the sheet but it will be a useful reference in the future.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 2

The cadets' participation in the activity will serve as the confirmation of this TP.

Teaching Point 3 **Conduct a group discussion on the application of methods of instruction.**

Time: 20 min Method: Group Discussion

BACKGROUND KNOWLEDGE

The point of the group discussion is to draw the following information from the group using the tips for answering / facilitating discussion and the suggested questions provided.

Some examples of the types of lessons that lend themselves easily to a specific method of instruction are:

Interactive Lecture. Lessons with facts or dates, including history lessons.

Demonstration and performance. Any drill or skill, such as first aid and rope work.

In-class activity. Lessons that lend themselves easily to using brainstorming, worksheets and group work. This type of lesson is used to reinforce instructional topics such as instructional technique and environmental stewardship.

Practical activity. Map and compass, and cool-down and warm-up activities for sports.

Game. Lessons that include labelling or defining terms and performance-based lessons.

Field trip. Visit an elemental museum, visit an airport or ship, and visit a college to view possible careers.

Group discussion. Benefits of healthy living, qualities of a good leader and environmental issues relevant to Canada.

Guided discussion. Explain personal integrity and explain decision-making processes.

Role-play. Influence behaviours, leadership scenarios, and history.

Experiential learning. Participating in citizenship activities and attending weekend training.

Problem-based learning. Teambuilding activities and leadership styles.

Case study. Characteristics of a leader and various events in history.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

Attachment G contains a list of possible criteria to consider when choosing methods of instruction. Distribute Attachment G to each cadet before discussing the questions.

Distribute the Method of Instruction Summary handout located at Attachment H. As the methods of instruction are being discussed, the cadets may record ideas for each one on the handout.

To facilitate the discussion, record ideas on a flip chart / whiteboard.

SUGGESTED QUESTIONS:

What methods of instruction do you like to participate in most? Why? Provide an example.

What methods of instruction were used to instruct this lesson? What evidence do you have?

Would you choose a different method of instruction for this lesson? What and why?

What criteria do you consider most / least important when choosing a method of instruction? Why?

Ask the following questions for each method of instruction:

1. What is an application of this method?
2. Why would you choose this method?
3. Does anyone disagree?
4. Would this application apply to another method of instruction? Why or why not?
5. Are there any other lessons that would fall into this method of instruction?

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 3

The cadets' participation in the group discussion will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' participation in the group discussion will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed in IAW A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, 409 PC.

CLOSING STATEMENT

It is pertinent to have an exposure to the various methods of instruction in order to be flexible as an instructor. Familiarity with these methods may improve the instructor's ability to select activities that are appropriate for lessons. While many lessons may be taught using more than one method of instruction, choosing the most appropriate method of instruction is key.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

A0-055 A-P9-050-000/PT-006 Director Training and Education Policy. (2002). *Canadian Forces individual training and education system* (Vol. 6). Ottawa, ON: Department of National Defence.

A0-123 A-PD-050-001-PF-001 Chief of Defence Staff. (2001). *Central flying school flight instructors handbook*. Winnipeg, MB: Department of National Defence.

C0-379 Kizlik, R. (2009). *Education Information for new and future teachers*. Retrieved February 26, 2009 from www.adprima.com

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Teaching = Learning?

Figure A-1 Teaching = Learning

Note: From *Tiger Comics* by Bud Blake. Retrieved March 10, 2009, from http://www.kingfeatures.com/features/comics/tiger/about.hml

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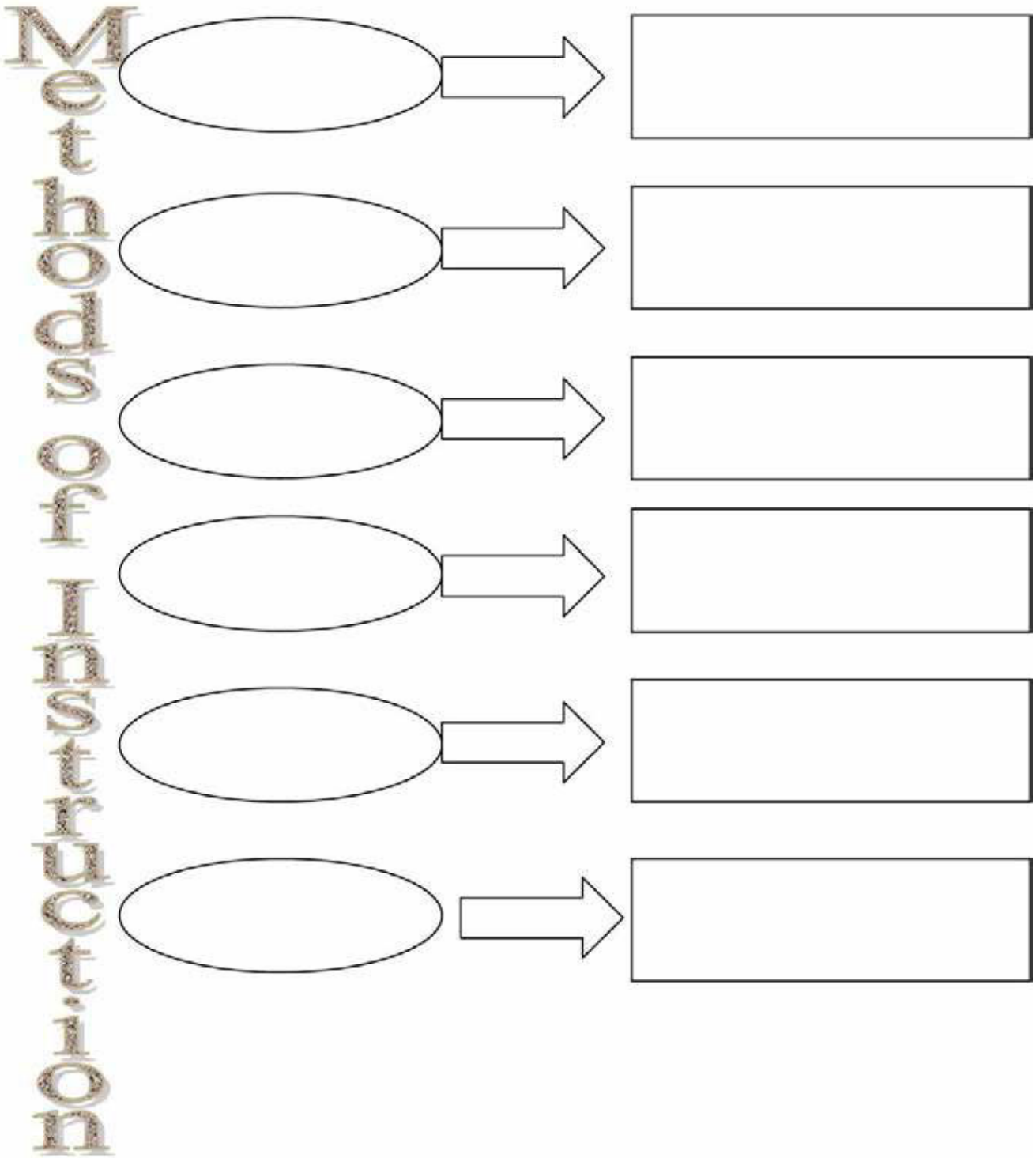
Name: _____

Place 6 methods of instruction in the circles. Then list two characteristics of each.



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METHODS OF INSTRUCTION PUZZLE

Directions

1. Photocopy three copies of Attachment C using coloured paper.

The top right-hand corner of each page indicates the colour paper to be used for each copy. The colours correspond with different sections of the puzzle as illustrated in Figure C-1.

2. Cut out each piece of the puzzle.
3. Refer to Attachment D to help with the assembly of the puzzle.
4. Assemble one puzzle to demonstrate to the class (as illustrated in Figure C-1).

	Description	Typical Applications
Interactive Lecture		
Demonstration and Performance	COLOUR A	COLOUR B
In-Class Activity		
Practical Activity		
Game		
Field Trip		

Figure C-1 Methods of Instruction Puzzle

Note. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

5. Put the other two sets of the puzzle pieces in two envelopes.

Interactive Lecture	Demonstration and Performance	In-Class Activity
Practical Activity	Game	Field Trip

DESCRIPTION
TYPICAL APPLICATIONS

DESCRIPTIONS

Is used with one or more participants to practice skills, apply strategies, and enhance teams. Supports learning through a challenging activity that allows for skill practice or knowledge confirmation.	A method where theoretical knowledge is reinforced through participation in an activity in a real-life setting.
An instructor-driven method that combines both lecture and interaction to meet lesson objectives. Examples include videos with discussion, games, learning stations, brainstorming, debating, group work and the completion of handouts.	This method involves observing the instructor and performing and rehearsing the task under the supervision of the instructor.

Colour A

DESCRIPTIONS

Colour A

Involves a wide variety of potential activity-based learning that can be used to support learning objectives. Encourages participation. Examples include learning stations, videos, brainstorming, debating, group work, and the completion of handouts.	This method includes a wide variety of activity-based learning opportunities that can be used to introduce new experiences.

TYPICAL APPLICATIONS

Colour B

Used to: • introduce a topic; • discover concepts and principles; • learn terminology; • recall terms; • recognize equipment parts; • carry out an application; • confirm learning; or • demonstrate a process.	Used to: • introduce / illustrate and confirm topics; • reinforce and clarify classroom learning; • inject variety into the situation; or • allow viewing of operations or equipment that cannot easily be shown in the classroom.
Used to: • introduce a subject; • present background information; • review previously taught material; • give instructions on procedures; or • illustrate the application of rules, principles or concepts.	Used to: • teach hands-on operations or procedures; • teach troubleshooting; • illustrate principles; • teach operation or functioning of equipment; or • teach safety procedures.

TYPICAL APPLICATIONS

Used to:	Used to:
• teach both knowledge and skill lessons; • reinforce instructional objectives; • introduce a subject and generate interest; • give background information; • illustrate application of rules, principles or concepts; or • create interactivity during a lecture.	• carry out an application; • demonstrate a process; • verify an explanation; • produce a product; • teach manipulative operations; or • teach procedures.

Color B

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METHOD OF INSTRUCTION
Interactive Lecture

DESCRIPTION	PRE-LESSON PREPARATION	TYPICAL APPLICATIONS	LESSON DEVELOPMENT
Interactive lecture is an instructor-driven method that combines both lecture and interaction to meet lesson objectives. The lecture portions of the lesson are offset with relevant activities such as videos with discussion, games, learning stations, brainstorming, debating, group work or the completion of handouts.	Use attention-getters such as interesting facts, statistics or rhetorical questions to begin the lecture or to introduce new teaching points. Prepare participatory questions to encourage cadet participation. Prepare evaluative questions for confirmation of teaching points. Obtain or develop training aids to clarify main points. Prepare an in-class activity to avoid lecturing too long. Practice delivering the material.	Interactive lectures can be used with different sizes of groups to: • introduce a subject; • present background information; • review previously taught material; • give instructions on procedures; • illustrate the application of rules, principles or concepts; or • introduce a demonstration, discussion or performance.	Begin the lesson and each new TP with an attention-getter. Use presentation aids such as: • flip chart, • whiteboard, and / or • electronic media. Pay attention to signals of alertness, such as: • cadets' facial expressions, and • cadets' body language. Deal with alertness problems by: • asking for questions; and • posing questions to the group. Use visual training aids at opportune moments. Integrate interesting facts with lesson material to maintain interest. Use participatory questions or a short activity to avoid lecturing too long. Use questions to confirm each teaching point. Confirm the lesson using questions or an activity.

METHOD OF INSTRUCTION
Demonstration and Performance

DESCRIPTION	PRE-LESSON PREPARATION	TYPICAL APPLICATIONS	LESSON DEVELOPMENT
Demonstration and Performance During demonstration and performance, the cadets observe the instructor performing the task in a demonstration, and rehearse it under the supervision of the instructor. **Demonstration Method** A method of instruction where the instructor, by actually performing an operation or doing a job, shows the cadet what to do, how to do it and explains why, where and when it is done. **Performance Method** A method in which the cadet is required to perform, under controlled conditions, the operations, skill or movement being taught.	The instructor must be skilled in the task. Gather all materials necessary to instruct the lesson. Break the task down into smaller sequential steps. Practice the lesson to ensure that steps are accurate and clear. Prepare a handout outlining the steps, if necessary. Organize the training area so that all cadets can: • see the demonstration, and • perform the task.	**Demonstration Method** Demonstration can be used to: • teach hands-on operations or procedures; • teach troubleshooting; • illustrate principles; • teach operation or functioning of equipment; • set standards of workmanship; • explain a theory or concept; or • teach safety procedures. **Performance Method** Performance can be used to: • teach hands-on operations or procedures; • teach operation or functioning of equipment; • teach skills; or • teach safety procedures.	Introduce the lesson by demonstrating what the cadets will be able to do at the end. Explain where the skill can be applied and why it is important. Provide a handout outlining the steps if the process is complex. Explain and demonstrate each step in a sequence. Allow cadets maximum time to practice the steps as soon as possible. Positively reinforce everything the cadets do correctly. Supervise the cadets as they practice, providing assistance or re-demonstrations when necessary. Have cadets perform the skill as confirmation. Encourage the cadets to practice beyond class time.

METHOD OF INSTRUCTION
In-Class Activity

DESCRIPTION	PRE-LESSON PREPARATION	TYPICAL APPLICATIONS	LESSON DEVELOPMENT
In-class activities encompass a wide variety of activity-based learning opportunities that can be used to reinforce and practice instructional topics or to introduce cadets to new experiences. In-class activities should stimulate interest among cadets and encourage their participation, while maintaining relevance to the performance objectives. Examples of in-class activities include learning stations, videos, brainstorming, debating, and group work.	Create an activity that involves all cadets, which can be conducted within the time allocated. Clearly specify the objective of the activity. Obtain all materials necessary to complete the activity. Write out specific instructions describing what participants are supposed to do. Write out specific directions for conducting the activity. Arrange for assisting staff, if necessary, to help conduct the activity. Prepare handouts for cadets containing background information. Organize the training area into work / learning stations.	An in-class activity can be used for both knowledge and skill lessons to: • reinforce instructional objectives; • introduce a subject and generate interest; • present background information; • give direction on procedures; • introduce a demonstration, discussion or performance; • illustrate the application of rules, principles or concepts; • create interactivity during a lecture; or • review, clarify or summarize information.	Introduce the activity to the whole group. Brief participants on what will be expected of them. Stress timings. Ensure all resources are available. Begin the activity. Supervise and assist the groups as required. Conclude the activity. Confirm the TP or lesson. Debrief the cadets.

METHOD OF INSTRUCTION
Practical Activity

DESCRIPTION	PRE-LESSON PREPARATION	TYPICAL APPLICATIONS	LESSON DEVELOPMENT
Practical activities encompass a wide variety of activity-based learning opportunities that can be used to reinforce and practice skills or to introduce cadets to new experiences. Practical activities should stimulate interest among cadets and encourage their participation, while maintaining relevance to the performance objective.	The instructor must be skilled in the task. Gather all materials necessary to instruct the lesson. Organize the training area so that all cadets will have space to perform the task safely. Ensure there is enough time to conduct the complete activity or breakdown the task into smaller stages. Prepare a handout outlining the steps, if necessary. Arrange for assisting staff, if necessary. Plan for composition of groups.	If it is used to teach new material, it must be combined with other methods to ensure cadets have the necessary background information to complete the activity. The practical activity method can be used to: • carry out an application; • demonstrate a process; • verify an explanation; • produce a product; • introduce a subject; • teach manipulative operations; • teach procedures; • teach troubleshooting; • illustrate principles; • teach equipment operation; or • teach safety.	Review background information. Distribute the handout, if necessary. Introduce the activity to the group. Stress safety. Brief the cadets on what they will be expected to do. Brief assisting staff on what they will be expected to do. Begin the activity. Supervise the cadets and provide assistance, if necessary. Watch for safety infractions and stop the activity, if necessary. Conclude the activity. Debrief the cadets.

METHOD OF INSTRUCTION
Game

DESCRIPTION	PRE-LESSON PREPARATION	TYPICAL APPLICATIONS	LESSON DEVELOPMENT
Games are used with one or more participants to practice skills, apply strategies and enhance teams. It is critical that the game supports learning through a challenging activity that allows for skill practice or knowledge confirmation.	Develop a simple game with the following characteristics: • is fast to play; • is easy and quick to organize; • has few rules; • uses minimal equipment; and • involves maximum participation. If possible, use variations of games cadets know from childhood or television. Determine the following when developing the rules of the game: • individual or team play, • how to change leaders, • what the leader will do, • what the followers will do, • timings for the game, • how to signal the start and stop of the game, • how to ensure safety. Obtain the resources needed to play the game. Organize the training area to play the game.	Games create variety and arouse interest but must also support learning. Games can be used to: • introduce a topic; • discover concepts and principles; • learn terminology; • recall terms; • recognize equipment parts; • develop strategies and tactics; • carry out an application; • demonstrate a process; • practice interpersonal skills; and / or • confirm learning.	Brief the cadets on the following: • the objective of the game, and • rules of the game. Play the game. Supervise closely to : • ensure that the game is played in the manner expected; • ensure that the game is played safely; and • ensure maximum participation. End the game. Debrief the cadets.

METHOD OF INSTRUCTION
Field TripField Trip

DESCRIPTION	PRE-LESSON PREPARATION	TYPICAL APPLICATIONS	LESSON DEVELOPMENT
Theoretical knowledge is reinforced through participation in an activity in a real-life setting. Prior planning helps to ensure all pre-training and safety standards are met. Field trip activities are planned and carried out to achieve clear instructional objectives that are understood by the cadets. Examples include trips to areas of local interest, flying / gliding, hiking and / or sailing.	Specify the objective(s) of the field trip. Determine the time and location of the field trip. Obtain necessary authorizations. Determine the timings. Determine the activities or demonstrations needed to achieve the objectives. Determine if trained personnel will be available to assist. Arrange the following, if necessary: • transportation, • supervision, and • meals. Determine if the cadets will be allowed to use equipment or participate in a training activity. Determine if all cadets can take part at once or if they need to rotate through. Divide the cadets into groups, if necessary. Ensure safety.	The field trip is used to: • introduce / illustrate and confirm topics; • reinforce and clarify classroom learning; • inject variety into the training situation; or • allow cadets to view operations or equipment that cannot easily be shown in the classroom.	Inform cadets as soon as possible of the following: • time of the field trip, • location of the field trip, and • timings for departure. Brief cadets on the following prior to departure: • objectives of the field trip, • timings and groupings for activities and demonstrations, and • how they will participate during the field trip. During the field trip ensure the following: • the safety of all cadets, • maximum participation, and • the objectives are met. After the field trip: • debrief the cadets; and • confirm that objectives have been met. Express appreciation to the facilitators of the field trip.

Guided Discussion

Description:

A method in which learners are guided in steps to reach instructional objectives by drawing out their opinions, knowledge, experience and capabilities, and by building on these to explore and develop new material. Learners discuss issues to expand their knowledge of the subject.

Applications:

- Develop imaginative solutions to problems (eg, through brainstorming).
- Stimulate thinking and interest and secure learner participation.
- Emphasize main teaching points.
- Supplement lectures, reading or laboratory exercises.
- Determine how well learners understand concepts and principles.
- Prepare learners to apply theory or procedure.
- Clarify or review points.
- Determine learner progress and the effectiveness of prior instruction.
- Foster attitudinal change.

Preparation and Development:

Reading material should be provided to learners in advance so that learners are familiar with the concepts that will be discussed.

To begin, an instructor should introduce the topic and scenario; outline the main discussion points; state the what, where and why of the lesson; and create an open environment.

During the body of the lesson, the instructor poses open lead-off questions to guide the discussion toward the aim. The instructor concludes the lesson by reviewing all the main points contributed by both the learner and instructor and by relating points back to the lesson aim.

Advantages:	**Disadvantages:**
• Increases cadet interest. • Increases cadet acceptance and commitment. • Uses cadet knowledge and experience. • Results in more permanent learning because of the high degree of cadet participation.	• Requires highly skilled instructors to redirect discussion using rephrased comments or summaries. • Requires preparation by cadets. • Limits content. • Consumes time. • May not accomplish goals. • Can get off topic. • Some members may not participate.

<table>
<tr><th colspan="2">Group Discussion</th></tr>
<tr><td colspan="2">Description:
A method to discuss issues and share knowledge, opinions and feelings about a topic in small groups. The instructor's questioning is flexible and minimal, and encourages reflection on personal experiences and opinions through peer interactions.</td></tr>
<tr><td colspan="2">Applications:
• Develops imaginative solutions to problems.
• Emphasizes main teaching points.
• Determines individual progress and the effectiveness of prior instruction.
• Prepares individuals for application of theory or procedure.</td></tr>
<tr><td colspan="2">Preparation and Development:
Prepare an issue or problem that will interest the cadets and stimulate discussion.
Organize cadets into small groups.
Put groups in circles or horseshoes.
Pose a lead-off question and encourage participation of all cadets.</td></tr>
<tr><td>Advantages:
• Increases cadet interest.
• Increases cadet acceptance and commitment.
• Uses cadet knowledge and experience.
• Results in more permanent learning because of the high degree of cadet participation.</td><td>Disadvantages:
• Requires highly skilled instructors.
• Requires preparation by cadets.
• Limits content.
• Consumes time.
• Restricts size of group.
• Requires selective group composition.</td></tr>
</table>

Problem-Based Learning

Description:

A method that facilitates the learning of principles and concepts by having learners work on solving a problem drawn from the work environment. Instructors must pose thought-provoking questions and guide cadets without influencing their decisions.

Applications:

It allows learners to:

- learn through practicing what they will have to do on the job;
- learn by imitating others' behaviour;
- learn from the feedback of others; and
- learn through practice and reflection on each scenario in which they participate.

Preparation and Development:

This method is usually conducted with small groups of 5–7 learners or with pre-established teams.

Instructors prepare carefully constructed problems that are realistic.

During the lesson, learners analyze the problem and work toward solving it.

Instructors facilitate learning by posing questions to get learners thinking and talking (eg, What are the clues, facts and any guesses about the problem and its causes? What other information is needed?). The instructor should ensure that all learners participate because discussion is key to learning, but they should try not to influence decisions. Instructors may also challenge learners' thinking by questioning learners without leading them to the correct answer (eg, What does this mean? What are the implications?).

Advantages:	**Disadvantages:**
• Encourages participation by cadets. • Maintains relevance to performance objectives. • Many resources are involved. • Problems are realistic for learners to relate to.	• Critical thinking skills are required. • Broad knowledge of the subject matter is required. • Instructors must be experienced in facilitating learning.

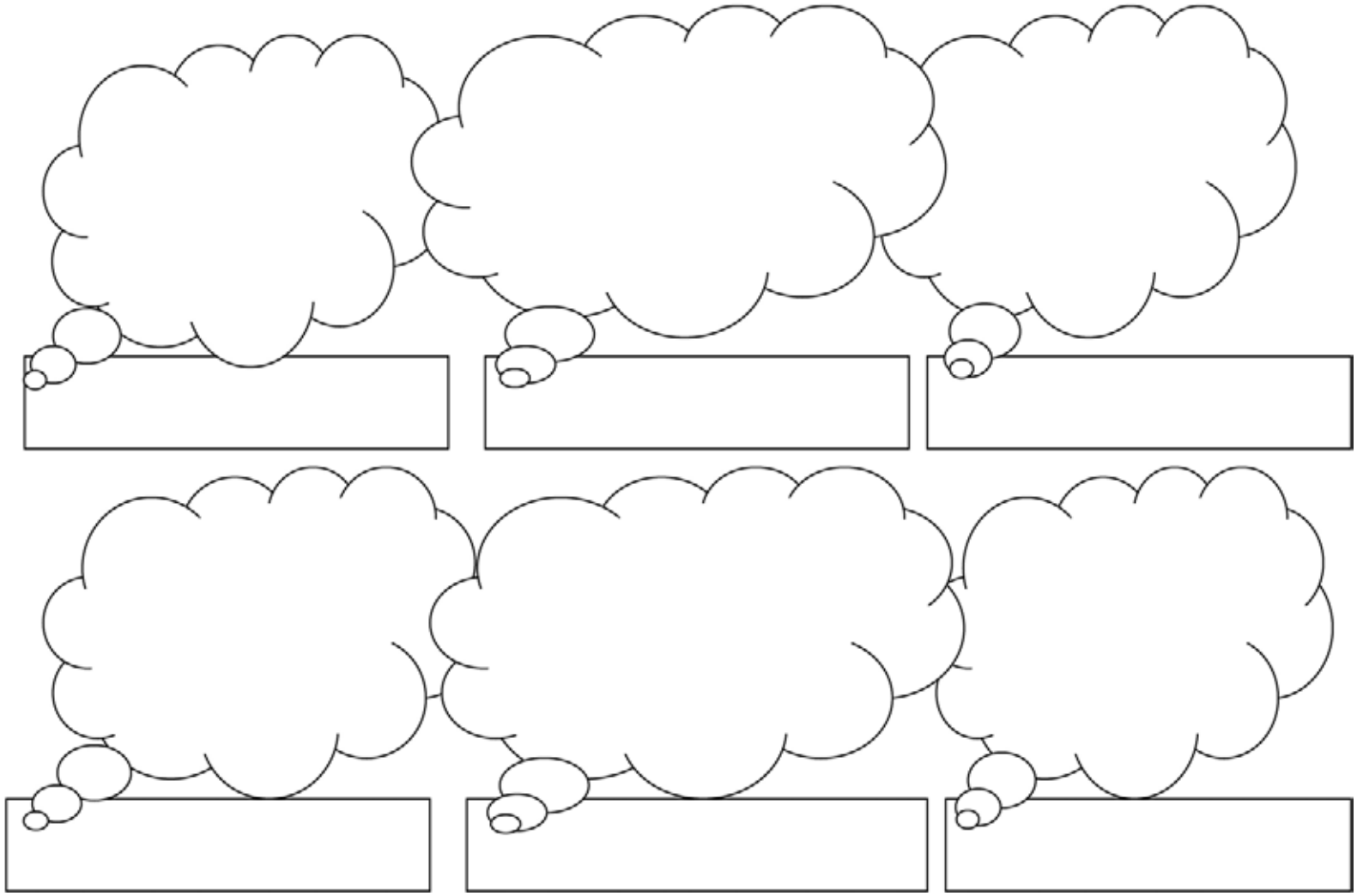
<table>
<tr><th colspan="2">Role-Play</th></tr>
<tr><td colspan="2">Description:
A method of interaction in which learners play out and practice realistic behaviors by assuming specific roles and circumstances.</td></tr>
<tr><td colspan="2">Applications:
It allows learners to:
• practice responding to various situations that are similar to those they will encounter; and
• develop human interaction skills.</td></tr>
<tr><td colspan="2">Preparation and Development:
Begin the lesson by clearly explaining the objective of the lesson (what, where, when and why). It is critical to explain that role-playing is a learning process and learners are not expected to play their roles perfectly from the start. This will help put learners at ease.
The instructor must clearly explain each role the learners will play. This is followed by a demonstration of the role-play either on video or through a live performance by instructional staff. Learners are paired or grouped together and the role-plays are cycled through. The instructor does not interfere during the role-play unless learners veer off topic, require cues or assistance, or a safety issue arises. Following each role-play, the instructor debriefs the learner on their performance. Correct behaviours should be positively reinforced, and areas requiring improvement identified.</td></tr>
<tr><td>Advantages:
• High participation, interactive delivery.
• May lead to discussions.
• Experience is developed in a supportive environment.
• Can be very versatile depending on the topic.</td><td>Disadvantages:
• Participants can be easily sidetracked.
• Needs a lot of preparation and controls must be clarified.
• Competent, experienced and prepared instructors are needed.
• Not always successful due to group composition.</td></tr>
</table>

<table>
<tr><th colspan="2">Experiential Learning</th></tr>
<tr><td colspan="2">Description:
A method using knowledge and skills to meet objectives. There are four stages to this method: concrete experience, reflective observation, abstract conceptualization, and active experimentation.</td></tr>
<tr><td colspan="2">Applications:
The method teaches:
• practical skills,
• transferable skills,
• problem solving, and
• process or principle.</td></tr>
<tr><td colspan="2">Preparation and Development:
Step 1: Concrete Experience. Individuals have an experience and take time to identify and define it.
Step 2: Reflective Observation. Provides time for individuals to reflect on visual, emotional, and cognitive aspects of the experience.
Step 3: Abstract Conceptualization. Individuals work to understand and make connections between the experience and prior experiences.
Step 4: Active Experimentation. Individuals look ahead to plan the application of skills and knowledge acquired for future experiences.</td></tr>
<tr><td>Advantages:
• Knowledge is shared by the participants.
• Most participants will create new knowledge.
• Everyone is actively involved in the teaching and learning process.
• Numerous resources are used.</td><td>Disadvantages:
• Expensive as it uses many resources.
• Requires a lot of planning, preparation and organization prior to the activity.
• The instructor must master the subject developed.
• May not be a good process for learning details.</td></tr>
</table>

<table>
<tr><th colspan="2">Case Study</th></tr>
<tr><td colspan="2">Description:
A method using a written problem, situation or scenario to achieve a performance objective.</td></tr>
<tr><td colspan="2">Applications:
• Used for learning principles, attitudes and concepts.
• Develops critical thinking and promotes teamwork.</td></tr>
<tr><td colspan="2">Preparation and Development:
Give a problem that matches the experience level of the cadets.
Provide time to analyze it.
Responses to the problem should be recorded under four headings:
1. Facts,
2. Assumptions,
3. Problems, and
4. Solutions.</td></tr>
<tr><td>Advantages:
• Cadets can help each other learn.
• High energy.
• Relates to real-life applications.
• Can be used for past, present and future applications.</td><td>Disadvantages:
• Must be well organized and facilitated to ensure learning takes place.</td></tr>
</table>

Methods

Write a method of instruction in each rectangle. Listen to each group present their method. In each cloud, list some characteristics defining the method.



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METHOD MADNESS

Topic: _____

Group Members: _____

Discuss the factors below in order to reach a decision on adopting a method of instruction.

Is the objective to: • provide theory? • manual or procedural skills? • develop concepts? • instill desired attitudes? • develop teamwork?	**What is the type of content:** • Knowledge? • Theory? • How difficult is it?
Know your cadets by determining the: • existing skill, knowledge and attitude level of the students, • class size, • behaviour, • qualifications, • experience, and • skill level.	**Establish Materials / Equipment / Facilities:** • What? • Where? • Available? • Time? • Is it critical?
Consider cost: • Are funds available? • Is it cost effective?	**Know your ability as an instructor by determining:** • Existing skill, knowledge and attitude level? • Behaviour? • Availability? • Qualification? • Experience? • Skill level?

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METHODS OF INSTRUCTION SUMMARY

Interactive Lecture. The instructor presents material such as events and facts and the cadets participate by responding to questions and engaging in discussion.

Examples:

Demonstration and performance. The instructor demonstrates a movement or skill, showing the cadet what to do, and explains, why, where and when it is applied. Then the cadets are given time to practice the movement or skill.

Examples:

In-class activity. A variety of activities that reinforce instructional topics.

Examples:

Practical activity: An interactive way to allow cadets to experience skill-based lessons.

Examples:

Game. Fun and challenging activity that allows for skill practice or knowledge confirmation.

Examples:

Field trip. Complements theoretical knowledge required by using concrete examples and allowing cadets to observe real-life applications of learning objectives.

Examples:

Group discussion. Cadets learn from peer responses, which provoke them to examine their own thoughts and experiences.

Examples:

Guided discussion. The instructor directs and stimulates the cadets' learning through a series of structured questions.

Examples:

Role-play. Cadets are assigned roles requiring them to interact with others in responding to various realistic situations.

Examples:

Experiential learning. Allows cadets to acquire new knowledge or skills through direct experience.

Examples:

Problem-based learning. Cadets analyze a problem and apply the steps in the problem-solving method.

Examples:

Case study. The primary purpose may not be to find a correct solution to the problem or issue posed, but to understand the principles involved in reaching a solution or analyzing an issue.

Examples:

COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 2

EO M409.02 – IDENTIFY ELEMENTS OF A POSITIVE LEARNING ENVIRONMENT

Total Time:	60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy the Create a Positive Learning Environment Crossword Puzzle located at Attachment B for each cadet.

Ensure the different types of attention signals described in TP 3 are available for this EO.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TPs 1 and 3 to provoke thought and stimulate the cadets' interest in the importance of a physically and emotionally safe learning environment and a well-managed classroom / training area.

A group discussion was chosen for TP 2 as it allows the cadets to interact with their peers and share their knowledge, experiences, opinions and feelings about stress management.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have identified the importance of a physically and emotionally safe learning environment, discussed various techniques to manage stress and discussed classroom / training area management techniques.

IMPORTANCE

It is important for the cadets to identify elements of a positive learning environment because it will provide them with specific instructional strategies for motivating and engaging the cadets, for conducting interesting lessons and for boosting the cadets' self-confidence and self-esteem.

Teaching Point 1 **Describe the importance of a physically and emotionally safe learning environment.**

Time: 15 min Method: Interactive Lecture

The cadets should be able to relate to sitting in a classroom trying to listen to an instructor who may have been knowledgeable about the subject but who was unable to engage them. Brainstorm with the cadets the reasons why they may have been unable to concentrate on the lesson. Draw out aspects of the environment such as lighting, ventilation, physical space, the instructor's attitude toward the group and the cadets' relationship with their peers. Explain that these are aspects of the learning environment that directly affect their ability to learn.

THE IMPORTANCE OF A PHYSICALLY AND EMOTIONALLY SAFE LEARNING ENVIRONMENT

"Everything we know or sense about the world comes to us, in one way or another, through the environment in which we live." (Bell, 2007, http://www.dialogueon learning.tc3.edu/model/environment/Introduction-grp.htm)

The learning environment includes the "physical environment" of the classroom or training area and the "emotional environment" that the cadets and instructor create in the classroom or training area. Aspects of the physical and emotional environment such as the lesson location, availability of resources, and cadets' level of stress and anxiety affect learning but are sometimes outside of the instructors' control. However, it is important that instructors try to minimize the effects of such hindrances to learning when they plan their lessons rather than simply know they exist and feel powerless to change them.

Physical Environment

The physical environment for cadet training will most likely change from training session to training session or even from lesson to lesson. Instructors fortunate enough to have a dedicated learning space will find it easier to create a stimulating physical environment, while others who are transient will find it more difficult. The first priority when considering the physical environment is safety. As a minimum standard the physical environment should have:

Adequate lighting. The connection between light and our emotions has long been recognized. Studies have also shown that learners perform better in brightly-lit learning environments than dimly-lit ones. It has also been shown that a learning environment with lots of natural light is more conducive to learning.

Good ventilation. It is important to be conscious of the temperature and air quality in a room because people are especially sensitive to these two elements. Cooler temperatures promote relaxation and receptivity while warmer temperatures promote acting out. If possible, open a window, turn on a fan or open a door to control temperature and air quality.

A colourful atmosphere. There is a connection between colour and moods and emotions. Warm colours (eg, red, orange, yellow) are exciting and may lead to acting out while cool colours (eg, blue, green, purple) are more relaxing. Researchers in brain-based learning suggest that the best colours for elements of the physical environment are yellow, light orange, beige or off-white. The cadets may react differently to the same colour depending on their emotional state. If cadets are feeling stressed, the colour red, for example, may bring out aggressive feelings but if they are relaxed, red can attract their attention.

The physical environment can be improved by adding colourful, visually appealing posters, pictures or other graphic images to the walls. If an instructor lacks control over these elements they should ensure that learning aids (handouts, electronic presentations, transparencies or flip charts) are colourful.

Flexible seating arrangements. The instructor should set up a learning environment that allows cadets to move quietly to take part in small and whole group learning activities. Having the cadets move from large to small group interactions will provide variety help them learn new material more efficiently.

Movement. Cadets learn better if there is movement during a period of instruction. The brain needs glucose, oxygen and water to function properly. Even if the air quality is good, the cadets may still be oxygen deprived because of improper breathing patterns caused by stress and anxiety. Lack of oxygen to the brain negatively impacts its ability to process information; increasing the flow of oxygen to the brain can improve its ability to process information. Physical activity is an excellent way to increase oxygen flow to the brain. Instructors can accomplish this by beginning their classes with 30–60 seconds of stretching or deep breathing and by taking breathing breaks during longer lessons or when they notice that the cadets' attention is lagging.

Water is also important for good brain functioning. Instructors should encourage the cadets to drink beverages, preferably water or fruit juices during lessons.

The brain consumes twenty percent of the body's energy.

Organize the cadets into pairs and have them alternate as they explain to one another how adequate lighting, good ventilation, colourful atmosphere, flexible seating arrangements and movement affect learning. Circulate around the room to get a sense of how well the cadets are processing the information. After all cadets have participated and all elements have been explained, continue with the lesson.

Emotional Environment

"Learning occurs best in an environment that contains positive interpersonal relationships and interactions, comfort and order, and in which the learner feels appreciated, acknowledged, respected and validated." (Earl, 2003, p. 39)

Instructors have a responsibility to make their classrooms as emotionally safe as possible so that learning can take place. If the brain senses a threat, it will ignore all other information to deal effectively with the threat. The perception of threat causes a "fight or flight" response which causes the body to transfer blood from the frontal cortex, or thinking part of the brain, to the bottom and back of the brain to prepare for survival. Any time cadets experience a sense of danger, whether physical or emotional, their bodies and brains react with this "fight or flight" response.

To maximize learning, instructors must create an emotional environment of relaxed alertness that allows the cadets to risk saying a wrong answer or solving a problem incorrectly. This is an emotionally safe learning environment.

Emotional safety is necessary for intellectual risk taking. (Earl, 2003, p. 103)

There are a number of strategies that can be used to achieve an emotionally safe learning environment. It is important for the instructor to:

Lead with a positive attitude. The cadets may have plenty of complications and negativity in their daily lives and will appreciate a positive environment with a positive and enthusiastic instructor. When instructors show interest in what they are teaching, the cadets will become interested as well.

Establish a friendly learning environment. The instructor should make it safe to learn by treating all cadets equally and respectfully and insisting that cadets treat one another in the same way. The instructor can build trust by keeping their word and by keeping information confidential if asked to do so. They should encourage the sharing of ideas, experiences and information and value the contribution of each learner. One simple thing that instructors can do is to be sensitive to the cadets' average attention span.

Use a maximum of one minute per year of age, as a guide, to get uninterrupted listening or active participation in an activity.

Make learning fun. The instructor should challenge the cadets with interesting activities that are not too easy or too difficult. They should try to challenge the cadets just beyond their present level of ability. If they are challenged too far beyond their level of ability, the cadets will give up but if they are challenged too little, they will become bored. Encourage the cadets to take risks and reward effort and energy as well as correctness. The instructor should listen empathetically by acknowledging nervousness, showing patience and being non-judgmental of the cadets' responses. In addition, the instructor should never single out cadets and always be attentive to those who seem isolated from the group. They should never use put-downs or sarcasm.

Instructors should keep the first challenge easy and the encouragement heavy and remember that they are students too but with the added responsibility of helping others learn.

Encourage supportiveness. The instructor should be supportive of the cadets and encourage them to be supportive of one another. Instructors can create a supportive environment by leading applause, thanking cadets for their input and rewarding effort.

Appeal to a variety of senses. The instructor should stimulate the cadets' senses in a variety of ways which will help them feel positive about the learning experience. As well, the instructor should be aware that the cadets will have different learning styles that should be catered to by using many different learning activities.

Provide feedback. The instructor's feedback should be specific and help the cadets compare their current progress to past performance rather than compare it to the performance of others. They should always be accurate and consistent and when they assign specific tasks to be done, they should tell the cadets that they will be coming back to check on their progress.

When providing feedback, the instructors should stress what is to be done rather than confuse the cadets by giving attention to what is not to be done.

Use encouragement. The instructor should use encouragement to boost the cadets' enthusiasm and self-esteem but must be careful not to confuse encouragement with reinforcement. Encouragement will make the cadets feel better but it will not improve their learning in the same way as providing specific feedback regarding a specific task. Instructors should be selective and provide encouragement when it is due to keep the cadets on track.

Instructors should encourage the cadets to look at incorrect responses or unsuccessful attempts at problem solving as research and not failure.

Communicate clear expectations and routines. A sense of safety comes from consistent and predictable behaviours on the part of the instructor. Instructors should not be too rigid but should develop consistent procedures for beginning lessons, getting the cadets' attention and handling disruptions and distractions. They should start every lesson by telling the cadets specifically what they will know or be able to do by the end of the lesson. They should conclude each lesson by reminding the cadets what they have learned or are able to do.

Provide processing time. Instructors should ensure that the cadets have enough time to process the information that they have just received. They should stop periodically during a lesson and allow the cadets to interact over new material which will help them store it in long-term memory for later recall. Instructors can use a variety of group or paired activities to enable the cadets to interact with one another. They can, for example, ask each cadet in a small group to successively respond to a question or comment on an idea. A variation of this type of interaction would be pairing cadets and having them respond alternately by listing one item of a series, by identifying a specific cause or effect of something or by providing a specific reason. The key is for the instructor to stop talking, ask a question, set a time limit and have the cadets interact in groups or pairs to process the information just presented.

Talking or lecturing beyond ten minutes is like pouring water into a glass that is already full.

Instructors must ensure, as much as possible, that the environment in which they instruct their lessons is learner friendly. The environment does affect learning and instructors must find ways to positively impact the learning environment for the cadets. The cadets should feel comfortable when giving answers, taking part in discussions and solving problems. Their incorrect responses to oral questions or attempts at solving a problem should not be put down or belittled but rather should be seen as the beginning of discovery.

Adult learners can overcome a poor learning environment because they are often self-motivated with a genuine interest in the subject or desire for personal gain. Cadets may not have a high degree of self-motivation so it is important to create a learning environment that will motivate them.

CONFIRMATION OF TEACHING POINT 1

Organize the cadets into pairs and have them alternately explain to one another two ways the instructor can establish a friendly learning environment, make learning fun and provide processing time.

Circulate around the room to get a sense of how well the cadets are processing the information. After all cadets have participated and the three items have been explained, continue with the lesson.

Teaching Point 2 **Conduct a group discussion on stress management techniques.**

Time: 15 min Method: Group Discussion

BACKGROUND KNOWLEDGE

The purpose of the group discussion is to draw the following information from the group using the tips for answering / facilitating discussion and the suggested questions provided.

STRESS

Stress is the body's reaction to a perception of a physical or emotional threat. The threat can be real or imagined; it is the perception of threat that triggers the stress response. During an acute stress response, the nervous system is activated automatically and the body experiences increased levels of cortisol, adrenalin and other hormones that produce an increased heart rate, quickened breathing rate and higher blood pressure. Blood is carried from the extremities to the big muscles preparing the body to fight or run away, which is commonly known as the "fight or flight" response. When the perceived threat is gone, our systems are designed to return to normal but this doesn't always happen because the threats can be frequent which causes constant anxiety.

Positive and negative stress are commonly labelled as eustress and distress respectively.

Eustress

Eustress is described as good stress and is created naturally when we participate in exciting but safe activities or when we trick the body into releasing small amounts of cortisol into the bloodstream. This type of stress pushes a person to do better and reach goals. Situations that might produce eustress include:

- riding a roller coaster;
- successfully completing an activity; or
- passing a test.

The prefix 'eu' in the word eustress is taken from the word euphoria which means a feeling of well being.

Distress

Distress is described as bad stress. This type of stress causes worry, anger or pain. Situations that might produce distress include:

- lack of sleep,
- accidents, or
- negative relationships with others.

Stress affects individuals differently. A situation that causes eustress for one person may cause distress for another.

TECHNIQUES FOR CREATING POSITIVE STRESS

Positive stress releases a small amount of cortisol into the bloodstream which can help the cadets learn more easily by improving their memory function. The instructor should use techniques, such as those described below, to create positive stress.

Design activities that challenge cadets. The instructor should design activities that challenge the cadets just beyond their present level of ability to encourage interest and prevent boredom.

Use movement. Instructors should incorporate movement into every lesson because it increases oxygen flow to the brain, which helps the cadets learn better. The movement should occur naturally during the lesson when the cadets are forced to stand up to give responses or move around to engage in a learning or confirmation activity. It does not have to be long but should be frequent during a lesson, which can have a cumulative effect on the brain.

Use music. Music, in addition to being enjoyable, has health benefits because it helps the body to produce cortisol. Instructors should have a good selection of music that they regularly use during their lessons as background noise or as an attention signal to begin a lesson or transition from one activity to another.

Breathe Properly. Breathing is how oxygen gets into the bloodstream to be delivered to the rest of the body. As automatic as it is, cadets may not be breathing well and should practice deep breathing activities to help increase oxygen flow.

Conduct a deep breathing activity by having the cadets:

1. lie on the floor on their back or sit in a comfortable position;
2. place one hand on their upper chest and one hand on their belly just above their waist;
3. breathe in slowly through their nose and feel the hand on their belly rise;
4. breathe out slowly through their mouth and feel the hand on their belly gradually lower; and
5. repeat steps three and four a few times.

If this activity is too disruptive or time consuming, simply encourage the cadets to take a few deep breaths periodically throughout a lesson to get more oxygen from the bloodstream to the brain, which will improve brain function.

TECHNIQUES FOR CONTROLLING NEGATIVE STRESS

If threats, or the perception of threats, are persistent, stress will become long term or chronic. The body can handle temporary or acute stress but not chronic stress and it may become ill. At the least, chronic stress impedes learning and must be prevented. In addition to using some of the techniques described above to create good stress, instructors should incorporate the following in their lessons to manage negative stress.

It is estimated that ninety percent of doctors' visits are for conditions in which stress, at least, plays a role.

Inform cadets of expectations. Instructors must clarify their expectations and communicate them to the cadets. Be specific, when assigning tasks, about what cadets will be expected to do, how they will be assessed and how they will receive extra training if necessary. Develop routines for beginning a lesson, transitioning from one activity to another during a lesson, getting the cadets' attention, dealing with different types of learners and ending a lesson. Routines may be repetitive and the cadets may complain at first, but routines that are realistically developed and consistently applied will allow the cadets to predict what will happen, which will ease their stress.

Provide necessary resources. The instructor must clearly and specifically inform the cadets what is expected of them and ensure that the cadets have all the material they need to complete the learning activity. The cadets will have limited time to complete the activity and will become frustrated if they have to collect material or improvise on their own. The instructor must ensure that all necessary equipment and supplies are readily available in the learning environment.

Provide adequate time to accomplish the task. When determining the amount of time for a task a good rule to follow is to assign one minute for each year of age. If an activity is long it should be broken down into manageable tasks.

Incorporate physical activity. The instructor should ensure that cadets move during every class either naturally as part of an activity or artificially when they notice the cadets' attention lagging.

Provide time to process information. Give the cadets enough time during a task to interact with their peers, in some way or another, over the content to help move it into long-term memory. This can be accomplished in a number of ways such as group interactions or some form of paired sharing. The important thing is to prevent time from becoming a hindrance to learning.

Practice relaxation techniques. There are a number of relaxation techniques to control negative stress. The benefit of such techniques is that they trick the body into thinking that the threat is gone and the increased blood circulation carries more oxygen to the brain, which allows the body to relax.

GROUP DISCUSSION

TIPS FOR ANSWERING / FACILITATING DISCUSSION:

- Establish ground rules for discussion, eg, everyone should listen respectfully; don't interrupt; only one person speaks at a time; no one's ideas should be made fun of; you can disagree with ideas but not with the person; try to understand others as much as you hope they understand you; etc.
- Sit the group in a circle, making sure all cadets can be seen by everyone else.
- Ask questions that will provoke thought; in other words avoid questions with yes or no answers.
- Manage time by ensuring the cadets stay on topic.
- Listen and respond in a way that indicates you have heard and understood the cadet. This can be done by paraphrasing their ideas.
- Give the cadets time to respond to your questions.
- Ensure every cadet has an opportunity to participate. One option is to go around the group and have each cadet answer the question with a short answer. Cadets must also have the option to pass if they wish.
- Additional questions should be prepared ahead of time.

SUGGESTED QUESTIONS:

Q1. What is stress?

Q2. How does breathing deeply help create positive stress?

Q3. What are five things instructors can do to control negative stress?

Q4. How can practicing relaxation techniques help control negative stress?

Q5. How does music create positive stress?

Other questions and answers will develop throughout the group discussion. The group discussion should not be limited to only those suggested.

Reinforce those answers given and comments made during the group discussion, ensuring the teaching point has been covered.

If time allows, conduct an activity where the cadets will practice one of the relaxation exercises described in Attachment A.

CONFIRMATION OF TEACHING POINT 2

The cadets' participation in the group discussion will serve as the confirmation of this TP.

Teaching Point 3 **Identify classroom / training area management techniques.**

Time: 20 min Method: Interactive Lecture

The classroom / training area for cadets may vary from session to session or even lesson to lesson depending on the type of training being conducted and the space available at the unit. Even if the instructor has the luxury of a dedicated space, it is important that they develop a classroom / training area management plan that will maximize the time available for a lesson. A management plan will prevent the instructor from wasting time getting the cadets' attention, transitioning from one activity to another, handling distractions and dealing with different types of learners.

A management plan should include the following but can be more detailed.

ATTENTION SIGNALS

Attention signals will work only if the cadets know what to do upon hearing or seeing the signal and the instructor has a positive expectation of success. If you do it, but do not actually expect the cadets to give you their attention, most likely they will not.

The instructor may find it useful to use an attention signal which immediately captures the cadets' attention when beginning a lesson, giving instructions, passing on information or transitioning from one activity to another. The attention signal should be both auditory and visual and the cadets should be taught to stop talking, stop working and establish eye contact immediately upon hearing and seeing the signal. Such an approach, when it becomes entrenched into the lesson's routine, will prevent the instructor from becoming frustrated and will help establish a calm tone for the lesson. The attention signal should be used consistently whenever there is a need to get the cadets' attention. The following attention signals may be used:

- **Raising a hand.** The instructor can simply raise their hand or raise their hand and say, "high five." Immediately upon hearing the phrase "high five" and seeing the instructor's hand go up the cadets should stop talking or moving, look at the instructor, raise their hand and repeat the phrase "high five" and keep their hand raised until the group is ready.
- **Flicking the light switch.** Immediately upon seeing the lights go on and off, the cadets should stop talking or moving and look at the instructor until the group is ready. An accompanying verbal command may include "high five" or some other phrase.
- **Sounding a bell, playing a musical tone or playing part of a song.** Immediately upon hearing the bell, musical tone or part of a song, the cadets should stop talking or moving and look at the instructor until the group is ready.
- **Clapping a rhythm.** The instructor claps a rhythm (dut, dut, dut, dut, dut). Immediately upon hearing the clapped rhythm the cadets should stop talking or moving, clap either a responding rhythm (dut, dut) or repeat the rhythm the instructor clapped and then look at the instructor until the group is ready.

- **Whistling.** Immediately upon hearing the whistle the cadets should to stop talking or moving and look at the instructor until the group is ready.

Use one of the attention signals and have the cadets respond with the appropriate behaviour or play the chorus from the song "Respect", have the cadets repeat "R-E-S-P-E-C-T" when they hear it and look at the instructor until the group is ready.

This is not an exhaustive list of attention signals. Some of the signals described above may be too childish for some groups. When deciding on a signal, consider the age, experience and maturity level of the group. Additional research of attention signals and experimenting with the group may help find one that works.

CORRECTING BEHAVIOUR

Instructors must be able to resolve disagreements, draw attention to the merits of differing opinions and maintain control of the classroom. They should prepare ahead of time and have a contingency plan for a range of behaviours similar to those listed below:

LEARNER BEHAVIOUR	SOLUTIONS
Quick Learner The cadet who consistently grasps concepts quickly and finishes work first could become disruptive if they begin to feel bored and unchallenged.	Provide this cadet with more advanced work. Ask this cadet to help others who require help. Have extra work prepared that reinforces the lesson.
Quiet Learner The cadet who rarely participates because they are shy, afraid, self-conscious or introverted.	Determine the cadet's interest and make it a topic for a group discussion. Discreetly encourage them to speak on the topic during the discussion asking questions that require short answers but occasionally ask more detailed questions.
Helpful Learner The cadet who is eager to help and agrees with everything the instructor says.	If the cadet is truly a generous person, explain in private that their behaviour is appreciated but could be misinterpreted by the group. If the cadet is trying to gain the favour of the instructor, advise the whole group that only merit will be rewarded.
Monopolizer The cadet who is always ready to express their views and can end up monopolizing the lesson.	Pose questions to this cadet that require only brief "yes" or "no" answers.

Critical Learner The cadet who consistently finds fault with the content or method of instruction.	Listen to the cadet's problems and satisfy them, if possible. If not possible, admit there are areas to be improved and ask for suggestions and solutions. Advise the cadet that you would be happy to discuss these issues after the lesson.
Know It All The cadet who considers themselves an authority on any topic being discussed and disrupts the class.	Determine if the cadet is knowledgeable or simply trying to get attention. Allow the cadet to answer some questions but allow other cadets to respond as well.
Distracter The cadet who attempts to get the group off topic. The cadet may do this to avoid revealing that they have not completed the assigned work or to avoid a difficult subject.	Recognize the types of questions that appear to relate to the lesson but will actually veer off topic. Acknowledge that the question does not relate to the topic but offer to discuss it after the lesson.

Organize the cadets into pairs and have them alternately describe to one another the different types of learners. Circulate around the room to get a sense of how well the cadets are processing the information. After all cadets have participated and the different types of learners have been described, continue with the lesson.

PROVIDING POSITIVE REINFORCEMENT

Deal with inappropriate academic performance and / or behaviour by emphasizing what is expected of the cadet rather than concentrating on what the cadet did wrong. The feedback should be:

- accurate,
- age-appropriate,
- specific, and
- consistent with the instructor's personal style.

It is extremely frustrating for cadets to be advised that their performance is unsatisfactory but to not know why. Instructors must:

- specifically and clearly identify what aspect of a performance is incorrect; and
- specifically and clearly identify what the cadet must do differently.

The cadets should also be asked to identify their own mistakes and explain why they made the error. In addition, the cadets should also be given the opportunity to:

- explain how to perform the task correctly; and
- practice the correct procedure.

ENGAGING THE CADET

Cadets are engaged when they are moving around or working in groups to manipulate information physically and mentally. Instructors can enhance learning by engaging in activities such as those described below.

Jigsaw worksheets. Instead of having cadets complete a worksheet individually, break them into small groups and assign a portion of the worksheet to each group. Each group must complete its assigned portion of the worksheet and use a poster or some other presentation aid to present the information to the whole group.

Graphics. Have the cadets create graphic organizers such as webs or mobiles to summarize information.

Creative writing. Have the cadets create rhymes, poems or songs to summarize information. If you are teaching terminology, symbols or similar information, have the cadets write a fairy tale or children's story using the information.

Create a chart. The instructor should type chronological information using a large font and cut it up into strips. Organize the cadets into pairs or small groups and give each pair or group an envelope with the strips of information and have them work together to place the information in the correct order and paste it on a sheet of chart paper or bristol board. Time the activity for fun.

Information chain. Have each cadet write one fact that they have learned during the class on a piece of coloured paper if possible. Have the class line up in front of the room and invite the first cadet to read their slip then fold it into a link and staple it. Invite the next student to read a fact and attach it to the chain and continue in this fashion until all cadets have created a link.

Scavenger hunt. Teach identification lessons such as parts of a rifle or parts of an airplane by planting clues around the room and having cadets engage in a scavenger hunt. The clues may be actual items or pictures of items. When cadets find an actual item or some representation of it, they must describe the item to the group.

Road trip. Create a road trip. Place stop signs around the room containing information describing what the cadet must do. The cadets will travel to each place, complete the activity and have their passport stamped.

Organize the cadets into pairs and have them alternately explain to one another the different ways instructors can engage cadets. Circulate around the room to get a sense of how well the cadets are processing the information. After all cadets have participated and all activities have been explained, continue with the lesson.

MANAGING DISTRACTIONS

The best way for instructors to manage distractions is to prevent them from occurring by engaging the cadets in learning. Use attention signals to get the cadets' attention at the beginning of a lesson, while conducting an activity during a lesson and when transitioning from one activity to another. Instructors can prevent distractions by developing and consistently using routines that help cadets to predict the instructor's behaviour. Disruptions often occur when the cadets move from one activity to another during a lesson. Instructors should structure transitions by answering the following questions:

- Can the cadets talk during transitions?
- How can the cadets get the instructor's attention during a transition?
- What is the purpose of the transition?
- Can the cadets move during the transition?
- What is the desired behaviour during a transition?

Once a procedure has been established, the instructor should teach the cadets the structure through direct instruction and patient practice until the group responds appropriately. A possible approach to teaching transitions could include:

- calling the cadets to attention with the attention signal;
- numbering the cadets and assigning each number a specific task;
- informing the cadets of the rules regarding talking and moving around the room;
- informing the cadets of the procedure for getting the instructor's attention; and
- informing the cadets of the time permitted for the transition.

Instructors should encourage the cadets either individually or collectively when they may not expect it. Such encouragement may be particularly rewarding and will be considered genuine because it is attached to past behaviour and not necessarily designed to provoke further activity from the cadet.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. What is an attention signal?

Q2. Identify one solution for dealing with cadets who get finished before others and become disruptive.

Q3. Identify two questions instructors should answer to structure transitions.

ANTICIPATED ANSWERS:

A1. An attention signal is a visual or auditory signal that immediately captures the cadets' attention when the instructor begins a class, gives instructions, passes on information or transitions from one activity to another.

A2. Solutions include:

- providing the cadet with more advanced work;
- asking the cadet to help others; or
- having extra work prepared that reinforces the lesson.

A3. Can the cadets talk during transitions?

How can the cadets get the instructor's attention during a transition?

What is the purpose of the transition?

Can the cadets move during the transition?

What is the desired behaviour during a transition?

END OF LESSON CONFIRMATION

Have the cadets complete the Create a Positive Learning Environment Crossword Puzzle located at Attachment B.

Review answers using the Create a Positive Learning Environment Crossword Puzzle Answer Key located at Attachment C.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, 409 PC.

CLOSING STATEMENT

Creating a positive learning environment requires planning and work by instructors. A safe, respectful and positive learning environment is more than a boost to self-confidence and self-esteem or a way to make learning fun—it is the cadet's right and an excellent way to make them want to learn.

INSTRUCTOR NOTES / REMARKS

Nil.

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RELAXATION EXERCISES

Rag Doll

1. Sit in a chair (or stand) with feet apart.
2. Stretch the arms and trunk upward and inhale.
3. Exhale and drop the body forward. Let the trunk, head and arms dangle between the legs, keeping the muscles relaxed (as illustrated in Figure 1).
4. Remain in this position for 10–15 seconds.
5. Slowly roll up, one vertebrae at a time.

Figure A-1 Rag Doll

Note. From *Fitness for Life: Updated Fifth Edition* (p. 300), by C. Corbin, & R. Lindsey, 2007, Windsor, ON: Human Kinetics. Copyright 2007 by The Cooper Institute.

Neck Roll

1. Sit in a chair or on the floor with legs crossed.
2. Keeping the head and chin tucked, inhale and slowly turn the head as far left as possible (as illustrated in Figure 2).
3. Exhale and turn the head to the centre.
4. Repeat steps 2–3 for the right side.
5. Repeat steps 2–4 three times, trying to turn further each time to feel the stretch in the neck.
6. Drop the chin to the chest and inhale while slowly rolling the head in a semicircle to the left shoulder and exhale while slowly rolling the head back to the centre.
7. Repeat step 6 for the right side.

Do not roll the head backward or in a full circle.

Figure A-2 Neck Roll

Note. From *Fitness for Life: Updated Fifth Edition* (p. 300), by C. Corbin, & R. Lindsey, 2007, Windsor, ON: Human Kinetics. Copyright 2007 by The Cooper Institute.

Body Board

1. Lie on the right side with arms over the head (as illustrated in Figure 3).
2. Inhale and stiffen the body like a wooden board.
3. Exhale and relax the muscles and collapse.
4. Let the body fall without trying to control the direction (as illustrated in Figure 4).
5. Lie still for ten seconds.
6. Repeat steps 1–5 for the left side.

Figure A-3 Body Board Start Position

Note. From *Fitness for Life: Updated Fifth Edition* (p. 301), by C. Corbin, & R. Lindsey, 2007, Windsor, ON: Human Kinetics. Copyright 2007 by The Cooper Institute.

Figure A-4 Body Board Finish Position

Note. From *Fitness for Life: Updated Fifth Edition* (p. 301), by C. Corbin, & R. Lindsey, 2007, Windsor, ON: Human Kinetics. Copyright 2007 by The Cooper Institute.

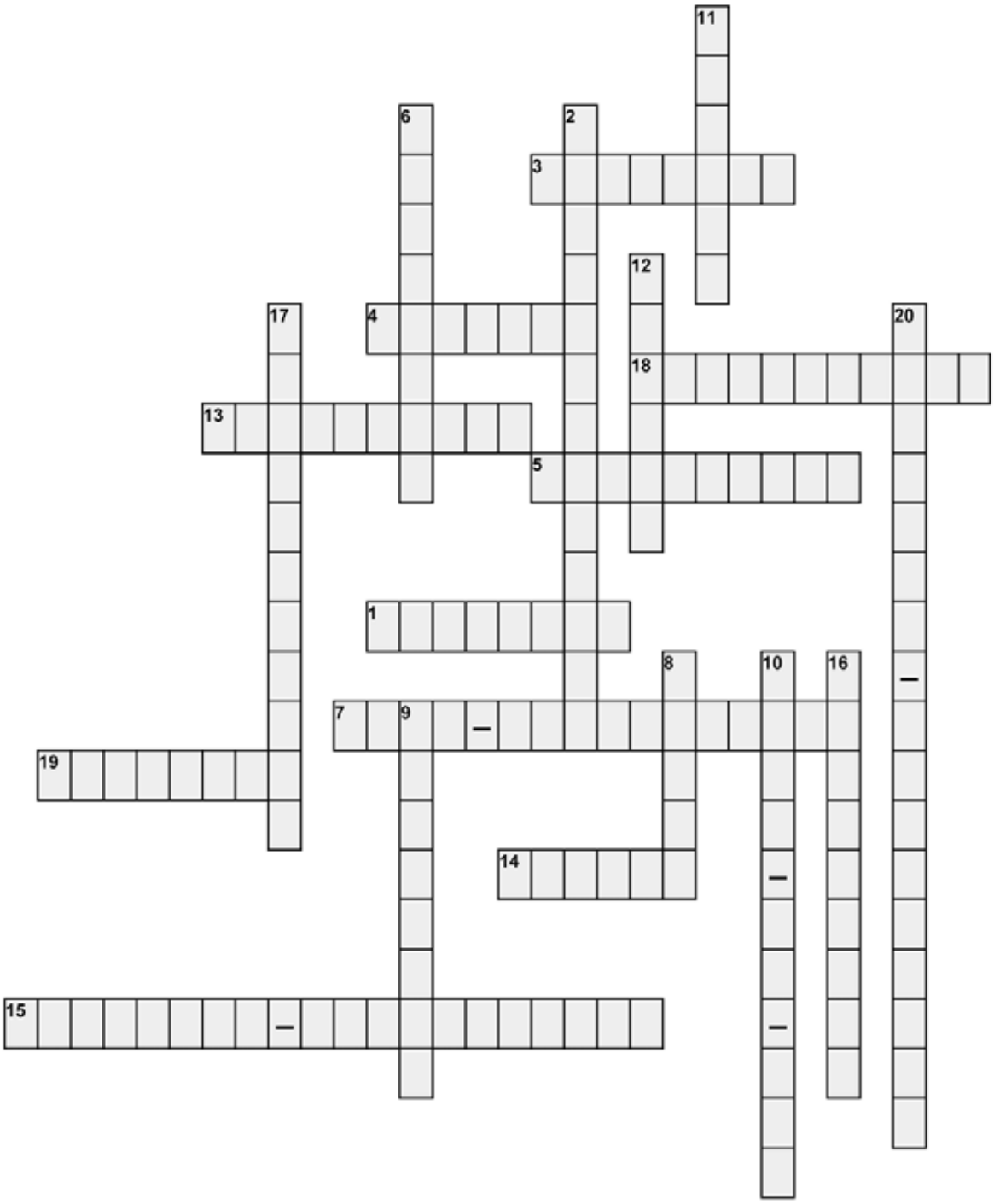
Jaw Stretch

1. Sit in a chair or on the floor with head up and arms and shoulders relaxed.
2. Open mouth as wide as possible and inhale.
3. Relax and exhale slowly.
4. Shift the jaw to the right as far as possible and hold for three seconds (as illustrated in Figure 5).
5. Repeat step 4 for the left side.
6. Repeat steps 4–5 ten times.

Figure A-5 Jaw Stretch

Note. From *Fitness for Life: Updated Fifth Edition* (p. 301), by C. Corbin, & R. Lindsey, 2007, Windsor, ON: Human Kinetics. Copyright 2007 by The Cooper Institute.

CREATE A POSITIVE LEARNING ENVIRONMENT CROSSWORD PUZZLE



Word List

physical environment, relaxation, movement, brain, stress, relaxed alertness, memorable, past performance, predict, processing, eustress, distress, cortisol, visual, know it all, specific, self-esteem, quiet learner, emotionally, oxygen

Clues

Across:

1. Furniture should be arranged to allow for _____.

3. Positive stress is called _____.

4. Using consistent routines will help cadets _____ instructor behaviour.

5. Cooler temperatures lead to this _____.

7. Feedback should help cadets compare current progress with _____.

13. Moving information from working memory to long term memory is called _____ information.

14. Deep breathing helps get _____ into the blood stream.

15. The place where a lesson takes place is _____.

18. Reinforcement boosts learning but encouragement boosts _____.

19. Music and movement help the body to produce _____.

Down:

2. The cadet who rarely participates is called a _____.

6. Negative stress is called _____.

8. 20% of the body's energy is consumed by the _____.

9. Feedback should be accurate, age-appropriate, consistent and _____.

10. Cadets who think they are authorities on any topic are called _____.

11. Fight or flight is the body's response to _____.

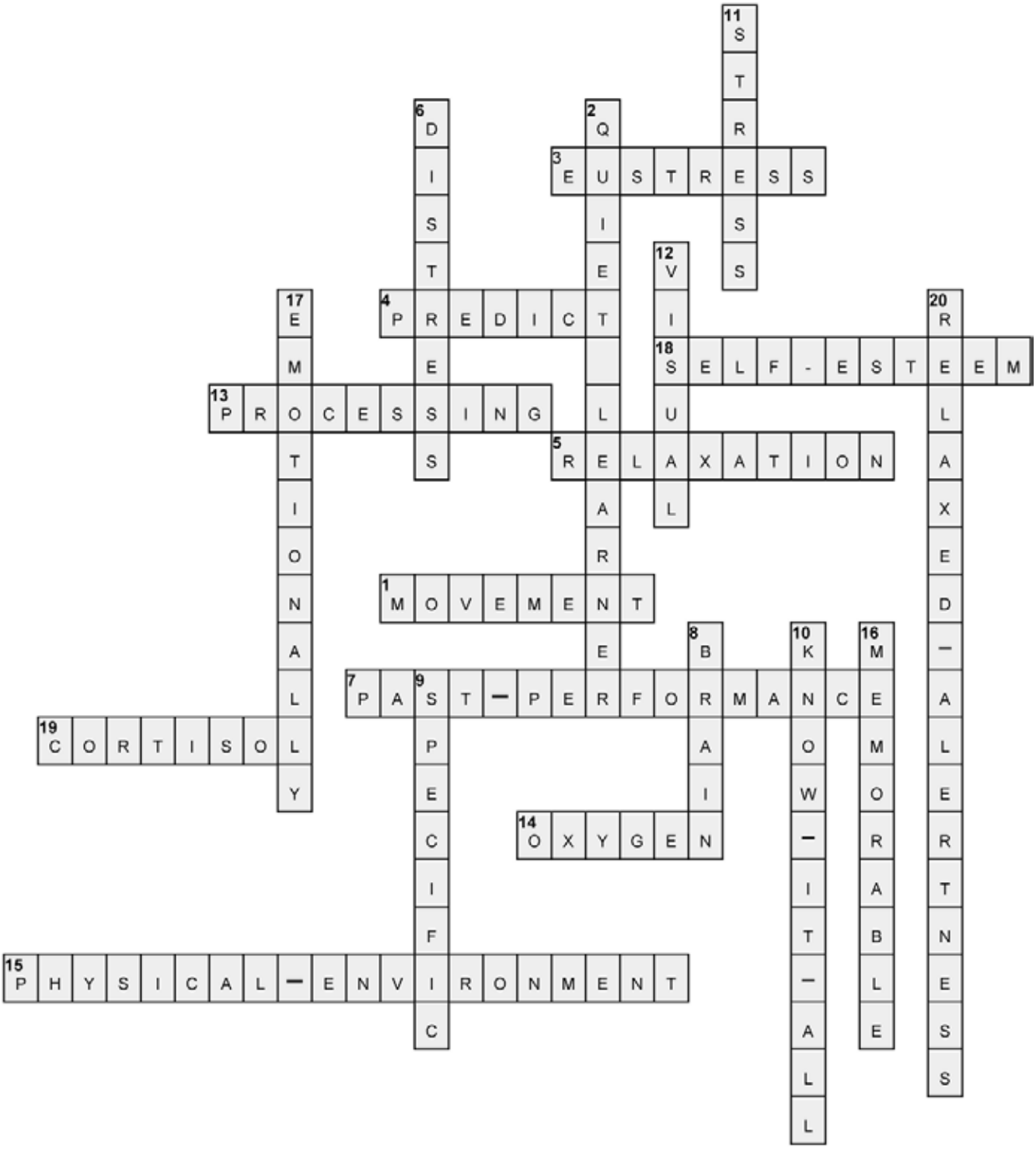
12. Attention signals should be both auditory and _____.

16. When our senses are stimulated the learning experience will become more _____.

17. When cadets feel comfortable and relaxed the environment is said to be _____ safe.

20. To maximize learning the emotional environment should create _____.

CREATE A POSITIVE LEARNING ENVIRONMENT ANSWER KEY



CREATE A POSITIVE LEARNING ENVIRONMENT ANSWER KEY (CONT'D)

Clues

Across:

1. Furniture should be arranged to allow for _____. (MOVEMENT)

3. Positive stress is called _____. (EUSTRESS)

4. Using consistent routines will help cadets _____ instructor behaviour. (PREDICT)

5. Cooler temperatures lead to this _____. (RELAXATION)

7. Feedback should help cadets compare current progress with _____. (PAST PERFORMANCE)

13. Moving information from working memory to long term memory is called _____. (INFORMATION PROCESSING)

14. Deep breathing helps get _____ into the blood stream. (OXYGEN)

15. The place where a lesson takes place is _____. (PHYSICAL ENVIRONMENT)

18. Reinforcement boosts learning but encouragement boosts _____. (SELF-ESTEEM)

19. Music and movement help the body to produce _____. (CORTISOL)

Down:

2. The cadet who rarely participates is called a _____. (QUIET LEARNER)

6. Negative stress is called _____. (DISTRESS)

8. 20% of the body's energy is consumed by the _____. (BRAIN)

9. Feedback should be accurate, age-appropriate, consistent and _____. (SPECIFIC)

10. Cadets who think they are authorities on any topic are called _____. (KNOW IT ALL)

11. Fight or flight is the body's response to _____. (STRESS)

12. Attention signals should be both auditory and _____. (VISUAL)

16. When our senses are stimulated the learning experience will become more _____. (MEMORABLE)

17. When cadets feel comfortable and relaxed the environment is said to be _____ safe. (EMOTIONALLY)

20. To maximize learning the emotional environment should create _____. (RELAXED ALERTNESS)

COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 3

EO M409.03 – DESCRIBE LEARNER NEEDS

Total Time: 60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four QualificationStandard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Create slides of Attachments A and H.

Photocopy and three-hole punch Attachments B, D, E, F, I and K for each cadet.

Photocopy Attachment C and cut into strips.

Make two copies of Attachments J and L.

Ensure that the cadets bring the binder provided in EO M409.01 (Identify Methods of Instruction).

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TPs 1 and 2 to introduce, provoke thought and stimulate the cadets' interest in learner needs.

An in-class activity was chosen for TPs 3 and 4 as it is an interactive way to provoke thought and stimulate interest in the different types of learners and how to meet their needs.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadets shall have described how developmental periods and learning styles determine learner needs.

IMPORTANCE

Instructors must develop an appreciation for all learning styles in order to meet learner needs. Being aware of developmental periods will provide instructors with the necessary tools to plan relevant and meaningful lessons.

Teaching Point 1 **Describe the importance of making material relevant and meaningful, and providing information processing time.**

Time: 5 min Method: Interactive Lecture

Display the slide of Tiger Comic located at Attachment A to focus the cadets' thoughts toward the learning process.

Learning is a complex process. There are many theories about how learning occurs. Determining what is relevant is the first step to ensure that the learning is meaningful. Understanding the age appropriate learning categories provides some insight into how the brain is working to process information.

RELEVANT LEARNING

Relevant. Determining why and if the material is necessary to know. Once this is determined the learner decides whether or not they engage in committing the information to memory.

Albert Einstein said, "Everything should be made as simple as possible, but not simpler."

In other words, teach to the level of the cadets. The level of difficulty determines whether or not the cadets engage in the lesson. Essentially, less is more when it comes to new material.

MEANINGFUL LEARNING

Providing meaningful and relevant material results in greater overall retention.

Learning becomes meaningful when cadets understand material and store it in the brain. A learning experience is meaningful when the learners engage in three processes:

1. reflecting upon prior knowledge;
2. relating to real-life experiences; and
3. applying knowledge in future experiences.

Retention is the ability to remember material after the material is presented. The more information is repeated, the better the retention. Most scientists believe that the pruning is guided both by genetics and by a use-it-or-lose-it principle.

Display the following on flip chart paper / white board.

Learners retain:

- 10% of what they read,
- 26% of what they hear,
- 30% of what they see,
- 50% of what they see and hear,
- 70% of what they say, and
- 90% of what they say and do.

Information is stored in different places in the brain depending on the type of information. Emotions have a great influence on learning. The stronger the emotions connected with an experience, the stronger the memory.

Various types of information are associated with a specific type of memory (as illustrated in Figure 1).

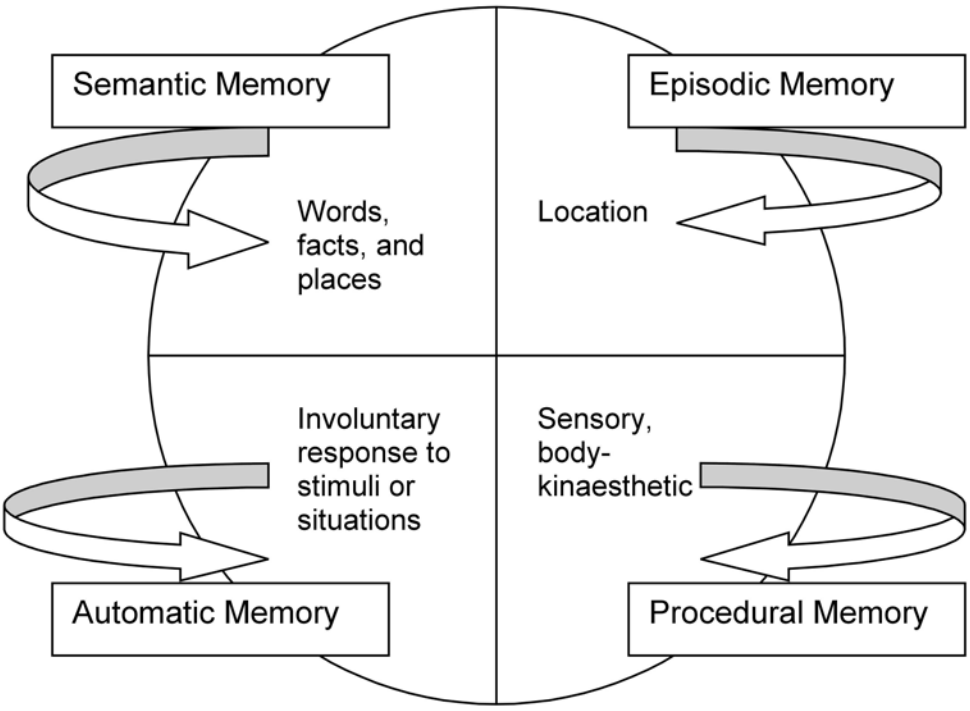


Figure 1 Types of Memory

Note: Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

PROCESSING TIME

Attention span. The average attention span is about one minute per year of age to a maximum of 15 years.

Allowing time for cadets to apply their learning is important so they can move information from their working memory to their long-term memory. The processing time is known as "thinking about thinking", where cadets can reflect on the lesson and plan, monitor, and evaluate their own thinking and learning.

Distribute the Learning Pyramid located at Attachment B to show the relationship between learning and remembering.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What does relevant mean?

Q2. What three processes involve the learner to have a meaningful learning experience?

Q3. What is retention? How is it increased?

ANTICIPATED ANSWERS:

A1. Determining why and if the material is necessary to know. Once this is determined the learner will decide whether or not they will engage in actually committing the information to memory.

A2. The learner actively:

a. reflects upon prior knowledge;

b. relates to real-life experiences; and

c. applies knowledge in future experiences.

A3. Retention is the ability to remember material after it is presented. The more information is repeated, the better the retention.

Teaching Point 2 **Describe and identify the needs of the developmental periods (DP).**

Time: 10 min Method: Interactive Lecture

DESCRIBE DEVELOPMENTAL PERIODS (DP)

The mental, physical, emotional and social development of a cadet are considered when determining a DP. They are age-based and focus on refining higher-level thinking skills such as reasoning, reflective thinking, and problem solving. The three are also known as age-appropriate learning categories (as illustrated in Figure 2).

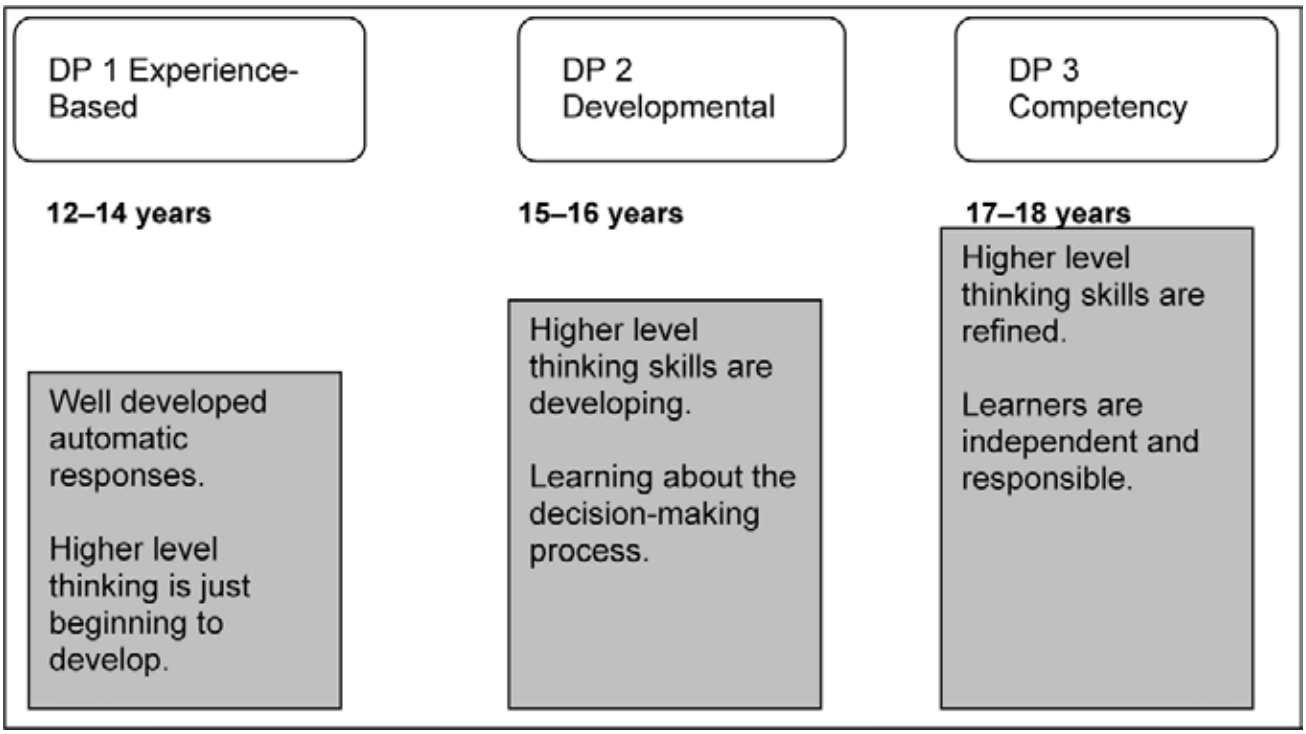


Figure 2 Identifying DPs

Note: Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

An instructor must plan their lessons based on the DP of the cadets. When planning a lesson it is important to consider what type of activities and questions to ask. For example, each DP indicates how long an activity should last:

- **DP 1.** Activities in a lesson should end in that same lesson.
- **DP 2.** Activities started in a lesson may extend over two to three lessons.
- **DP 3.** Activities started in a lesson may extend over four or more lessons.

NEEDS OF DPs

The following information focuses on DPs 1 and 2 only since the cadets will not be planning lessons for cadets in DP 3.

Experienced-based DP 1 (12–14 years):

- understand what is concrete / real not abstract;
- have mastered reflexive responses;
- require close supervision;
- want interaction and activity in lessons; and
- are very "me" oriented.

Developmental DP 2 (15–16 years):

- in a transition period—moving from understanding the concrete to understanding the abstract;
- beginning to use higher level thinking skills and are comfortable with the concrete;
- want to practice and explore new thinking skills;
- begin to understand cause and effect relationships;
- concerned with fairness—value system kicks in—need for equality for all; and
- asking questions like "how do I fit in?" and "how does this affect me?"

Four areas to consider when teaching within these DPs are:

- active and interactive lessons,
- structured activities,
- the opportunity for choice within the lesson, and
- goals definition.

Each area varies from low to high depending on the age and DP. However, active and interactive lessons are emphasized in all three DPs.

Lessons are planned by incorporating criteria based on the DPs (as illustrated in Figure 3).

Criteria for Activities	Experience-Based	Developmental	Competency
Active and Interactive	yes	yes	yes
Structured	very	some	cadet-run and supervised by officers
Provide Choice	minimal	some	much
Goals	clear and concrete	clear	abstract

Figure 3 Needs for Developmental Periods

Note: Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

ACTIVITY

Time: 5 min

OBJECTIVE

The objective of this activity is to have the cadets describe and identify the DPs.

RESOURCES

Developmental Periods Confirmation strips located at Attachment C.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Distribute the strips of paper from Attachment C to the cadets.

There are only 10 strips. If there are more than 10 cadets they may work in pairs / groups. If there are less than 10 cadets, some cadets may have more than one strip.

2. Ask the cadets who have a DP to come forward and tape their strip on the board.
3. Ask each cadet to read each strip to the class and decide what DP it describes. If the cadet is having difficulty, other cadets may help.
4. Once a decision has been made, tape the strip under the respective category.

CONFIRMATION OF TEACHING POINT 2

The cadets' participation in the activity will serve as the confirmation of this TP.

Teaching Point 3 **Conduct an activity where the cadets will describe and identify the needs of the different learning styles.**

Time: 20 min Method: In-Class Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to have the cadets describe and identify the needs of learners.

RESOURCES

- Learning Styles Information Sheet located at Attachment D,
- Learning Styles Survey located at Attachment E,
- How to Make a Jumping Frog located at Attachment F,
- How to Make a Triangular Box located at Attachment G,
- Slide of *Schoolies* comic located at Attachment H,
- Letter size paper for each cadet,
- Square sized sticky notes (eg, size 3 inches by 3 inches), and
- Sticky notes–4 inches by 6 inches.

In this lesson, sticky notes are used instead of origami paper (which is optimal). However, if sticky notes are not available, cut any paper according to the sizes recommended above.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Distribute the Learning Styles Information Sheet located at Attachment D. Read through the handout together.

2. Distribute the Learning Style Survey located at Attachment E. Have the cadets read each question and choose the most appropriate answer. Once they have answered all questions, have the cadets total each letter to determine their individual learning style.

3. Designate three areas of the classroom to represent each learning style: visual, kinaesthetic, and auditory. Have the cadets move to the group that reflects their learning style as indicated in the survey.

The groups should be uneven. Compare class results with the distribution of learning style percentage as indicted in the Learning Styles Information Sheet located at Attachment D.

4. Have the cadets return to their seats.

5. Distribute a piece of letter size paper, three square sticky notes, and one 4 inch by 6 inch sticky note to each cadet.

The activities are intended to allow the cadets to experience difficulty while using each one of the learning styles. Emphasis is on the cadets experiencing each learning style and not the completion of each activity. It is not important for the cadets to complete each activity, since they are for initial experiences only. Allot 2–3 minutes for each activity.

6. Have the cadets experience the auditory learning style by:

   a. listening to the directions to make a paper object;

   b. performing the direction as it is said; and

   c. refraining from asking questions as the directions are being given.

For this activity, have the cadets use the letter size paper. Read the following directions aloud to the cadets on how to make a paper boat:

1. Fold a piece of paper in half, from top to bottom.
2. Fold the right corner into the middle of the paper.
3. Fold the left corner into the middle of the paper.
4. Fold the bottom of the paper up against both sides.
5. Insert thumbs into the bottom to make a square.
6. Fold the bottom corners over each other to create a triangle.
7. Insert thumbs into the bottom to make a square.
8. Hold the paper with flaps down.
9. Fold the corners to the top point.
10. Pull the middle out to form a square.
11. Pull the two triangles at the top apart to create a boat.

For the next activity, have the cadets use the 4 inch by 6 inch sticky notes. Distribute How to Make a Jumping Frog located at Attachment F to each cadet.

7. Have the cadets experience the visual learning style by:
   a. seeing pictures to make a jumping frog;
   b. reading the directions to make a jumping frog; and
   c. performing the task without assistance.

For the next activity, have the cadets use the square sticky note. Use How to Make a Triangular Box located at Attachment G and demonstrate each step so the cadets can see.

8. Have the cadets experience the kinaesthetic learning style by:
   a. watching the instructor make a triangle box without verbal or written directions, and
   b. performing the task without assistance.
9. Discuss the cadets' feelings towards each of the learning styles by provoking these thoughts:
   a. What learning style was dominant in each of the activities?
   b. What task was most difficult?
   c. What task was the easiest?

Display the slide of *Schoolies* comic located at Attachment H.

CONFIRMATION OF TEACHING POINT 3

The cadets' participation in the activity will serve as the confirmation of this TP.

Teaching Point 4 **Conduct an activity where the cadets will identify how to structure a lesson to meet the needs of the different types of learners.**

Time: 15 min Method: In-Class Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to have the cadets identify how to structure a lesson to meet the needs of types of learners.

RESOURCES

- Instructor Tips for Learning Styles worksheet located at Attachment I,
- Instructor Tips for Learning Styles Answer Key located at Attachment J,
- Activities in Developmental Periods worksheet located at Attachment K,
- Activities in Developmental Periods Answer Key located at Attachment L,
- Flip chart paper,
- Stopwatch,
- Markers, and
- Pens / pencils.

ACTIVITY LAYOUT

Set up workstations by taping flip chart paper around the classroom.

The number of workstations can be determined by dividing the class number by two or four. For example, if the class size is small divide by two, and if it is large divide by four.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into two groups by assigning each cadet a number: Number 1 or Number 2. Arrange the cadets so that each group is sitting on opposite sides of the classroom.

2. Distribute the Instructor Teaching Tips for Learning Styles worksheet located at Attachment I to the cadets in Group 1 and the Activities in Developmental Periods worksheet located at Attachment K to Group 2.

3. Have the cadets work in their groups to fill out their worksheets.

Allocate two minutes for the cadets to work on the worksheets. It is not important to fully complete the sheets.

4. Distribute the answer keys located at Attachments J and L to one cadet in each group.

5. Have the cadet with the answer key in the each group read out the correct answers while the other cadets mark their worksheets and fill in any missing answers.

6. Have the cadets pair up with a cadet from the other side of the classroom and move to one of the workstations.

When the class size is large, two pairs can be assigned to each work station.

7. Give the cadets 2–3 minutes to explain on the chart paper how a DP 1 lesson would be structured differently than a DP 2 lesson. The cadets may use ideas from the worksheets and handouts in the class.

8. Have each group discuss their ideas for 2–3 minutes.

Distribute the remaining copies of Attachments I and K to those cadets that did not receive them earlier in the activity.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 4

The cadets' participation in the activity will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' participation in the in-class activities will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard Plan*, Chapter 3, Annex B, 409 PC.

CLOSING STATEMENT

Understanding what makes information relevant and meaningful is important when it comes to instructing. Defining learning styles and identifying developmental stages helps identify instructional strategies that will meet the learners' needs and ultimately provide them with a healthy and welcoming learning environment.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

A0-118 Director Cadets 3. (2007). *Youth reference guide*. Ottawa, ON: Department of National Defence.

C0-397 Belding, S. (2004). *Stickiness: Skills retention and synthesis*. Retrieved March 23, 2009, from http://www.airs.org/files/public/Making_Training_Stick.pdf

C0-398 ISBN I-57517-344-1 Burke, K. (2000). *What to do with the kid who*.... Arlington Heights, IL: Skylight Professional Development.

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TIGER COMIC

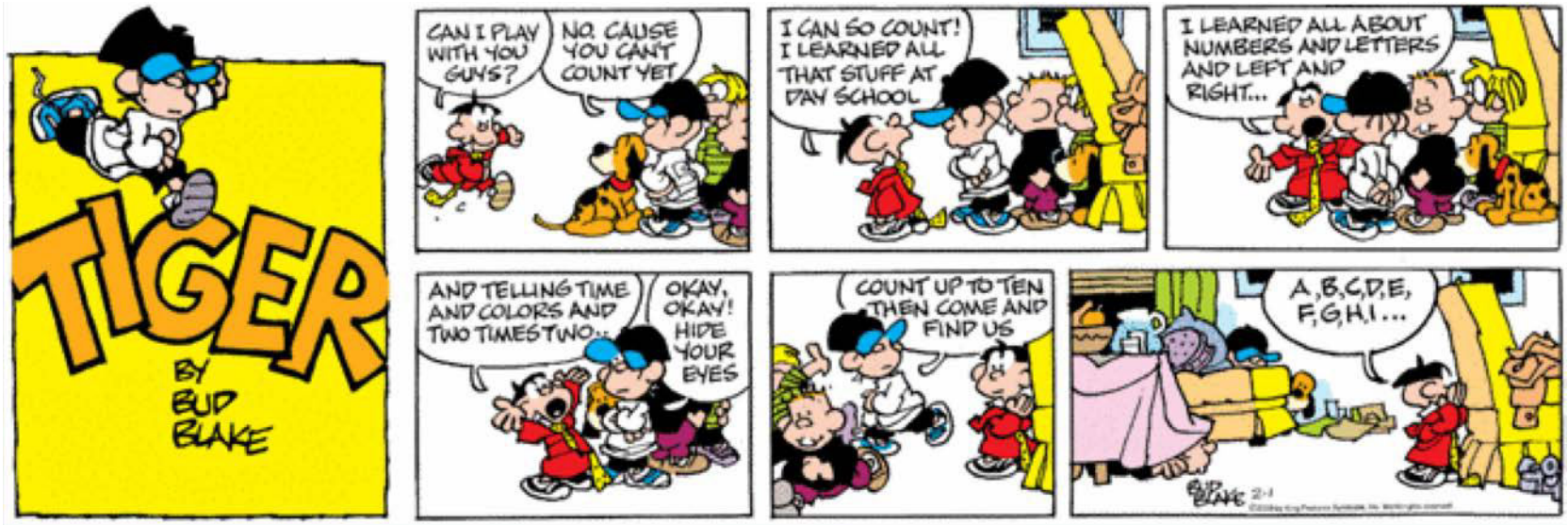

Figure A-1 Hide and Seek

Note. From *Tiger* Comics by B. Blake. Retrieved March 10, 2009, from http://www.kingfeatures.com/features/comics/tiger/about.hml

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LEARNING PYRAMID

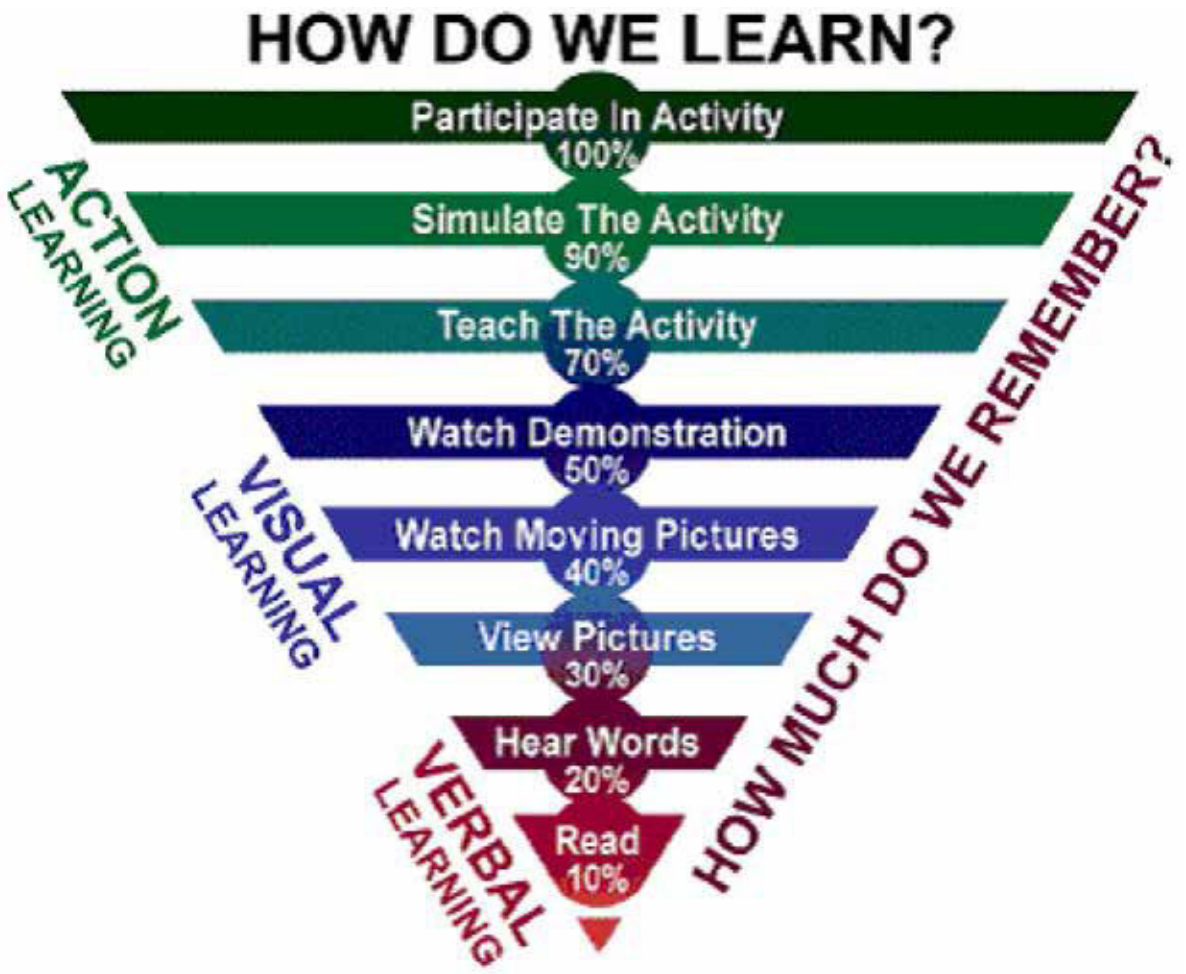

Figure B-1 Learning Pyramid

Note. From *Engage Educate Empower*, 2007, Copyright by Life Adventure Centre 2009. Retrieved March 11, 2009, from http//www.lifeadventure center.org

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DEVELOPMENTAL PERIODS CONFIRMATION

Cut out each strip and place in an envelope. Use page C-3 as a reference during the activity.

12–14 years Experience-Based
Effective learning experiences for cadets at this stage should be achievable, active and fun.
It is important to note that these cadets are just developing the area of the brain associated with higher level thinking skills.
Require close supervision.
Activities in the lesson should end in the same lesson.

DEVELOPMENTAL PERIODS CONFIRMATION

Cut out each strip and place in an envelope. Use page C-3 as a reference during the activity.

15–16 years Developmental
Cadets in this stage are ready to start learning about and practising reasoning and problem-solving skills.
Cadets want to practise and explore new thinking skills
Concerned with fairness; the value system kicks in where they need equality for all.
Cadets ask question like "how do I fit in?" and "how does this affect me?

DEVELOPMENTAL PERIODS CONFIRMATION ANSWER KEY

12–14 years Experience-Based
Effective learning experiences for cadets at this stage should be achievable, active and fun.
It is important to note that these cadets are just developing the area of the brain associated with higher level thinking skills.
Require close supervision.
Activities in the lesson should end in the same lesson.

15–16 years Developmental
Cadets in this stage are ready to start learning about and practising reasoning and problem-solving skills.
Cadets want to practise and explore new thinking skills
Concerned with fairness; the value system kicks in where they need equality for all.
Cadets ask question like "how do I fit in?" and "how does this affect me?

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LEARNING STYLES INFORMATION SHEET

Understanding the different learning styles can help make a more effective instructor. For example, being aware of how cadets process information allows the instructor to design lessons and activities that present information in a variety of ways to address as many learning styles as possible. Learning occurs using the senses. The three learning styles use seeing, hearing and touching. Seeing corresponds to visual learners, hearing corresponds to auditory learners and touching corresponds to kinaesthetic learners.

Visual Learners:	Auditory Learners:	Kinaesthetic Learners:
• are described as readers and observers; • learn through seeing; • think in pictures; • benefit from and enjoy visual aids; and • are better at reading than listening.	• are described as listeners and talkers; • process information through their ears; • are good working in louder environments; • are great socialisers; and • need to ask questions to confirm learning.	• are described as doers; • learn through moving, touching and doing; • process information through their muscles; and • learn best when combining muscles with reading or talking.

Figure D-1 Learning Styles

Note. Adapted from *Cadet Program Reference Guide*. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

The differences between the three learning styles are illustrated in Figure D-2.

	VISUAL	**AUDITORY**	**KINAESTHETIC**
Decision Making	Create a chart of the possible alternatives; write out pros / con.	Talk over options with a friend.	Try out options—go with the path that seems best.
Asking Directions	Prefer a map / written directions.	Prefer verbal instructions.	Prefer to have someone take them the first time.
Learning a New Skill	Watch someone else do it, follow a diagram in a manual.	Attend a lecture; have someone talk them through the steps.	Try this and that until it works.

Figure D-2 Learning Styles and Instructional Activities

Note. From *Cognitive Preference*. Retrieved March 10, 2009, from http://www.georgebrown.ca/saffairs/stucuss/learningstyles.aspx.

To process information, a combination of the three senses are used, signifying that no learning style is completely independent. Each individual has a dominant learning style that represents how they process information most / how they learn best. Most of the population learn best by seeing and are therefore visual learners. When preparing a lesson, the instructor must keep in mind that it is best to provide multiple opportunities for all three styles of learning.

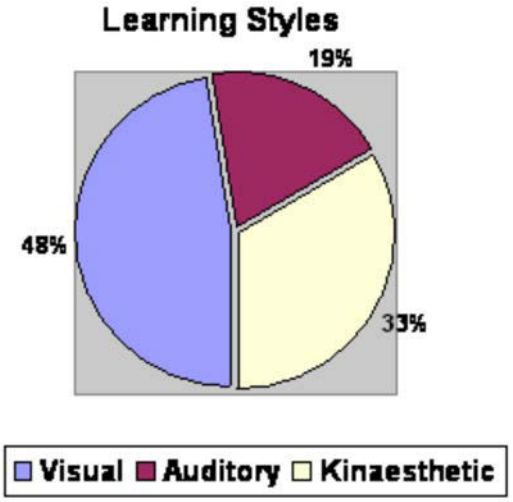

Figure D-3 Dominant Learning Style

Note. Adapted from *Cadet Program Reference Guide*. Created by Director Cadets 3, 2009, Ottawa, ON: Department of National Defence.

LEARNING STYLES SURVEY

Directions. Select the answer that describes you best. There can only be one answer for each question. Once all the questions are answered, tally each of the letters, V, A and K to find your learning style.

1. If I have to learn how to do something, I learn best when I:

(V) watch someone show me how.

(A) hear someone tell me how.

(K) try to do it myself.

2. When I read, I often find that I:

(V) visualize what I am reading in my mind's eye.

(A) read aloud or hear the words inside my head.

(K) fidget and try to "feel" the content.

3. When asked to give directions, I:

(V) see the actual places in my mind as I say them or prefer to draw them.

(A) have no difficulty in giving them verbally.

(K) have to point or move my body as I give them.

4. If I am unsure how to spell a word, I:

(V) write it in order to determine if it looks right.

(A) spell it out loud in order to determine if it sounds right.

(K) write it in order to determine if it feels right.

5. When I write, I:

(V) am concerned with how neat and well spaced my letters and words appear.

(A) often say the letters and words to myself.

(K) push hard on my pen or pencil and can feel the flow of the words or letters as I form them.

6. If I had to remember a list of items, I would remember it best if I:

(V) wrote them down.

(A) said them over and over to myself.

(K) moved around and used my fingers to name each item.

7. I prefer teachers who:

(V) use the board or overhead projector while they lecture.

(A) talk with a lot of expression.

(K) use hands-on activities.

8. When trying to concentrate, I have a difficult time when:

(V) there is a lot of clutter or movement in the room.

(A) there is a lot of noise in the room.

(K) I have to sit still for any length of time.

9. When solving a problem, I:

(V) write or draw diagrams to see it.

(A) talk myself through it.

(K) use my entire body or move objects to help me think.

10. When given written instructions on how to build something, I:

(V) read them silently and try to visualize how the parts will fit together.

(A) read them out loud and talk to myself as I put the parts together.

(K) try to put the parts together first and read later.

11. To keep occupied while waiting, I:

(V) look around, stare, or read.

(A) talk or listen to others.

(K) walk around, manipulate things with my hands, or move / shak**e my feet as I sit.**

12. If I had to verbally describe something to another person, I would:

(V) be brief because I do not like to talk at length.

(A) go into great detail because I like to talk.

(K) gesture and move around while talking.

13. If someone were verbally describing something to me, I would:

(V) try to visualize what they were saying.

(A) enjoy listening but want to interrupt and talk myself.

(K) become bored if their description got too long and detailed.

14. When trying to recall names, I remember:

(V) faces but forget names.

(A) names but forget faces.

(K) the situation that I met the person other than the person's name or face.

Scoring Instructions: Add the number of responses for each letter and enter the total below. The area with the highest number of responses is your primary style of learning.

Visual V = _____ Auditory A = _____ Kinaesthetic K = _____

Figure E-1 Survey

Note. From *Learning Styles*. Retrieved March 16, 2009, from http://www.georgebrown.ca/saffairs/stusucc/learningstyles.aspx

HOW TO MAKE A JUMPING FROG

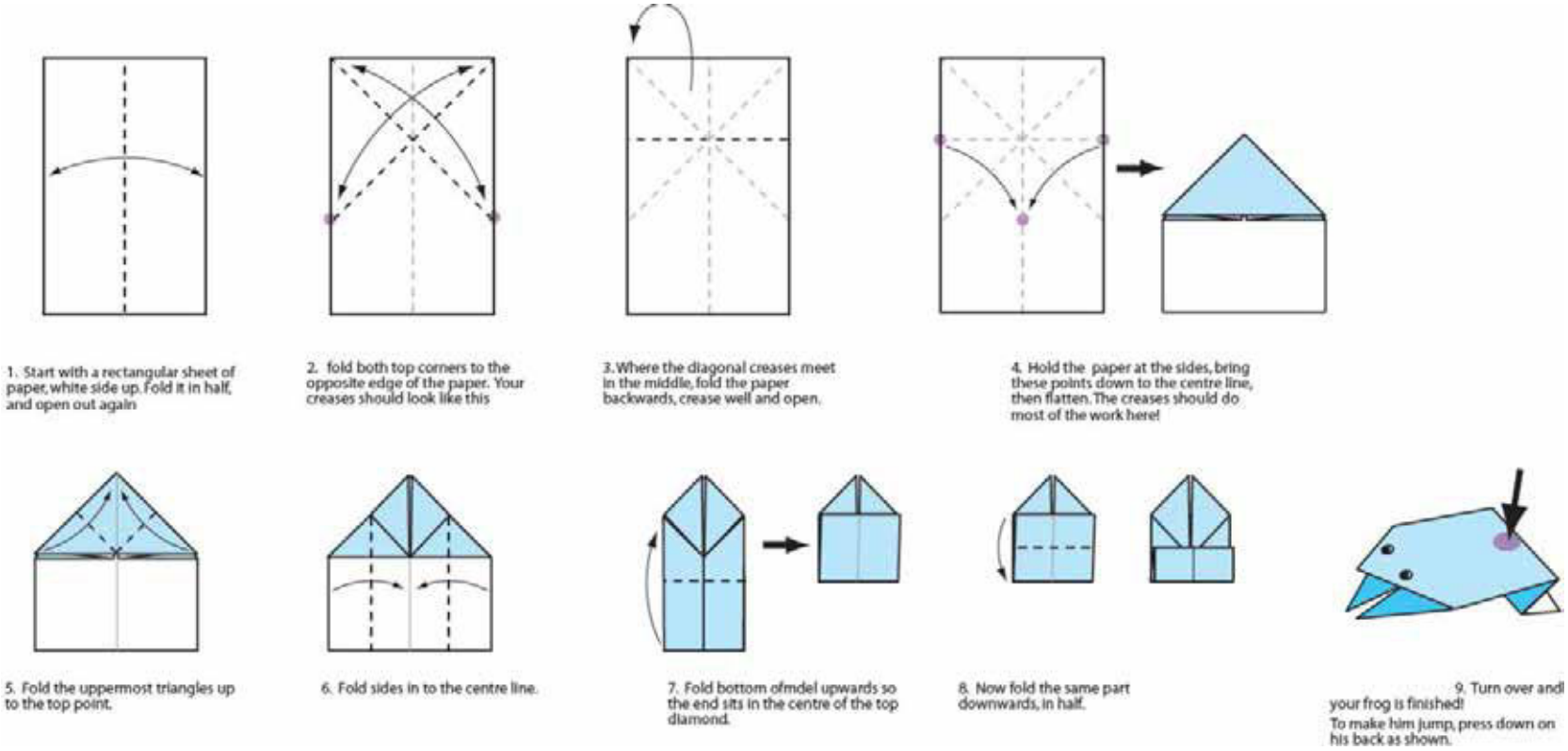

Figure F-1 Jumping Frog

Note. From *Origami-Fun*. Retrieved March 10, 2009, from http://www.origami-fun.com

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HOW TO MAKE A TRIANGULAR BOX

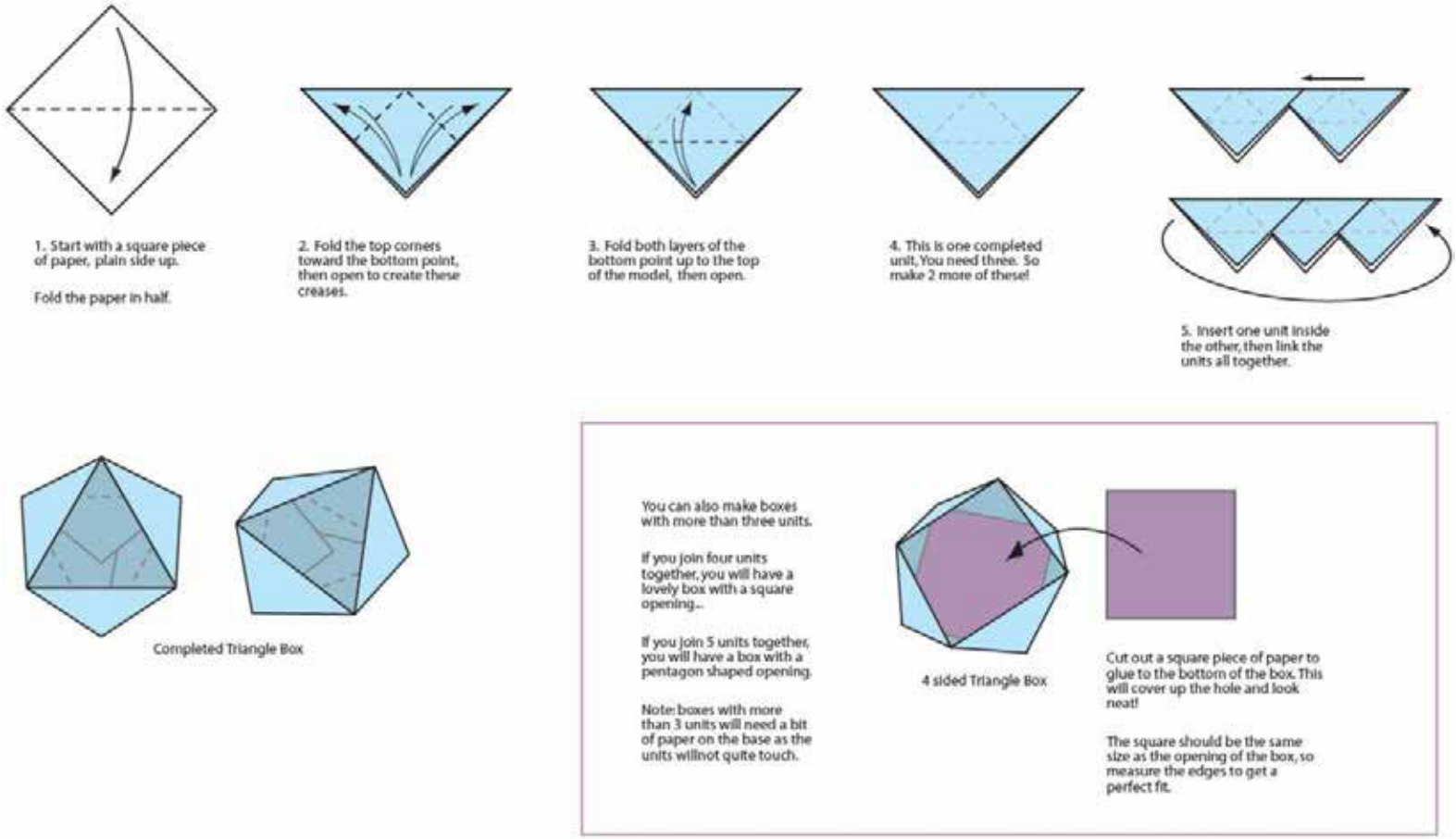

Figure G-1 Triangular Box

Note. From *Origami-Fun*. Retrieved March 10, 2009, from http://www.origami-fun.com

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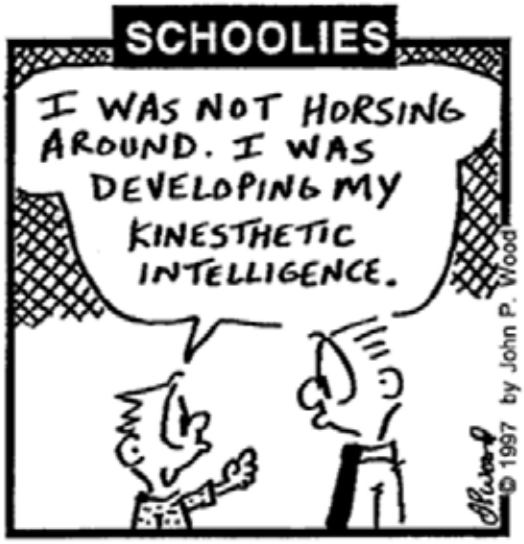

Figure H-1 Kinesthetic Learning

Note. From *Schoolies*, 1997, Copyright 1997 by J. Wood. Retrieved from http//:www.learninglaffs.com

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INSTRUCTOR TIPS FOR LEARNING STYLES

Directions: Match each instructor tip with the correct learning style. Use V for Visual, A for Auditory, and K for Kinaesthetic.

1. ____ Allow cadets to sit where they can see clearly.
2. ____ Allow the cadets to get up and move.
3. ____ Use hands-on activities.
4. ____ Provide movement as part of the lesson.
5. ____ Buddy up to teach each other.
6. ____ Use items that can be handled and moved.
7. ____ Allow the cadets to sit where they can hear clearly.
8. ____ Read aloud written material.
9. ____ Keep visual aids in view long enough to be seen and referred back to.
10. ____ Use presentations, mutuals and speeches.
11. ____ Follow a written agenda and provide written material to be followed.
12. ____ Write out directions.
13. ____ Provide a space where they can read questions aloud to themselves before they write them down.
14. ____ Allow the cadets to do what is asked for, not to describe it.
15. ____ Provide discussion opportunities.
16. ____ Use rhymes, mnemonics and acronyms.
17. ____ Slow down and repeat when giving verbal information.
18. ____ Change pitch, tone and speed for emphasis.
19. ____ Avoid meaningless movement and decorations.
20. ____ Use posters, pictures, models, real items, and people.
21. ____ Have the cadets repeat things back.
22. ____ Use real items in context.
23. ____ Provide a space with few distractions.
24. ____ Allow matching or reorganizing rather than naming.
25. ____ Slow down, repeat and use only necessary words when asking verbal questions.
26. ____ Provide opportunity for written responses.
27. ____ Provide space to move around.
28. ____ Provide opportunity for verbal responses.
29. ____ Allow them to talk to themselves and whisper when they read.

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INSTRUCTOR TIPS FOR LEARNING STYLES ANSWER KEY

Directions: Match each instructor tip with the correct learning style. Use V for Visual, A for Auditory, and K for Kinaesthetic.

1. V Allow cadets to sit where they can see clearly.
2. K Allow the cadets to get up and move.
3. K Use hands-on activities.
4. K Provide movement as part of the lesson.
5. A Buddy up to teach each other.
6. K Use items that can be handled and moved.
7. A Allow the cadets to sit where they can hear clearly.
8. A Read aloud written material.
9. V Keep visual aids in view long enough to be seen and referred back to.
10. A Use presentations, mutuals and speeches.
11. V Follow a written agenda and provide written material to be followed.
12. V Write out directions.
13. A Provide a space where they can read questions aloud to themselves before they write them down.
14. K Allow the cadets to do what is asked for, not to describe it.
15. A Provide discussion opportunities.
16. A Use rhymes, mnemonics and acronyms.
17. V Slow down and repeat when giving verbal information.
18. A Change pitch, tone and speed for emphasis.
19. V Avoid meaningless movement and decorations.
20. V Use posters, pictures, models, real items, and people.
21. A Have the cadets repeat things back.
22. K Use real items in context.
23. V Provide a space with few distractions.
24. K Allow matching or reorganizing rather than naming.
25. V Slow down, repeat and use only necessary words when asking verbal questions.
26. A Provide opportunity for written responses.
27. K Provide space to move around.
28. A Provide opportunity for verbal responses.
29. A Allow them to talk to themselves and whisper when they read.

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ACTIVITIES IN DEVELOPMENTAL PERIODS

Read each statement and determine what developmental period is being described. Draw an arrow to the correct column.

Ages 12–14 DP 1 Experienced-Based	Activity Description	Ages 15–16 DP 2 Developmental
	Clear / simple processes.	
	Provide reasons for the activity.	
	Provide some structure (eg, the instructor chooses the groups but leaves some choices to the group).	
	Closely supervised.	
	Semi-independent and less supervised.	
	Clear goals with some choice in process.	
	Very structured.	
	Lots of play.	
	Trial and error activities.	
	Clear and concrete goals (eg, one goal / one activity).	
	Provide reasons for the activity.	
	Will not require an instant result at the end of the first session. Can stretch the activity over 2–3 lessons.	
	Results oriented.	
	Formal, effective assessment is appropriate. Begin to develop skills in self assessment.	
	Assessment should focus on participation and observation.	
	Short learning sessions.	

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ACTIVITIES IN DEVELOPMENTAL PERIODS ANSWER KEY

Read each statement and determine what developmental period is being described. Draw an arrow to the correct column.

Ages 12–14	Activity Description	Ages 15–16
DP 1 Experienced-Based		**DP 2 Developmental**
←	Clear / simple processes.	
	Provide reasons for the activity.	→
	Provide some structure (eg, the instructor chooses the groups but leaves some choices to the group).	→
←	Closely supervised.	
	Semi-independent and less supervised.	→
	Clear goals with some choice in process.	→
←	Very structured.	
←	Lots of play.	
←	Trial and error activities.	
←	Clear and concrete goals (eg, one goal / one activity).	
	Provide reasons for the activity.	→
	Will not require an instant result at the end of the first session. Can stretch the activity over 2–3 lessons.	→
←	Results oriented.	
	Formal, effective assessment is appropriate. Begin to develop skills in self assessment.	→
←	Assessment should focus on participation and observation.	
←	Short learning sessions.	

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 4

EO M409.04 – EXPLAIN ASSESSMENT

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

PRE-LESSON ASSIGNMENT

Photocopy the Assessment of Learning Plan located at Attachment A for each cadet.

Photocopy the Assessment Instructions located at Attachment B for each cadet.

Photocopy the assessment instruments located at Attachments C, D and E for each cadet.

APPROACH

An interactive lecture was chosen for this lesson as a way to introduce the cadets to assessment types, instructions and instruments, provoke thought and stimulate interest among cadets.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have explained assessment.

IMPORTANCE

It is important for cadets to know the different types of assessment and how to use assessment tools to create a positive learning environment. Varying the method of assessment is one way for instructors to create interest and encourage learning.

Teaching Point 1 **Explain types of assessment.**

Time: 10 min Method: Interactive Lecture

ASSESSMENT OF LEARNING

Assessment of learning is the predominant type of assessment used following instruction / learning. It is a summative type of assessment that is used to report on progress made by cadets, usually by showing the instructor a cadet's relative position compared to other cadets. Assessment of learning usually takes the form of questions and answers compiled in a test or quiz. The questions are from the lesson that was taught and typically performed at the end of an instruction unit.

Tests are used to measure quantity and accuracy of student progress with little or no direction and advice for improvement. This type of testing shows which students are doing well and which are doing poorly. Although these testing techniques are simplistic, they can be a good indication of a cadet's mastery of skills and knowledge. They are not always a good indication of the ideas or concepts covered.

Within the Canadian Cadet Organization (CCO), assessment of learning takes place to determine whether learners have achieved Performance Objectives (PO) or critical Enabling Objectives (EO) (those deemed prerequisites for further training and education) and are used at the end of a phase of instruction. Every opportunity should be given to cadets to be successful in their assessment, even if multiple challenges are required.

ASSESSMENT FOR LEARNING

Assessment for learning is ongoing assessment used during instruction. It is a formative type of assessment and is used to create descriptions of the cadet's knowledge on the subject matter. These descriptions are used to determine if the instructor needs to review information and where the weak areas are in the lesson. This information can also be used to provide feedback to the cadet regarding their strengths and areas for improvement.

Assessment instruments used during assessment for learning include:

- worksheets,
- checklists,
- in-class activities, and
- questions and observations.

In assessment for learning, the instructor is the central character that will use the information obtained to design and develop the next stage of instruction.

Within the CCO, assessment for learning takes place during a phase of instruction and helps cadets and instructors recognize progress or lapses in learning. Through assessment for learning, the instructor can:

- identify when corrective or remedial action is required;
- plan the next steps in instruction;
- provide cadets with feedback so they can improve; and
- reinforce learning to aid the cadet in retaining information.

Assessment for learning may also include opportunities for cadets to practice using Performance Checks (PC) employed in assessment of learning.

A simple comparison of assessment types can be made as follows:

When a cook tastes the soup, that is formative (assessment for) and allows them to adjust spices to change the flavour to improve the taste; when the guests taste the soup, that is summative (assessment of) and allows them to make a judgement of the quality of the soup.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What type of assessment is assessment for learning?

Q2. What does assessment for learning (formative) give the instructor the ability to do?

Q3. Why does assessment of learning (summative) take place?

ANTICIPATED ANSWERS:

A1. Formative.

A2. Identify when corrective or remedial action is required, plan the next steps in instruction, provide cadets with feedback so they can improve, and reinforce learning to aid the cadet in retaining information.

A3. To determine whether learners have achieved POs or critical EOs (those deemed prerequisites for further training and education).

Teaching Point 2 **Describe assessment instructions and instruments.**

Time: 15 min Method: Interactive Lecture

Assessment for learning takes place throughout the learning process and guides the instructor in lesson planning; assessment of learning takes place upon completion of the learning phase. Chapter 3 of the Qualification Standard and Plan (QSP) outlines the assessment of learning plan and the assessment instruments to be used.

All attachments for this lesson are taken from A-CR-CCP-803/PG-001, *Proficiency Level Three Qualification Standard and Plan*, Chapter 3. Details of assessment are located in Chapter 3 of all QSPs.

CADET ASSESSMENT OF LEARNING PLAN

Distribute the Assessment of Learning Plan located at Attachment A to each cadet.

The Assessment of Learning Plan located at Chapter 3, Annex B of the QSP, provides an overall strategy for using assessment activities to determine if the cadet has met the requirements for qualification. The assessment of learning plan will:

1. provide an outline of each assessment of learning activity including its purpose, when it will occur and details the assessment instrument(s) used to support cadet evaluation;

2. identify the learning target(s) associated with the PO and / or EO being assessed, to include:

    a. **Knowledge Mastery.** The facts, concepts and theory a cadet needs to know;

    b. **Reasoning Proficiency.** A cadet uses what they know to solve a problem, make a decision, make a plan, think critically, set goals, or self-assess;

    c. **Skills.** Performance demonstration where the cadet demonstrates their ability to perform a skill. To be assessed, these performances must be demonstrated by the cadet and observed by an assessor;

    d. **Ability to Create Products.** A cadet uses their knowledge, reasoning and skills to create a concrete product; and / or

    e. **Attitudinal / Dispositional Changes.** A cadet's attitude about learning, safety, conduct, etc. Targets in this realm reflect attitude and feeling. They represent important affective goals we hold for a cadet as a by-product of their CP experience, and as such are not generally assessed for the purpose of attaining a qualification.

3. identify the assessment method(s) that best matches PO and / or EO learning targets, to include:

    a. **Selected Response.** A cadet selects the correct or best response from a list provided. Formats include multiple choice, true / false, matching, short answer, and fill-in-the-blank questions. Although short answer and fill-in-the-blank questions do require cadets to generate an answer, they call for a very brief answer that is counted as right or wrong, so these have been included in the selected response category;

    b. **Extended Written Response.** A cadet is required to construct a written answer in response to a question or task rather than select one from a list. An extended written response is one that is at least several sentences in length;

    c. **Performance Assessment.** This assessment method is based on observation and judgment; performance or product is observed and a determination is made as to its quality; and / or

    d. **Personal Communication.** Gathering information about a cadet through personal communication; learning is assessed through interpersonal interaction with the cadet.

ASSESSMENT INSTRUMENTS

Specific assessment instruments are designed to support each assessment activity within the assessment of learning plan. These are meant to standardize assessment activities and cadet evaluation for all cadets attempting the qualification. Assessment instruments are located at the appendices to Chapter 3, Annex B of the QSP.

Distribute the Assessment Instructions located at Attachment B to each cadet.

Assessment instructions are provided to guide the instructor through the steps of the assessment to ensure consistent conduct of all assessments.

Using the Assessment Instructions handout, discuss with the cadets the information located in it, to include:

- preparation,
- conduct of assessment, and
- post-assessment instructions.

Distribute the assessment instruments located at Attachments C, D and E to each cadet. Discuss with the cadets how to use each of these assessment instruments.

Assessment is conducted to ascertain levels of learning. In most cases, these levels are defined in the Assessment Instructions. The most common assessment instruments used in the CCO are rubrics, individual checklists, and group checklists.

Rubric. A scoring tool that lists criteria to be considered for assessment. It is designed to guide the individual assessor's interpretation by providing a description of what should be observed for each level of proficiency and should be as clear and concise as practical.

Checklists. A simple checkbox type of worksheet that shows success in given tasks. Checklists can be designed to assess both individuals or groups.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What does the Assessment of Learning Plan provide?

Q2. What are the three parts of the Assessment Instructions?

Q3. What is a rubric?

ANTICIPATED ANSWERS:

A1. An overall strategy for using assessment activities to determine if the cadet meets the requirements.

A2. Preparation, conduct of assessment and post-assessment instructions.

A3. A scoring tool that lists criteria to be considered for assessment. It is designed to guide the individual assessor's interpretation by providing a description of what should be observed for each level of proficiency and should be as clear and concise as practical.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. Where in the QSP can information on assessment be found?

Q2. When does assessment for learning (formative assessment) take place?

Q3. What is the purpose of the Assessment Instructions?

ANTICIPATED ANSWERS:

A1. In Chapter 3 of the QSP.

A2. Ongoing throughout the lesson.

A3. To guide the instructor through the steps of the assessment to ensure consistent conduct of all assessments.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, 409 PC.

CLOSING STATEMENT

Being familiar with assessment requirements will allow the instructor to be better prepared to meet the requirements of the lesson.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

A3-191 A-CR-CCP-803/PG-001 Director Cadets 3. (2008). *Proficiency level three qualification standard and plan*. Ottawa, ON: Department of National Defence.

C0-376 ISBN 0-7619-4626-8 Earl, L. (2003). *Assessment as learning*. Thousand Oaks, CA: Corwin Press, Inc.

Annex B

Assessment of Learning Plan – Proficiency Level Three

EC / PC	Scope	Purpose	Target	Method	How	When	Resources	Limitations
PO 301 – Recognize the Purpose of Service Groups Within Canada								
Nil.								
PO 302 – Perform Community Service								
Nil.								
PO 303 – Perform the Role of a Team Leader								
303 PC	PO 303	To assess the cadet's ability to perform the role of a team leader.	Reasoning Proficiency and Skills	Performance Assessment and Personal Communication	The cadet is observed performing the role of a team leader. The performance is then discussed with the cadet.	On completion of lessons related to EO M303.07 then ongoing throughout the training year.	Chapter 3, Annex B, Appendix 1 checklist and associated rubric.	Nil.
PO 304 – Update Personal Activity Plan								
Nil.								
PO 305 – Participate in Recreational Sports								
Nil.								
PO 306 – Fire the Cadet Air Rifle During Recreational Marksmanship								
Nil.								
PO 307 – Serve in an Air Cadet Squadron								
Nil.								

EC / PC	Scope	Purpose	Target	Method	How	When	Resources	Limitations
PO 308 – Direct a Squad Prior to a Parade								
308 PC	PO 308	To assess the cadet's ability to prepare a squad for parade.	Skills	Performance Assessment	The cadet is observed as they prepare a squad for parade by: forming up, sizing, dressing, inspecting and calling the roll.	During preparation for squadron opening and closing parades.	Chapter 3, Annex B, Appendix 2 checklist.	Nil
PO 309 – Instruct a Lesson								
309 PC	PO 309	To assess the cadet's ability to instruct a lesson using a written lesson plan, an appropriate method(s) of instruction and an appropriate instructional aid(s).	Product and Reasoning Proficiency	Performance Assessment	The cadet's lesson plan is reviewed and they are observed while instructing a 15-minute lesson.	Ongoing during the conduct of lessons related to EO M309.07	Chapter 3, Annex B, Appendix 3 checklist and rubric	Assistance is denied.
PO 311 – Participate in a Recreational Biathlon Activity								
Nil.								
PO 320 – Participate in Canadian Forces (CF) Familiarization Activities								
Nil.								

EC / PC	Scope	Purpose	Target	Method	How	When	Resources	Limitations
POs 331/336/337 (Aviation Subjects) – Combined Assessment								
M331 M336 M337 PC	PO 331 PO 336 PO 337	To assess the cadets' ability to master knowledge of aviation subjects.	Knowledge Mastery	Selected Response	The cadet will write a performance check.	At or near the end of the training year.	Chapter 3, Annex B, Appendix 4 Written Test.	No assistance will be given.
PO 340 – Identify Aspects of Space Exploration								
Nil.								
PO 360 – Recognize Aspects of Aerodrome Operations								
Nil.								
PO 370 – Recognize Aspects of Aircraft Manufacturing and Maintenance								
Nil.								
PO 390 – Navigate a Route Using a Map and Compass								
M390 PC	PO 390	To assess the cadet's ability to navigate a route using a map and compass.	Skills	Performance Assessment	The cadet is observed as they perform the various skills to navigate a route using a map and a compass	After completion of instruction and during a filed exercise.	Chapter 3, Annex B, Appendix 5 checklist and associated rubric.	No assistance will be given.

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ANNEX B, APPENDIX 1

303 PC

ASSESSMENT INSTRUCTIONS

PREPARATION

PRE-ASSESSMENT INSTRUCTIONS

Review the assessment plan, assessment instructions and 303 PC Assessment Rubric and become familiar with the material prior to conducting the assessment.

There is no time allotted for 303 PC. It is to be administered whenever and wherever Phase Three cadets lead cadets through a leadership assignment.

The cadet shall be given a minimum of one practice leadership assignment which will be assessed using the 303 PC Assessment Rubric. The cadet will reflect and self-assess after the practice leadership assignment using the same rubric. The practice leadership assignment will not be recorded on the cadet's qualification record.

The formal leadership assignment will be given and assessed using the 303 PC Assessment Rubric. The cadet will reflect and self-assess after the leadership assignment using the same rubric. The leadership assignment shall be recorded on the cadet's qualification record.

If the cadet does not achieve the performance standard, the cadet will be given additional leadership assignments until the performance standard is met.

Photocopy the 303 PC Assessment Rubric twice for each leadership assignment given.

PRE-ASSESSMENT ASSIGNMENT

The cadet shall review the 303 PC Assessment Rubric and become familiar with the assessment criteria prior to the leadership assignment.

ASSESSMENT METHOD

Performance assessment and personal communication were chosen as it allows the assessor to observe the cadet's ability to perform the required skill(s) and make a judgement on the quality of performance.

CONDUCT OF ASSESSMENT

PURPOSE

The purpose of this PC is to assess the cadet's ability to lead cadets through a leadership assignment.

RESOURCES

- Two 303 PC Assessment Rubrics, and
- As per the leadership assignment.

ASSESSMENT ACTIVITY LAYOUT

As per the leadership assignment.

ASSESSMENT ACTIVITY INSTRUCTIONS

While observing the cadet leading cadets through a leadership assignment, assess the quality of each criterion by indicating (eg, highlighting, circling, note taking) on the Assessment Rubric, the descriptive statement that best represents this judgement. Criteria for the leading through a leadership assignment are assessed as:

- Incomplete;
- Completed with difficulty;
- Completed without difficulty; or
- Exceeded standard.

Make notes of observations to provide descriptive post-assessment feedback.

1. Communicate to the cadet their leadership assignment either verbally or in writing.
2. Ensure the cadet understands the leadership assignment.
3. Distribute the Assessment Rubric to the cadet for self-assessment purposes.
4. Ensure the cadet understands their self-assessment will not be recorded on their qualification record.
5. Have the cadet conduct the leadership assignment.
6. Evaluate the cadet's leadership ability by observation. Record the result (eg, highlighting, circling, note taking) on the Assessment Rubric for each criterion.

The assessment of leadership abilities is subjective; however, the assessor's responsibility is to be as positive as possible.

7. Have the cadet assess their performance on their Assessment Rubric.

POST ASSESSMENT INSTRUCTIONS

RECORDING ASSESSMENT RESULTS

1. Indicate the overall performance assessment on the Assessment Checklist as:
   a. **Incomplete.** Overall, the cadet has not achieved the performance standard;
   b. **Completed with difficulty.** Overall, the cadet has achieved the performance standard with difficulty;
   c. **Completed without difficulty.** Overall, the cadet has achieved the performance standard without difficulty; or
   d. **Exceeded standard.** Overall, the cadet has exceeded the performance standard.
2. Record notes and observations in the assessor’s feedback section of the Assessment Checklist.

3. Sign and date the Assessment Checklist.

4. Ensure a copy of the Assessment Checklist is attached to the cadet's training file.

5. The overall result will be recorded on the Phase Three Qualification Record located at Chapter 3, Annex C.

PROVIDING ASSESSMENT FEEDBACK

Discuss the cadet's self-assessment on their performance.

Ask the cadet what they felt went right during the leadership assessment, what did not go well and ask the cadet how they would improve their performance if the leadership assignment was given to them again.

Discuss the performance results of each section of the Assessment Rubric with the cadet.

Discuss the overall performance results with the cadet and provide the cadet with a copy of the completed rubric.

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303 PC ASSESSMENT RUBRIC

Cadet's Name: _____ Corps: _____

Date: _____ Division: _____

	Incomplete	Completed With Difficulty	Completed Without Difficulty	Exceeded the Standard
Communicate as a team leader.	Did not communicate with team members.	Communicated with team members occasionally. Team members needed clarification on many occasions.	Communicated with team members on many occasions. Team members needed few clarifications.	Communicated to the team throughout the leadership task. Team members did not need clarification.
Supervise cadets.	Did not supervise cadets.	Only supervised cadets at the beginning and / or end of the leadership assignment.	Supervised throughout the leadership assignment making some corrections when necessary.	Supervised throughout the leadership assignment making corrections as necessary.
Solve problems.	Did not solve the problem(s).		Solved the problem(s).	
Complete the leadership assignment.	Did not complete the leadership assignment.		Completed the leadership assignment.	
Perform self-assessment.	Did not complete the self-assessment.		Completed the self-assessment.	

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308 PC ASSESSMENT CHECKLIST

Cadet's Name: _____ Corps: _____

Date: _____ Division: _____

Analytical Performance Assessment:

Direct a squad prior to a parade	**Incomplete**	**Completed With Difficulty**	**Completed Without Difficulty**
Fall in a squad.			
Call the roll.			
Size in a single rank and reform in threes (twos).			
Dress a squad.			
Inspect a squad.			
Hand over a squad.			

Assessor's Feedback

	PO 308 Overall Assessment			
Check One	**Incomplete**	**Completed With Difficulty**	**Completed Without Difficulty**	**Exceeded Standard**
Overall Performance	The cadet has not achieved the performance standard by not completing at least one of the required skills.	The cadet has achieved the performance standard by completing one or more of the required objectives with difficulty.	The cadet has achieved the performance standard by completing all objectives without difficulty.	N/A

Assessor's Name:	**Position:**
Assessor's Signature:	**Date:**

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390 PC ASSESSMENT CHECKLIST

Cadet's Name: _____

Other Group Member: _____

Assessor: _____

Performance Assessment:

Skill Group	Task		Assessment	
			Incomplete	Completed
Grid References (GRs)	Determine six-figure GR for each of the three points marked on the map.	#1		
		#2		
		#3		
	Plot each of the three 6-figure GR, from the worksheet on the map.	#1		
		#2		
		#3		
Determining Distance and Pacing	Determine distance for each of the six legs (within 50 m).	#1		
		#2		
		#3		
		#4		
		#5		
		#6		
	Calculate distance into paces for each of the six legs.	#1		
		#2		
		#3		
		#4		
		#5		
		#6		
	Use a method to keep track of pace count for each of the three legs.	#1		
		#2		
		#3		
	Bypass obstacles using pacing techniques (observed for each of the three legs).	#1		
		#2		
		#3		
	Find marker within 10 percent of calculated pace count for each of the three legs.	#1		
		#2		
		#3		

Skill Group	Task		Incomplete	Completed
Bearings	Check magnetic declination setting on the compass.			
	Determine bearing for each of the six legs from a map (within two degrees).	#1		
		#2		
		#3		
		#4		
		#5		
		#6		
	Set compass (within two degrees) of bearing for each of the three legs.	#1		
		#2		
		#3		
	Determine direction of travel (within five degrees) for each of the three legs using a compass.	#1		
		#2		
		#3		
	Determine a steering point for each of the three legs.	#1		
		#2		
		#3		
	Re-check, for each of the three legs (minimum once each leg), direction of travel using a compass.	#1		
		#2		
		#3		
	Re-check, for each of the three legs (minimum once each leg), direction of travel using the determined steering point.	#1		
		#2		
		#3		
	Find marker within a 20-m radius for each of the three legs.	#1		
		#2		
		#3		

Incomplete	The task was not attempted or not completed despite being provided assistance.
Completed	The task was completed without difficulty or with difficulty / assistance.

Overall Performance Assessment:	**PO Assessment**	
PO 390 PC	**Incomplete**	**Completed**
Participate in Ground Navigation.		

Incomplete	If over 40 percent (over 21) of the tasks are assessed as incomplete.
Completed	If 60 percent and over (31 and over) of the tasks are assessed as completed.

Assessor's Feedback:

Assessor's Signature: _____ Date: _____

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SAMPLE ASSESSMENT ACTIVITY

Sample Map

Figure B5-1 Assessment Activity Map

Note. From *Bancroft 31 F/4*, Canada Centre for Mapping, 1996, Ottawa, ON: Natural Resources Canada. Copyright 1996 by Her Majesty the Queen in Right of Canada.

All points are located in the lower left-hand corner. To clearly identify the designated points and terrain features, Figure B5-1 is best viewed in colour.

The cadets will be given a compass, map, worksheet and access to a calculator. The map has been marked with the start point, "S" and the three other points, "1", "3", and "6", for which to determine six-figure GRs. The other three points, for legs two, four and five, will be marked on the map by the cadet from the six-figure GRs on the worksheet. All seven points have a descriptive word or phrase to help identify it. The cadets will complete the worksheet then move on to the course to complete three legs each. When the course has been completed, the cadets will do a self-assessment with their assessor and receive a copy of their Assessment Checklist by the next parade night.

A sample and completed worksheet are shown as examples for this sample assessment activity. The blank worksheet may be used as a template.

Cadet Worksheet (sample)

Name: _____ Personal Pace: _____

#	GR	Distance		Bearing	Description
S	728883	m	paces	X	most southerly cabin on Jeffrey Lake
1					cabin by vehicle track fork
2	722882				shore of Pipe Lake near the "L" of lake
3					most southerly cabin on Pipe Lake
4	720878				shore of Carfrae Lake near the "e" of lake
5	723873				hill south of Carfrae Lake
6					vehicle track crossing creek south of cabin

Magnetic Declination: 11° west declination

Safety Bearing: 120°
Will lead to either a gravel road or a vehicle trail; wait at the side of the road / trail for the safety vehicle.

Calculations:

Cadet Worksheet (completed sample):

Name: F/Cpl Bloggins Personal Pace: 140

#	GR	Distance		Bearing	Description
S	728883	m	paces	X	most southerly cabin on Jeffrey Lake
1	727881	200	280	199°	cabin by vehicle track fork
2	722882	500	700	282°	shore of Pipe Lake near the "L" of lake
3	720881	200	280	230°	most southerly cabin on Pipe Lake
4	720878	450	630	180°	shore of Carfrae Lake near the "e" of lake
5	723873	450	630	154°	hill south of Carfrae Lake
6	728878	800	1120	44°	vehicle track crossing creek

Magnetic Declination: 11° west declination

Safety Bearing: 120°
Will lead to either a gravel road or a vehicle trail; wait at the side of the road / trail for the safety vehicle.

Calculations:

Cadet Worksheet

Name: _____ Personal Pace: _____

#	GR	Distance		Bearing	Description
S		m	paces	X	
1					
2					
3					
4					
5					
6					

Magnetic Declination:

Safety Bearing:

Calculations:

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 5

EO M409.05 – INSTRUCT A 30-MINUTE LESSON

Total Time:	90 min

THERE IS NO INSTRUCTIONAL GUIDE PROVIDED FOR THIS EO

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 6

EO C409.01 – PLAN A LESSON

Total Time:	60 min

THERE IS NO INSTRUCTIONAL GUIDE PROVIDED FOR THIS EO

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 7

EO C409.02 – INSTRUCT A 30-MINUTE LESSON

Total Time:	90 min

THERE IS NO INSTRUCTIONAL GUIDE PROVIDED FOR THIS EO

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 8

EO C409.03 – ACT AS AN ASSISTANT INSTRUCTOR

Total Time: 90 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

The course officer shall communicate with the training officer to ensure that cadets are paired with a Proficiency Level One, Two or Three instructor during a regular training session. As part of the training session, the instructor and cadet should be scheduled for two periods of instruction. The time the cadet is not instructing may be used for lesson preparation, briefing, debriefing, securing training aids, etc.

A number of factors may exist based on the size of the squadrons that will not allow for all Proficiency Level Four cadets to be scheduled for this EO at the same time. In this circumstance, special consideration should be given to minimize the cadet's absence from other areas of training. For example, scheduling half of the cadets for this EO while the other half is scheduled for EO C440.02 (Launch a Small Model Rocket) and reversing the schedule for the following training session.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

OJT was chosen for this lesson as it allows the cadets to assist instructing a lesson in a safe and controlled environment. The OJT experience provides the cadets a practical application of learned skills in a realistic setting. The cadets reflect on the experience and receives feedback on the performance, which helps to shape future experiences. The cadets develop a sense of responsibility from the OJT aiding their development as a leader.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have acted as an assistant instructor.

IMPORTANCE

It is important for cadets to act as an assistant instructor as it gives them the opportunity to practice, observe and assist in performing the duties of an instructor in a safe and controlled environment during a regular training session.

Teaching Point 1 **Have the cadets act as assistant instructors in on-the-job training (OJT).**

Time: 90 min Method: On-The-Job Training

PURPOSE

The purpose of having the cadets act as assistant instructors is to provide them with an authentic experience that allows them to observe and assist in performing the duties of an instructor during a regular training session. This activity is intended to be experiential in nature, providing the cadets the opportunity to work with experienced instructors, with assessment for learning being the focus rather than assessment of learning. When pairing the cadets with an instructor, consideration must be given to such things as the background, specialty and confidence of each cadet while in front of a class. The proper pairing of cadets with an instructor will help to ensure the OJT experience satisfies the stated purpose.

GENERAL INSTRUCTIONS

For one training session the cadets shall be paired with an instructor who is instructing a group of cadets participating in Proficiency Level One, Two or Three training.

The instructor is responsible for the following:

1. Ensure the cadet is briefed on their responsibilities and tasks prior to the commencement of the lesson.
2. Ensure the cadet is provided opportunities to perform some or all tasks normally completed by the instructor, such as:
   a. **Preparing training aids as required.** The cadet may be asked to gather and prepare training aids.

The focus of this EO should be the development of instructional skills and increasing experience and confidence while in front of a class. The instructor should develop training aids for the lesson. Give the cadet tasks such as setting up presentation aids and organizing training aids, eg, signing out an air rifle for a marksmanship lesson.

   b. **Helping instruct the lesson.** The cadet may be asked to provide a demonstration, assist with the conduct of an in-class activity or instruct a TP of a lesson.
   c. **Supervising the cadets.** The cadet may be asked to assist with the supervision of the cadets.
   d. **Providing assistance as required.** The cadet may be asked to provide assistance or assist with skill development by coaching or demonstrating a skill being taught.
   e. **Securing training aids as required.** Once the lesson is complete, the cadet may be asked to secure and return training aids to storage.
3. If necessary, debrief the (Proficiency Level One, Proficiency Level Two or Proficiency Level Three) cadets, correcting any content errors or omissions made by the cadet.
4. Debrief the cadet upon completion of the training session and provide them the opportunity to ask questions and seek additional feedback.

CONFIRMATION OF TEACHING POINT 1

The cadets' acting as an assistant instructor will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' acting as an assistant instructor will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Acting as an assistant instructor allows for the development of skills necessary to become a competent instructor by observing, practicing instruction and receiving feedback from an experienced instructor in a safe and controlled environment during a regular training session.

INSTRUCTOR NOTES / REMARKS

Prior to this EO, the course officer shall communicate with the training officer to ensure that cadets are paired with a Proficiency Level One, Two or Three instructor for a regular training session.

A number of factors may exist based on the size of the squadron that will not allow for all Proficiency Level Four cadets to be scheduled for this EO at the same time. In this circumstance, special consideration should be given to minimize the cadet’s absence from other areas of training. For example, scheduling half of the cadets for this EO while the other half is scheduled for EO C440.02 (Launch a Small Model Rocket) and reversing the schedule for the following training session.

During this EO the instructor shall:

1. brief the cadet prior to commencing the lesson;
2. assign the cadet tasks, to include:
    a. preparing training aids as required;
    b. helping instruct the lesson;
    c. supervising the cadets;
    d. providing assistance as required; and
    e. securing training aids as required;
3. monitor the cadet; and
4. debrief the cadet at the end of the lesson.

REFERENCES

Nil.

COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 9

EO C409.04 – PARTICIPATE IN A CREATIVE LESSON-PLANNING WORKSHOP

Total Time:	90 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-604/PG-001, *Phase Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy Attachments A–C.

Photocopy and three-hole punch the handouts located at Attachments E–G, J and M for each cadet.

Photocopy Attachment K for each group.

Photocopy and cut out the Benefits of Creative Lessons Strips located at Attachment I for each group.

Photocopy a sample lesson plan (from Phase One) for each group.

Prepare a piece of flip chart paper by writing the goals of the workshop:

1. define creativity;
2. identify the benefits of a creative lesson;
3. explain the creative process; and
4. incorporate creativity in the lesson-planning process.

Select music to play in the background for the entire workshop.

PRE-LESSON ASSIGNMENT

Ensure the cadets bring the binder provided in EO M409.01 (Identify Methods of Instruction).

APPROACH

An in-class activity was chosen for this lesson as it is an interactive way to provoke thought and stimulate interest in the creative process and how to incorporate creativity into the lesson-planning process.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have participated in a creative lesson-planning workshop to define creativity, identify the benefits of creative lessons, explain the creative process and learn how to incorporate creative elements into lesson plans.

IMPORTANCE

It is important for cadets to incorporate creative elements into their lesson plans to make their lessons more interesting, enjoyable and engaging for the cadets.

Teaching Point 1 **Conduct an activity where the cadets will define creativity.**

Time: 15 min Method: In-Class Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to have the cadets define creativity.

RESOURCES

- Mixer worksheet located at Attachment A,
- Pigture This... worksheet located at Attachment B,
- Cliche Stretching worksheet located at Attachment C,
- Mixer Answer Key located at Attachment D,
- Flip chart paper,
- Markers, and
- Stereo.

ACTIVITY LAYOUT

1. Set up three workstations.
2. Label the workstations as A, B, and C and place flip chart paper and the corresponding attachments at each station.
3. Ensure the lesson location:
   a. is physically safe;
   b. allows for manipulation of the physical setting such as lighting, temperature and colour to make it more conducive to learning;
   c. is large enough to accommodate small group and whole group activities; and
   d. allows for the incorporation of movement into the lesson.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into equal groups at each station.

Display the chart paper illustrating the worksheet goals.

2. Introduce the goals of the workshop. Read the goals of the workshop together.
3. Instruct the cadets to work in their groups brainstorming ideas about creativity and write their responses on flip chart paper.

4. Instruct the cadets to follow the directions at their station to complete the activity.

Play music in the classroom while the cadets are completing individual and group work.

5. Provide the cadets with two minutes to present an example of their activity and to explain how their activity was creative. Encourage the cadets to use a visual representation of their activity on flip chart paper.

6. Explain to cadets that:

   a. thinking creatively does not always make sense; and

   b. sometimes the brain must think in different ways to find the answer.

7. Present the cadets with the following problem and answer:

   a. If you throw a ball as hard as you can, how does it come back to you?

   b. It doesn't hit anything, no one catches it, and no one else throws it back.

   c. Answer: If you throw the ball up in the air.

8. Provide the cadets with the following definition of creativity:

   a. Creativity is the combining of elements in a new way.

   b. A new idea or product is often a combination of unlike elements previously thought to be completely unrelated.

There are two types of creativity:

- **Technical.** People create new theories, technologies or ideas; and
- **Artistic.** Involves unique methods of self-expression.

Creative people have three qualities:

- an **ability** to imagine relationships between unlike items,
- a **playful attitude** towards new ideas, and
- a **willingness** to work at changing and improving ideas and solutions.

9. Compare the definition with the ideas that the cadets brainstormed on their flip chart paper.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the activity will serve as the confirmation of this TP.

Teaching Point 2 **Have the cadets participate in activities that celebrate and encourage creativity.**

Time: 10 min Method: In-Class Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to have the cadets participate in activities that celebrate and encourage creativity.

RESOURCES

- Celebrate Success handout located at Attachment E (one per cadet),
- Flip chart paper, and
- Markers.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Explain to the cadets that upon hearing the attention signal Two Snaps and a Clap, they will:
   a. repeat the signal immediately by snapping fingers on both hands twice and clapping once;
   b. stop, look at the instructor and wait for an announcement; and
   c. carry on when told to do so.
2. Have the cadets practice the two snaps and a clap.
3. Distribute the Celebrate Success handout located at Attachment E to each cadet.
4. Read Attachment E together.

STIMULATE THE BRAIN TO THINK CREATIVELY

The right side of the brain is the creative side and the left side of the brain is the mathematical side. One side of the brain usually dominates the other with scientific people having a more dominant left side and artistic people having a more dominant right side.

Creativity can be improved by having both sides of the brain switched on and functioning. The left side of the brain controls the right side of the body and the right side of the brain controls the left side of the body. Physical activity increases oxygen flow to the brain and helps it function better.

5. Divide the cadets into four groups to represent each cheer.
6. Provide the cadets two minutes to practice each cheer.

7. Provide each group one minute each to demonstrate each cheer to the class and have them participate in their cheer after each demonstration.

8. Debrief the cadets by emphasizing the importance for motivation and physical activity in lessons.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 2

The cadets' participation in the activity will serve as the confirmation of this TP.

Teaching Point 3 **Conduct an activity where the cadets will identify the benefits of a creative lesson.**

Time: 15 min Method: In-Class Activity

Present the following information to the cadets prior to conducting the activity.

The preparation of a well-developed lesson:

- provides structure and organization;
- guides the instructor through each stage of the lesson; and
- ensures that all essential information is delivered.

A well-developed lesson does not ensure the cadet is interested and engaged in the learning process. Well-planned lessons that creatively challenge and involve the cadets in a variety of activities engage the cadets in the learning process and ensure that learning outcomes are achieved.

Ask the cadets to think about a time when they were bored during a lesson and a time when they were interested during a lesson. Have them think about the two experiences as they take part in the brainstorming activity.

ACTIVITY

Time: 10 min

OBJECTIVE

The objective of this activity is to have the cadets identify the benefits of a creative lesson.

RESOURCES

- The Benefits of Creative Lessons handout located at Attachment F
- The Benefits of Creative Lessons Worksheet located at Attachment G,

- The Benefits of Creative Lessons Answer Key located at Attachment H,
- The Benefits of Creative Lessons Phrase Strips located at Attachment I (one set per group),
- Flip chart paper,
- Markers,
- Pencils / pens, and
- Tape.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into groups of three or four.
2. Distribute the Benefits of Creative Lessons handout located at Attachment F to each cadet and review the handout together.
3. Distribute the Benefits of Creative Lessons worksheet located at Attachment G to each cadet.
4. Give the cadets five minutes to work together to complete the worksheet.
5. After five minutes review the answers using the Benefits of Creative Lessons Answer Key located at Attachment H.
6. Distribute the Strips located at Attachment I, flip chart paper and tape to each group.
7. Have each group divide their sheet of flip chart paper into two columns:
   a. uncreative lesson, and
   b. creative lesson.
8. Have each group place each strip in the appropriate column.
9. Review the cadets' posters and debrief the cadets.

All strips are located under the creative lesson column.

Many instructors do not engage cadets because they do not use enough creativity in their teaching. Some aspects of the cadet program are personally interesting to the cadets which helps compensate for this. Some lessons however, are not personally interesting to the cadets and depend more heavily on the instructors' creative ability.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 3

The cadets' participation in the activity will serve as the confirmation of this TP.

Teaching Point 4 **Conduct an activity where the cadets will identify the stages of the creative process.**

Time: 20 min Method: In-Class Activity

Present the following information to the cadets prior to conducting the activity.

THE CREATIVE PROCESS

A lesson plan is an organized outline for a single period of instruction. It is a necessary guide for instructors because it tells them:

- what to do,
- in what order to do it, and
- what method(s) to use in teaching the material.

Each time an instructor is faced with the challenge of planning a creative lesson they can apply the creative thinking process as outlined below.

ACTIVITY

Time: 15 min

OBJECTIVE

The objective of this activity is to have the cadets participate in the creative process.

RESOURCES

- The Creative Process handout located at Attachment J (one per cadet),
- Forced Analogy worksheet located at Attachment K (one per group),
- Forced Analogy Guide located at Attachment L,
- Empty match box (one per group), and
- HB # 2 pencil (one per group).

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Distribute the Creative Process handout located at Attachment J to each cadet.
2. Review the process with the cadets.
3. Distribute an empty matchbox and the Forced Analogy worksheet to each group.
4. Provide five minutes for the groups to compare the matchbox to their local squadron. Guide the groups through this step by offering assistance as required. Encourage them to be creative in their comparison.

Circulate around the room to ensure that the cadets are processing the information. Use Attachment L as a guide to cadets experimenting difficulty.

5. Have the cadets copy their responses in the forced analogy blank template for the matchbox activity.

If groups finish early, they can continue with the second analogy.

a. Distribute a HB # 2 pencil to each group.

b. Have the cadets use forced analogy to compare parts of the pencil to the Canadian Cadet Organizations (CCO).

c. Have the cadets write their responses on the Forced Analogy worksheet.

6. Have each group assign one of its members to share their chart with the whole group.
7. Have the cadets work in their groups and alternately ask the questions from the Forced Analogy worksheet. Allow them to refer to The Creative Process handout located at Attachment J to help answer the questions.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 4

The cadets' participation in the activity will serve as the confirmation of this TP.

Teaching Point 5 **Conduct an activity where the cadets will incorporate creativity into the lesson-planning process.**

Time: 20 min Method: In-Class Activity

Present the following information to the cadets prior to conducting the activity.

INCORPORATE CREATIVITY INTO A LESSON PLAN

Instructors are constantly challenged to plan lessons that engage cadets in the learning process. Often the only difference between creative and uncreative instructors is self-perception. Creative instructors see themselves as creative and have the confidence to attempt new things. Uncreative instructors do not think about creativity and do not give themselves the opportunity to create anything new.

The first step towards becoming more creative is to relax. It is far more difficult to be creative when the body is tired or stressed. Creativity is found in the subconscious mind which is more accessible in a relaxed state.

To be creative during lesson planning instructors set aside time to examine if there is a better way of instructing a previously taught lesson or to play around with different ways of instructing a new lesson. This process should become a habitual part of the instructor's thinking.

Creative lessons are filled with physical and mental activities that involve all the cadets. The instructor should ensure that the cadets always feel emotionally safe in the learning environment and can take part in all learning activities without fear of being embarrassed, put down or ridiculed. Instructors can do this by:

- showing a positive attitude;
- showing interest in the lesson topic;
- treating cadets respectfully and demanding that cadets treat their peers respectfully;
- challenging cadets with fun activities that are not too easy or too difficult;
- rewarding effort as well as results;
- appealing to different learning styles;
- providing specific feedback;
- encouraging the cadets;
- communicating clear expectations and routines; and
- providing processing time.

ACTIVITY

Time: 15 min

OBJECTIVE

The objective of this activity is to have the cadets incorporate creative elements into the lesson-planning process.

RESOURCES

- Ways to Incorporate Creativity handout located at Attachment M, and
- Sample lesson plan (one per group).

The sample lesson plan can be any lesson plan that has been developed for Phase One training. A sample lesson plan should be developed if none are available.

As an alternative, cadets may use the lesson plan they developed for EO M409.05 (Instruct a 30-Minute Lesson).

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Distribute the Ways to Incorporate Creativity handout located at Attachment M and review as a class.
2. Distribute the sample lesson plan to each group.
3. Allow each group 10 minutes to adapt a lesson plan by incorporating some of the creative elements at appropriate places throughout the lesson.
4. Circulate around the room providing assistance as required.
5. Give each group two minutes to present their ideas for their lessons to the class.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 5

The cadets' participation in the activity will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' participation in the lesson-planning activity will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Lessons that creatively challenge and involve the cadets in a variety of activities engages them in the learning process and ensure that learning outcomes are achieved.

INSTRUCTOR NOTES / REMARKS

This EO should be scheduled as one training session.

This EO shall be conducted after EO M409.05 (Instruct a 30-Minute Lesson).

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MIXER

Proctor and Gamble very creatively combined Pringles potato chips and printing to produce Pringles Prints Potato Chips. Words and images are printed on one side of individual crisps in blue or red. (http://www.junkfoodnews.net/PringlesPrints.htm)

Combine the two elements to make a new phrase / word. The first one is done for you.

A TROLLEY AND A SUITCASE TO GET

luggage on wheels

AN IGLOO AND A HOTEL TO GET AN

_____

A PHOTOCOPIER AND A TELEPHONE TO GET A

_____

A BELL AND A CLOCK TO GET AN

_____

A SURF BOARD AND A SAIL BOAT TO GET

_____

FRENCH FRIES AND CHEESE TO GET

_____

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PIGTURE THIS...

Look at each picture and discuss how the pictures are creative.

PIGTURES

FROSTED FLAKES

DON'T SWEATER
THE SMALL STUFF!

MICESPACE

TEE TIME

UNICORN

**If you can think it,
you've just created it,
even if you can't
hold it in your hand."**

— Chris Dunmire

Figure B-1 Creative Pictures

Note. From *Creativity Portal: Nit Wits*, by C. Dunmire, 2007, Copyright (2007) by Chris Dunmire. Retrieved April 23, 2009, from http://www.creativity-portal.com/becreative/activities

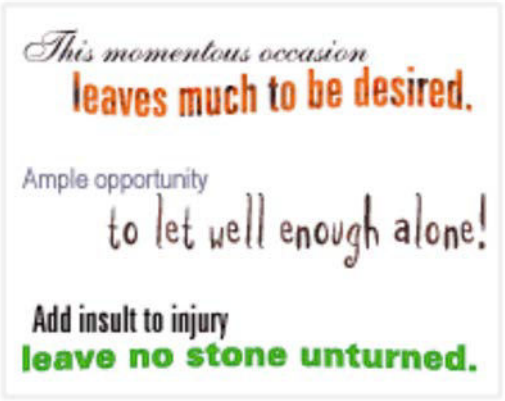
Creativity / Writing Prompt:

List five ways the little gloved one can have its reflection, seeing all of his fingers upright. Tap into that imagination of yours and take it away!

CLICHE STRECTCHING

cliche *n* : a trite phrase or expression : trite *adj* : used so commonly that the novelty has worn off — *Merriam-Webster Dictionary*

This creativity exercise forces your brain to buzz. Skim through the list provided and identify the phrases that you find interesting. Then combine two or three cliches to form new coherent or funny phrases. Read the examples below for ideas.



a bad scene
add insult to injury
agree to disagree
all things considered
all too soon
along these lines
ample opportunity
armed to the teeth
as a matter of fact
at a loss for words
at one fell swoop
avoid it like the plague
awaiting further orders

back at the ranch
back to the drawing board
bated breath
beginning of the end
before you know it
benefit of the doubt
best-laid plans
better late than never
better left unsaid
beyond the shadow of a doubt
bite the bullet
bitter end
bone of contention
bottom line
budding genius

leave no stone unturned
leaves much to be desired
leave up in the air
lend a helping hand
let well enough alone
line of least resistance
little woman
lit up like a Christmas tree
live and let live
lock, stock, and barrel
long arm of the law
look before you leap

marked contrast
matter of life and death
mecca for travelers
method to his madness
milk of human kindness
miraculous escape
moment of truth
momentous occasion
monumental traffic jam
moot point
more than meets the eye
more the merrier
motley crew

narrow escape
nearest and dearest

burning question
busy as a bee
by leaps and bounds
by the same token

calm before the storm
call of the wild
casual encounter
chain reaction
charged with emotion
checkered past
cherished belief
circumstances beyond my control
clear as crystal
come full circle
contents noted
cool as a cucumber
curiously enough
cut a long story short
cut down in his prime

days are numbered
dead as a doornail
deafening crash
depths of despair
diamond in the rough
dig in your heels
do not hesitate to
drastic action
due consideration

each and every
easier said than done
eat, drink, and be merry
eminently successful
engage in conversation
epic struggle
even tenor
exception that proves the rule
existing conditions
express one's appreciation

fall on bad times
fall on deaf ears
far and wide
far be it from me
fateful day
fate worse than death
feel free to
feel vulnerable
festive occasion
few and far between

needs no introduction
never a dull moment
never before in the history of
nipped in the bud
no sooner said than done

one and the same
ongoing dialogue
on more than one occasion
open secret
order out of chaos
other things being equal
outer directed
overwhelming odds
own worst enemy

pales in comparison
paralyzed with fright
paramount importance
pay the piper
peer group
pet peeve
pick and choose
pie in the sky
pinpoint the cause
pipe dream
place in the sun
play hardball
play it by ear
poor but honest
powder keg
powers that be
pros and cons
proud heritage
proud possessor
pull one's weight

rack and ruin
ravishing beauty
red-letter day
regrettable incident
reigns supreme
reliable source
remedy the situation
right on
ripe old age
round of applause

sadder but wiser
saw the light of day
scathing sarcasm
sea of faces

final analysis
finishing touches
fit as a fiddle
food for thought
fools rush in
foregone conclusion
foul play
from the sublime to the ridiculous

generation gap
give the green light to
go down the drain
goes without saying
good team player
grave concern
green with envy
grim reaper
grind to a halt

hands across the sea
happy pair
hastily summoned
have the privilege
heartfelt thanks
heart of the matter
heart's desire
heated argument
heave a sigh of relief
herculean efforts
hook, line, and sinker
hook or crook
hope for the future
hot pursuit
hunker down

ignorance is bliss
ill-fated
immeasurably superior
in close proximity
infinite capacity
innocent bystander
in no uncertain terms
in our midst
in reference to
in short supply
in the limelight
in the nick of time
in the same boat with
in the twinkling of an eye
in this day and age
into full swing
irony of fate

seat of learning
second to none
select few
selling like hotcakes
shattering effect
shift into high gear
shot in the arm
sigh of relief
silence broken only by
silhouetted against the sky
simple life
skeleton in the closet
snug as a bug in the rug
social amenities
spectacular event
spirited debate
stick out like a sore thumb
stick to one's guns
straight and narrow path
structure one's day
such is life
superhuman effort
supreme sacrifice
sweat of his brow
sweeping changes
sweet sixteen

take the bull by the horns
telling effect
terror stricken
thanking you in advance
there's the rub
this day and age
those present
throw a monkey wrench
throw a party
throw caution to the wind
tie that binds
time of one's life
tongue in cheek
too funny for words
too numerous to mention
tough it out
tower of strength
trials and tribulations
trust implicitly

uncharted seas
unprecedented situation
untimely end
untiring efforts

irreplaceable loss
it dawned on me

keep options open

labor of love
lashed out at
last analysis
last but not least
last-ditch effort
leaps and bounds

vale of tears
vanish into thin air

watery grave
wax eloquent/poetic
weaker sex
wear and tear
whirlwind tour
wide open spaces
words fail to express
word to the wise
wrought havoc

Figure C-1 Brain Bender

Note. From *Creative Slush* by C. Dunmire, 2009, Copyright 2005–2009 by Chris Dunmire. Retrieved April 23, 2009, from http://chrisdunmire.com/fun/mixedcliche.shtml

MIXER ANSWER KEY

Proctor and Gamble very creatively combined Pringles potato chips and printing to produce Pringles Prints Potato Chips. Words and images are printed on one side of individual crisps in blue or red. (http://www.junkfoodnews.net/PringlesPrints.htm)

Combine the two elements to make a new word. The first one is done for you.

A TROLLEY AND A SUITCASE TO GET

luggage on wheels

AN IGLOO AND A HOTEL TO GET AN

ice hotel

A PHOTOCOPIER AND A TELEPHONE TO GET A

fax machine

A BELL AND A CLOCK TO GET AN

alarm clock

A SURF BOARD AND A SAIL BOAT TO GET

wind surfing

FRENCH FRIES AND CHEESE TO GET

poutine

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CELEBRATE SUCCESS

BRAIN KISS

1. Kiss the fingers on your open right hand.
2. Transfer the kiss to your brains by tapping your foreheads with the kissed hand.
3. Finish the kiss with flair by throwing the kissed hand in the air.

TRUCK DRIVER

1. Put your hands on the steering wheel of your pretend big rig.
2. Reach your left hand up and pull the cord of your air horns.
3. Let out two throaty honking roars, "honk, honk!"
4. Reach up with your right hand for your walkie talkie and speak into it, saying, "Chhhsshhh. Good job, good buddy. Chhhsshhh."

CHEESE GRATER

1. Hold an imaginary block of cheese in one hand and an imaginary grater in the other.
2. Slide the cheese against the graters five times and say, "Grate, grate, grate, grate, grate job!"

FIREWORKS

1. Push your palms together in front of your chests.
2. Raise your palms above your head, imitating a firework shooting into the sky, complete with a "whooooooosh" sound.
3. When the firework reaches its highest point of ascent, clap your hands above your head, snap your fingers, and wiggle your facedown fingers as you slowly lower your hands.

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THE BENEFITS OF CREATIVE LESSONS

Prevent Disruptions

Many times cadets misbehave during a lesson because of boredom. When they are bored, their minds begin to wander and they start to wonder " what would happen if I …" The cadets' attention is not focused on the lesson and soon little disruptions occur which often become big disruptions. Creative lessons focus the cadets' attention on the instructional activity and they are too busy to become disruptive.

Engage Cadets

When the instructor develops a fresh approach to a lesson, the cadets become interested in the lesson and motivated to pay attention. If the instructor conducts activities that physically and mentally involves the cadets, a transfer of power from the instructor to the cadets occurs. The cadets assume more responsibility for their own learning and the instructor becomes a guide.

Involve More Cadets

In a traditional lesson, the instructor talks more than two thirds of the time, mostly giving instructions and answering questions. Less than one third of the time is spent on individual interactions with cadets in the form of praise, encouragement, specific feedback and guiding cadets as they work with others. In creative lessons the instructor communicates less to the whole group and more with individual cadets or small groups of cadets. By using techniques, such as those described at Attachment M, the instructor can involve at least half of the cadets in an interaction at one time and all of the cadets before the lesson is over.

Bridge the Gap Between Watching (Passive) and Doing (Active)

Learning is an active social process and occurs best when the cadets participate with their peers and their instructor to experiment with new ideas and complete exercises. Creative lessons encourage cadets to actively participate by providing them with interactive opportunities, rather than simply sit and watch or listen to the instructor.

Identify Cadets' Weaknesses

Continually involving cadets in interactive activities provides an observant instructor with numerous opportunities to identify who is doing well and who is experiencing difficulty. The instructor can then intervene and make changes to immediately meet that need rather than wait for the lesson or a series of lessons on the one topic to be concluded and tested.

Encourage the Cadets to Interact With One Another

Creative learning activities actively encourage social interactions between the cadets and their peers, and the cadets and their instructors. Learning is an active social process which cadets need to practice if they are to get the most out of the Cadet Program.

Pace Learning

To pace learning is to challenge the cadets just beyond their present level of ability. If challenged too far, cadets give up but if challenged too little, they become bored. The trick is to stimulate cadets to the point of mild discomfort, forcing them to learn something knew.

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BENEFITS OF CREATIVE LESSONS WORKSHEET

Prevent Disruptions

Many times cadets _____ during a lesson because of boredom. Creative lessons _____ the cadets'_____ on the _____ and they are too busy to _____.

Engage Cadets

If the instructor conducts activities that physically and mentally involve the cadets they assume more _____ for their own learning and the instructor becomes a _____.

Involve More Cadets

In a _____ lesson, the instructor talks more than _____ of the time mostly giving _____ and _____. In _____ lessons the instructor communicates _____ to the whole _____ and more with individual _____ or _____ of cadets.

Bridge the Gap Between Watching (Passive) and Doing (Active)

Creative lessons encourage cadets to _____by providing them with _____ rather than simply _____ and _____ or _____ to the instructor.

Identify Cadets' Weaknesses

Involving cadets in interactive activities provides an observant _____ with numerous opportunities to identify who is doing _____ and who is experiencing _____. The instructor can then _____ these cadets rather than wait for the lesson to be over.

Encourage the Cadets to Interact With One Another

Creative learning activities actively encourage _____ between the cadets and their _____ and the cadets and their _____.

Pace Learning

Creative lessons challenge the cadets just _____ their present level of ability. If challenged too far, cadets _____ but if challenged too little, they become _____.

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BENEFITS OF CREATIVE LESSONS ANSWER KEY

Prevent Disruptions

Many times cadets ***misbehave*** during a lesson because of boredom. Creative lessons ***focus*** the cadets' ***attention***on the ***lesson*** and they are too busy to ***become disruptive*****.**

Engage Cadets

If the instructor conducts activities that physically and mentally involve the cadets they assume more ***responsibility***for their own learning and the instructor becomes a ***guide*****.**

Involve More Cadets

In a ***traditional*** lesson, the instructor talks more than ***two thirds*** of the time mostly giving ***instructions*** and ***answering questions*****.** In ***creative*** lessons the instructor communicates ***less*** to the whole ***group*** and more with individual ***cadets*** or ***small groups*** of cadets.

Bridge the Gap Between Watching (Passive) and Doing (Active)

Creative lessons encourage cadets to ***actively participate*** by providing them with ***interactive opportunities*** rather than simply ***sit*** and ***watch*** or ***listen*** to the instructor.

Identify Cadets' Weaknesses

Involving cadets in interactive activities provides an observant ***instructor***with numerous opportunities to identify who is doing ***well***and who is experiencing ***difficulty*****.** The instructor can then ***help*** these cadets rather than wait for the lesson to be over.

Encourage the Cadets to Interact With One Another

Creative learning activities actively encourage ***social interactions*** between the cadets and their ***peers*** and the cadets and their ***instructor*****.**

Pace Learning

Creative lessons challenge the cadets just ***beyond*** their present level of ability. If challenged too far, cadets ***give up*** but if challenged too little, they become ***bored*****.**

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BENEFITS OF CREATIVE LESSONS PHRASE STRIPS

Cut-out each strip.

IDENTIFIES CADETS' WEAKNESSES

MORE CADET INTERACTIONS

PACE LEARNING

THE CREATIVE PROCESS

STAGE	DESCRIPTION	ACTION
Preparation	Look at the lesson content in as many different ways as possible. Brainstorm possible creative elements to include in the lesson. Decide generally where to include creative elements in the lesson.	Use visualizations such as diagrams, charts, and webs. Individually brainstorm at first. Group brainstorm with other creative people if necessary. Take time to reflect on the lesson and mentally picture what you would like to see happen during the lesson.
Incubation	Collect and sort all relevant information. Continue to analyze and imagine ways to deliver the lesson. Make connections between the two like or unusual items. Prepare for the accident or eureka moment when everything falls into place.	Become an expert on the subject of the lesson. Do the homework. Combine and recombine ideas, hunches and thoughts into different combinations no matter how much they are unlike or unusual. Use the forced analogy. Use reversal. Ask "How can the lesson be made boring?" This may kick start your creativity. Use provocation by making the statement: "Lessons should not be creative". Ask "What have I done?" rather than "Why have I failed?".
Illumination or Eureka	Everything falls into place often when the problem is not being thought of at all.	Relax. Creativity is found in the subconscious mind which is more accessible in a relaxed state.
Verification	Decide if the new idea, insight, hunch or thought works. Continue testing and improving the new idea, insight, hunch or thought.	Decide if the new idea improves the lesson or is merely a gimmick. Write the lesson. Never create something to be used forever.

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FORCED ANALOGY

FORCED ANALOGY—MATCHBOX

MATCHBOX	LOCAL SQUADRON
Striking surface on two sides	
Two Parts	
Sliding Centre	
Cardboard	
Decorated with print and colours	
Contains Matches	

FORCED ANALOGY—PENCIL

PENCIL	ASPECT OF THE CANADIAN CADET ORGANIZATION (CCO) SYMBOLIZED
Silver Ring	
Yellow Colour	
Six Sides	
Flat Sides	
Eraser	
Wood Shaft	
Lead	
Write	
Inexpensive	

FORCED ANALOGY

QUESTIONS:

1. What is the first stage of the creative process?

2. What is one technique which can be used in the incubation stage to make a connection between unlike elements?

3. What happens during the illumination or eureka stage?

4. What happens during the verification stage?

FORCED ANALOGY GUIDE

The following is a list of possible answers. Use these answers to help guide cadets if they are having difficulty with the activity.

FORCED ANALOGY—MATCHBOX

MATCHBOX	LOCAL SQUADRON
Striking surface on two sides	Flexibility
Two Parts	Officers and Cadets
Sliding Centre	More than one way to do things
Cardboard	Easily broken / can not be careless
Decorated with print and colours	Lots of fun activities
Contains Matches	Danger–always practice safety

FORCED ANALOGY—PENCIL

PENCIL	ASPECT OF THE CANADIAN CADET ORGANIZATION (CCO) SYMBOLIZED
Silver Ring	Cadets receive medals and awards
Yellow Color	At Cadet Summer Training Centres different trades are identified by different colors
Six Sides	Cadet leaders have to remember to do many things
Flat Sides	Some aspects of cadet life are traditional
Eraser	Some cadets / officers / aspects of cadet life should be changed
Wood Shaft	Customs and traditions
Lead	Cadets can be challenging–get the lead out
Write	Cadets write lessons, orders, logbooks, attendance rolls, etc.
Inexpensive	The CCO offers many opportunities at little cost

FORCED ANALOGY—PENCIL (alternate)

PENCIL	ASPECT OF THE CANADIAN CADET ORGANIZATION (CCO) SYMBOLIZED
Silver Ring	Highest Rank
Yellow Colour	Value excellence
Six Sides	Different types of training
Flat Sides	Things will not always run smoothly–pencil does not roll smoothly
Eraser	Colour represents the poppy
Wood Shaft	The Cadet Program is structured
Lead	In the centre of the pencil representing the aims of the CCO
Write	Good experience to put on a resume
Inexpensive	Can not always do things because of lack of money

QUESTIONS:

Q1. What is the first stage of the creative process?

Q2. What is one technique which can be used in the incubation stage to make a connection between unlike elements?

Q3. What happens during the illumination or eureka stage?

Q4. What happens during the verification stage?

ANTICIPATED ANSWERS:

A1. The first stage is the preparation stage.

A2. The forced analogy, reversal and provocation techniques can be used in the incubation stage.

A3. An answer falls into place often unexpectedly.

A4. In the verification stage the instructor must decide if the new idea improves the lesson or is merely a gimmick, write the lesson and continually update the lesson.

WAYS TO INCORPORATE CREATIVITY

INTRODUCTION–USE ATTENTION-GETTING DEVICES

In the introduction, the instructor should capture the cadets' interest and motivate them to learn by using attention-getting devices, such as:

- an interesting fact related to the lesson topic that shocks, surprises or arouses curiosity;
- an unusual statistic related to the lesson topic;
- a personal anecdote related to the topic;
- a rhetorical question—the instructor does not want or expect the cadets to answer;
- an overt-response question—the instructor does want or expect the cadets to answer;
- an interesting quotation by a famous person;
- a visual demonstration such as an object, picture or some other representation that relates to the topic; and
- an explanation of how the topic is relevant to the cadets' lives or in their best interest.

BODY–USE INFORMATION-PROCESSING TECHNIQUES

Rally robin. In pairs, cadets alternate generating oral responses.

Round robin. In teams, students take turns responding orally.

Pairs check. One partner solves a problem while the other coaches. Then they switch roles. After every two problems, pairs check their answers with another pair and celebrate.

Rally coach. Partners take turns, one solving a problem while the other coaches.

Timed pair share. In pairs, cadets share with a partner for a predetermined time while the partner listens. Then partners switch roles.

CONFIRMATION–ACTIVITIES

Jigsaw worksheets. Instead of having cadets complete a worksheet individually, break them into small groups and assign a portion of the worksheet to each group. Each group must complete its assigned portion of the worksheet and use a poster or some other presentation aid to present the information to the whole group.

Graphics. Have the cadets create graphic organizers such as webs or mobiles to summarize information.

Creative writing. Have the cadets create rhymes, poems or songs to summarize information. If teaching terminology, symbols or similar information, have the cadets write a fairy tale or children's story using the information.

Create a chart. Type chronological information using a large font and cut it up into strips. Organize the cadets into pairs or small groups and give each pair or group an envelope with the strips of information and have them work together to place the information in the correct order and paste it on a sheet of chart paper. Time the activity for fun.

Information chain. Have each cadet write one fact that they have learned during the class on a piece of coloured paper, if possible. Have the class line up in front of the room and invite the first cadet to read their slip then fold it into a link and staple it. Invite the next student to read a fact and attach it to the chain and continue in this fashion until all cadets have created a link.

Scavenger hunt. Teach identification lessons by planting clues around the room and having cadets engage in a scavenger hunt. The clues may be actual items or pictures of items. When cadets find an actual item or some representation of it, they must describe the item to the group.

Road trip. Create a road trip. Place stop signs around the room containing information describing what the cadet must do. The cadets travel to each place, complete the activity and have their passport stamped.

CONCLUSION

Read the closing statement directly from the lesson plan. Re-motivate the cadets by referring back to the introduction and stress how the material is relevant to their personal lives or in their best interest.

Finish in a dramatic manner with an attention-getting device such as that used to introduce the lesson.

COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 10

EO C409.05 – ACT AS AN ASSISTANT DRILL INSTRUCTOR

Total Time: 90 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

PRE-LESSON ASSIGNMENT

The course officer shall communicate with the training officer to ensure that cadets are paired with a Proficiency Level One, Two or Three drill instructor during a regular training session. As part of the training session, the instructor and cadet should be scheduled for two periods of instruction. The time the cadet is not instructing may be used for lesson preparation, briefing, debriefing, securing training aids, etc.

A number of factors may exist based on the size of the squadron that will not allow for all Proficiency Level Four cadets to be scheduled for this EO at the same time. In this circumstance, special consideration should be given to minimize the cadet's absence from other areas of training. For example, scheduling half of the cadets for this EO while the other half is scheduled for EO C440.02 (Launch a Small Model Rocket) and reversing the schedule for the following training session.

APPROACH

OJT was chosen for this lesson as it allows the cadets to assist instructing a drill lesson in a safe and controlled environment. The OJT experience provides the cadets a practical application of learned skills in a realistic setting. The cadets reflect on the experience and receives feedback on the performance, which helps to shape future experiences. The cadets develop a sense of responsibility from the OJT aiding their development as a leader.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have acted as an assistant drill instructor.

IMPORTANCE

It is important for cadets to act as an assistant drill instructor as it gives them the opportunity to practice, observe and assist in performing the duties of a drill instructor in a safe and controlled environment during a regular training session.

Teaching Point 1 **Have the cadets act as assistant drill instructors in on-the-job training (OJT).**

Time: 90 min Method: On-The-Job Training

PURPOSE

The purpose of having the cadets act as assistant drill instructors is to provide them with an authentic experience that allows them to observe and assist in performing the duties of a drill instructor during a regular training session. This activity is intended to be experiential in nature, providing the cadets the opportunity to work with experienced instructors, with assessment for learning being the focus rather than assessment of learning. When pairing the cadets with an instructor, consideration must be given to such things as the background, specialty and confidence of each cadet while in front of a class. The proper pairing of cadets with an instructor will help to ensure the OJT experience satisfies the stated purpose.

GENERAL INSTRUCTIONS

For one training session the cadets shall be paired with an instructor who is instructing a group of cadets participating in PO 108 (Participate in an Annual Ceremonial Review Parade), PO 208 (Execute Drill as a Member of a Squad) or PO 308 (Direct a Squad Prior to a Parade).

The instructor is responsible for the following:

1. Ensure the cadet is briefed on their responsibilities and tasks prior to the commencement of the lesson.
2. Ensure the cadet is provided opportunities to perform some or all tasks normally completed by the instructor, such as:
   a. **Preparing training aids as required.** The cadet may be asked to gather and prepare training aids.

The focus of this EO should be the development of instructional skills and increasing experience and confidence while in front of a class. The instructor should develop training aids for the lesson. Give the cadet tasks such as setting up presentation aids and organizing training aids, eg, signing out rifles for a rifle drill lesson.

   b. **Helping instruct the lesson.** The cadet may be asked to provide a demonstration or instruct a TP of a lesson.
   c. **Supervising the cadets.** The cadet may be asked to assist with the supervision of the cadets.
   d. **Providing assistance as required.** The cadet may be asked to provide assistance or assist with skill development by coaching or demonstrating a skill being taught.
   e. **Securing training aids as required.** Once the lesson is complete, the cadet may be asked to secure and return training aids to storage.
3. If necessary, debrief the (Proficiency Level One, Proficiency Level Two or Proficiency Level Three) cadets, correcting any content errors or omissions made by the cadet.
4. Debrief the cadet upon completion of the training session and provide them the opportunity to ask questions and seek additional feedback.

CONFIRMATION OF TEACHING POINT 1

The cadets' acting as an assistant drill instructor will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' acting as an assistant drill instructor will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Acting as an assistant drill instructor allows for the development of skills necessary to become a competent drill instructor by observing, practicing instruction and receiving feedback from an experienced drill instructor in a safe and controlled environment during a regular training session.

INSTRUCTOR NOTES / REMARKS

Prior to this EO, the course officer shall communicate with the training officer to ensure that cadets are paired with a Proficiency Level One, Two or Three drill instructor for a regular training session.

A number of factors may exist based on the size of the squadron that will not allow for all Proficiency Level Four cadets to be scheduled for this EO at the same time. In this circumstance, special consideration should be given to minimize the cadet’s absence from other areas of training. For example, scheduling half of the cadets for this EO while the other half is scheduled for EO C440.02 (Launch a Small Model Rocket) and reversing the schedule for the following training session.

During this EO the instructor shall:

1. brief the cadet prior to commencing the lesson;
2. assign the cadet tasks, to include:
    a. preparing training aids as required;
    b. helping instruct the lesson;
    c. supervising the cadets;
    d. providing assistance as required; and
    e. securing training aids as required;
3. monitor the cadet; and
4. debrief the cadet at the end of the lesson.

REFERENCES

Nil.

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COMMON TRAINING

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 11

EO C409.06 – INSTRUCT A 30-MINUTE DRILL LESSON

Total Time: 90 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

The course officer shall communicate with the training officer to:

1. place the Proficiency Level Four cadets into the Proficiency Level One and Proficiency Level Two drill instructor schedules;
2. ensure the cadets are assigned a 30-minute lesson at least one week prior to conducting this assessment, to include:
   a. a lesson specification, and
   b. an instructional guide; and
3. assign an assessor to each lesson.

Ensure that all resources requested by the cadets are available.

Photocopy the Drill Instructional Techniques Assessment Form located at Attachment A for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

A practical activity was chosen for this lesson as it is an interactive way for cadets to develop drill instructional skills in a safe and controlled environment.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have instructed a 30-minute drill lesson using a written lesson plan and the drill instruction sequence.

IMPORTANCE

It is important for cadets to instruct a 30-minute drill lesson as it gives them the opportunity to practice drill instructional skills in a practical setting and to receive feedback to further develop instructional skills and confidence.

Teaching Point 1 **Supervise while the cadets instruct a 30-minute lesson.**

Time: 85 min Method: Practical Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to have the cadets instruct a 30-minute drill lesson using a written lesson plan and the drill instruction sequence.

RESOURCES

Drill Instructional Techniques Assessment Form.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Have each cadet, prior to the start of this lesson:
   a. research lesson content;
   b. plan a lesson;
   c. develop instructional aids (as required); and
   d. set up the lesson location (as required).
2. During the time allotted for this lesson, have each cadet:
   a. provide a copy of their written lesson plan to the assessor;
   b. instruct a 30-minute drill lesson by:
      (1) introducing the lesson;
      (2) presenting the content of the lesson;
      (3) applying the drill instruction sequence;
      (4) confirming the skills learned during the lesson; and
      (5) concluding the lesson; and
   c. participate in an individual feedback session with the assessor upon completion of the lesson.

The Drill Instructional Techniques Assessment Form located at Attachment A is used to provide feedback on the cadet's lesson. The form is intended solely for the purposes of assessment for learning, providing the cadets with the feedback they need to improve their own skills.

3. Once all cadets have instructed a 30-minute drill lesson, debrief the (Proficiency Level Four) cadets by providing feedback, focusing on:

    a. best practices,

    b. general trends and key areas for improvement, and

    c. re-motivation, highlighting the effort and accomplishments of the group.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the activity will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadet's instructing a 30-minute drill lesson will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Practicing drill instruction allows for the development of fundamental skills necessary to become a drill instructor while further developing confidence and providing a sense of accomplishment.

INSTRUCTOR NOTES / REMARKS

This EO shall be conducted after C309.04 (Identify Formations for Drill Instruction), EO C309.05 (Plan a Drill Lesson) and EO C309.06 (Instruct a 15-Minute Drill Lesson).

The cadets shall instruct Proficiency Level One or Proficiency Level Two cadets on a regular training session.

The course officer shall communicate with the training officer to:

1. place the Proficiency Level Four cadets into the instructor schedule; and

2. ensure the cadets are assigned a lesson at least one week prior to conducting this EO, to include:

    a. a lesson specification, and

    b. an instructional guide.

Time for lesson planning for this EO is available in EO C309.05 (Plan a Drill Lesson), should the course officer deem it necessary.

Adjust the period allocation for this EO if all three periods are not required for each Proficiency Level Four cadet to instruct a 30-minute drill lesson.

REFERENCES

A0-002 A-PD-201-000/PT-000 Director History and Heritage 3-2. (2005). *The Canadian Forces manual of drill and ceremonial*. Ottawa, ON: Department of National Defence.

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DRILL INSTRUCTIONAL TECHNIQUES

ASSESSMENT FORM

Cadet's Name: _____ Division: _____

Lesson Topic: _____

CRITERIA	COMMENTS	Incomplete	Completed With Difficulty	Completed Without Difficulty
PREPARATION				
Maintained dress and deportment.				
Selected an appropriate squad formation.				
Used a lesson plan.				
Reviewed previous lesson.				
INTRODUCTION				
Stated what the cadets will learn.				
Stated why it is important.				
Stated where / when this skill will be applied.				
BODY				
Demonstrated complete movement, calling the time.				
Demonstrated and explained the first part of the movement (Squad 1).				
Had the squad practice the first part of the movement collectively, individually and collectively again.				
Taught the second part of the movement and each subsequent part in the same manner.				
Gave two complete demonstrations.				

CRITERIA	COMMENTS	Incomplete	Completed With Difficulty	Completed Without Difficulty
Practiced the complete movement with: • the instructor calling the time, • the cadets calling the time, and • the cadets judging the time.				
Used clear words of command and correct pauses.				
Gave appropriate and immediate feedback.				
Allowed questions after each movement.				
END OF LESSON CONFIRMATION				
Demonstrated the movement taught.				
Confirmation was conducted as a squad.				
Emphasized aspects of the movement with which the cadets experienced difficulty.				
CONCLUSION				
Summarized the lesson.				
Re-motivated the cadets.				
FEEDBACK				

ASSESSOR'S SIGNATURE

DATE

CADET'S SIGNATURE

COMMON TRAINING

ALL TRAINING LEVELS

CANADIAN ARMED FORCES (CAF) FAMILIARIZATION

INSTRUCTIONAL GUIDE

SECTION 1

PO X20 – PARTICIPATE IN CAF FAMILIARIZATION

Total Time:

For the following EOs, refer to the lesson specifications located in A-CR-CCP-801/PG-001, *Royal Canadian Air Cadets Proficiency Level One Qualification Standard and Plan*:

- MX20.01A – Participate in a CAF Activity,
- MX20.01B – Participate in a CAF Familiarization Tour,
- MX20.01E – Attend a CAF Presentation,
- MX20.01F – Attend a CAF Commemorative Ceremony, and
- CX20.01 – Participate in CAF Familiarization Activities.

For the following EOs, refer to the instructional guides located in A-CR-CCP-801/PF-001, *Royal Canadian Air Cadets Proficiency Level One Instructional Guides*:

- MX20.01C – Fire the C7 Rifle,
- MX20.01D – Participate in a Mess Dinner,
- MX20.01G – Participate in CAF Familiarization Video Activities, and
- MX20.01H – Participate in CAF Familiarization Learning Stations.

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ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 1

EO C429.01 – EXPLAIN REGULATIONS AND OPERATING PROCEDURES FOR AVIATION TRANSMISSION AND LICENSING

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy the *Study Guide for the Restricted Operator Certificate With Aeronautical Qualification (ROC-A)* (RIC-21) available at http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/sf01397.html, for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to clarify, emphasize and summarize regulations and operating procedures for aviation transmission and licensing.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have explained regulations and operating procedures for aviation transmission and licensing.

IMPORTANCE

It is important for cadets to explain regulations and operating procedures as the knowledge gives the cadets a better understanding of aviation transmission and licensing procedures. This knowledge is required to obtain the Industry Canada Restricted Operator Certificate with Aeronautical Qualification (ROC-A).

Distribute one copy of the *Study Guide for the Restricted Operator Certificate With Aeronautical Qualification (ROC-A) (RIC-21)* to each cadet. Have the cadets follow along with the study guide as content is presented.

Teaching Point 1 **Explain priorities, privacy, and control of communication.**

Time: 5 min Method: Interactive Lecture

PRIORITIES

The priority of messages by flight service stations are:

- emergency communications, to include:
  - distress communication, and
  - urgency communications;
- flight safety communications, such as:
  - air traffic control (ATC) clearances,
  - airport advisories,
  - position reports, and
  - air file flight plans;
- scheduled broadcasts,
- unscheduled broadcasts,
  - notices to airmen (NOTAMS),
  - significant meteorological information (SIGMET), and
  - pilot weather report (PIREP); and
- other air-ground communications.

PRIVACY

No person shall reveal the contents, or the existence of communications transmitted, received, or intercepted by a radio station. Exceptions to this rule include revealing the contents to:

- the addressee of the message,
- authorized officials of the Government of Canada,
- officers of the court, and
- the operator of a telecommunication system necessary to forward or deliver the message.

The restrictions do not apply to the following messages:

- distress,
- urgency,
- safety, and
- ALL STATIONS addressed, such as:
    - weather reports, and
    - storm warnings.

CONTROL OF COMMUNICATION

An aircraft station will comply with instructions given by a ground station relating to:

- the order and time of transmission,
- the choice of frequency, and
- the duration and suspension of communications.

The ground station normally retains transmission control with communications between ground and aircraft stations.

The aircraft station called by another aircraft becomes the controlling station.

Radio communication between stations should be restricted to safety and flight regularity. Unauthorized communication, profane or obscene language, and calls that interfere with or interrupt the working of another radio station can result in a fine not exceeding $5 000 and / or imprisonment for a term not exceeding one year. Anyone who knowingly sends, transmits, or causes any false or fraudulent distress signal, message, call, or radiogram of any kind may receive similar fines and / or imprisonment. A corporation can be fined up to $25 000.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What messages have highest priority?

Q2. Which station retains transmission control between ground and aircraft stations?

Q3. What is the maximum fine given to an individual for unauthorized communications or interference with another radio station?

ANTICIPATED ANSWERS:

A1. Emergency communications.

A2. Ground station.

A3. $5 000.

Teaching Point 2 **Explain time, date, and transmission of numbers.**

Time: 5 min Method: Interactive Lecture

Have the cadets follow along with the study guide as content is presented.

TIME

The 24-hour system is used to express time during radiocommunication. Time is expressed using four figures; the first two representing the hour past midnight and the last two representing the minutes past the hour.

Time is usually referenced to one standard time zone. If communication is conducted in a single time zone, local time is used.

Standard time zones are indicated as the following:

- Newfoundland N
- Atlantic A
- Eastern E
- Central C
- Mountain M
- Pacific P
- Yukon Y

Examples of time references include:

- 12:45 a.m. expressed as 0045,
- 7:40 a.m. expressed as 0740,
- 12:00 p.m. expressed as 1200,
- 1:35 p.m. expressed as 1335,
- 4:07 p.m. (EST) expressed as 1607 E,
- 7:40 p.m. expressed as 1940, and
- 9:50 p.m. (PST) expressed as 2150 P.

Coordinated Universal Time (UTC), also known as Zulu time (Z) or Greenwich Mean Time (GMT), is used to avoid confusion between different time zones. An example of UTC is 0539Z expressed as ZERO FIFE TREE NINER ZULU.

To convert local time to Zulu time add:

- 2.5 hours to Newfoundland Daylight Time (NDT),
- 3.5 hours to Newfoundland Standard Time (NST),
- 3 hours to Atlantic Daylight Time (ADT),
- 4 hours to Atlantic Standard Time (AST),
- 4 hours to Eastern Daylight Savings Time (EDT),
- 5 hours to Eastern Standard Time (EST),
- 5 hours to Central Daylight Savings Time (CDT),
- 6 hours to Central Standard Time (CST),
- 6 hours to Mountain Daylight Savings Time (MDT),
- 7 hours to Mountain Standard Time (MST),
- 7 hours to Pacific Daylight Savings Time (PDT), and
- 8 hours to Pacific Standard Time (PST) .

DATE

The date is expressed as a six-figure group. The first two figures represent the day of the month and the last four figures indicate the time.

TRANSMISSION OF NUMBERS

When referring to numbers, each digit is pronounced separately, except whole thousands. Whole thousands are communicated by pronouncing each digit in the number of thousands followed by the word thousand expressed as TOU-SAND. The word hundred is expressed as HUN-DRED. If a decimal is within the number, the word decimal is pronounced DAY-SEE-MAL. For example:

- 8 000 is expressed as AIT TOUSAND,
- 150 is expressed as WUN FIFE ZERO, and
- 75 is expressed as SEVEN FIFE.

Monetary denominations are transmitted with groups of digits including the decimal. Dollars is expressed if monetary denomination is higher than one dollar. For example, $28.45 is expressed as DOLLARS TOO AIT DAY-SEE-MAL FOWER FIFE.

Altitude above sea level is expressed in thousands plus hundreds of feet. Separate digits are used to express flight level. For example:

- 2 800 is expressed as TOO TOUSAND AIT HUNDRED, and
- FL375 is expressed as FLIGHT LEVEL TREE SEVEN FIFE.

Aircraft type numbers are expressed in group forms. For example:

- Flight 498 is expressed as FLIGHT FOWER NINER AIT, and
- DC10 is expressed as DC TEN.

Wind speed and cloud formation heights are expressed in group forms. For example:

- Wind 270 / 10 is expressed as WIND TOO SEVEN ZERO DEGREES WUN ZERO KNOTS, and
- 36BKN is expressed as THIRTY SIX HUNDRED BROKEN.

Aircraft headings are given in groups of three digits. For example:

- 005 degrees is expressed as HEADING ZERO ZERO FIFE, and
- 350 degrees is expressed as HEADING TREE FIFE ZERO.

Aerodrome elevation is expressed in feet using the expression FIELD ELEVATION. For example:

- 178 is expressed as FIELD ELEVATION WUN SEVEN AIT, and
- 4900 is expressed as FIELD ELEVATION FOWER TOUSAND NINER ZERO ZERO.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. How is time expressed for the 24-hour system?

Q2. How many figures will be used to express date and time together?

Q3. How is aerodrome elevation expressed?

ANTICIPATED ANSWERS:

A1. Four figures.

A2. Six figures.

A3. In feet using the expression FIELD ELEVATION.

Teaching Point 3 **Explain operating procedures.**

Time: 5 min Method: Interactive Lecture

Have the cadets follow along with the study guide as content is presented.

OPERATING PROCEDURES

Words and Phrases

Slang expressions are not used during radiocommunication procedures including:

- ten-four,
- over and out,
- breaker-breaker, and
- come in please.

Standard phrases and words are used whenever applicable including:

Acknowledge	Let me know that you have received and understood this message.
Affirmative	Yes or permission granted.
Break	Indicates the separation between portions of the message (to be used where there is no clear distinction between the text and other portions of the message).
Channel	Change to Channel ____ before proceeding.
Cleared	Authorized to proceed under the conditions specified.
Confirm	Have I received the following ____? or Did you receive the message?
Correction	An error has been made in this transmission (or message). The correct version is ____.
Disregard	Consider this transmission as not sent.
Do you read?	I have called you more than once. If you are receiving me, reply.
Go ahead	Proceed with your message.
How do you read me?	What is the readability of my transmission?
I say again	I will repeat.
Monitor	Listen on (frequency).
Negative	No or that is not correct or I do not agree.
Out	Conversation is ended and no response is expected.
Over	My transmission is ended and I expect a response from you.
Read back	Repeat all or the specified part of this message back to me exactly as received (do not use the word Repeat).
Roger	Okay, I have received all of your last transmission.
Say again	Repeat.
Stand by	I must pause for a few seconds or minutes, please wait and I will call you.
Seelonce	International expression to indicate that silence has been imposed on the frequency due to a distress situation.
Seelonce feenee	International expression to indicate that the distress situation has ended.
That is correct	Self-explanatory.
Verify	Check coding or text to confirm with originator.

Wilco	Your instructions received, understood, and will be complied with.
Words twice	As a request, communication is difficult, please send each word or group of words twice, or As information, since communication is difficult, I will send each word or group of words twice.

Call Signs

Call signs are assigned for identification purposes and should be used when contact is being established and again when communications are concluded. An aircraft's call sign can be the same as the aircraft's markings. Transport Canada (TC) assigns call signs and marks to aircraft.

Aircraft marks include C- (Canadian nationality mark) followed by the four–letter registration marks with aircraft letters starting with G or F and ultralight letters starting with I.

Aircraft registered before January 1, 1974 are identified with the nationality mark CF.

Aeronautical call signs are pronounced phonetically. During the initial contact, the manufacturer's name or type of aircraft is included, followed by the four letters of the registration. In further communications, the caller letters can be abbreviated to the last three letters.

- Cessna 172 GFLR is expressed as CESSNA WUN SEVEN TOO GOLF FOXTROT LIMA ROMEO then FOXTROT LIMA ROMEO, and
- Ultralight IKKO is expressed as ULTRALIGHT INDIA KILO KILO OSCAR then KILO KILO OSCAR.

Air carriers. Companies use their name followed by the flight number or the last three characters of the aircraft registration.

Civil registration. Private aircraft use the manufacturer's name or the type of the aircraft followed by the last four letters of the registration.

Ground stations. The name of the airport or its geographical location followed by a suitable word indicating the function of the station.

Examples:

- Area control centre: OTTAWA CENTRE,
- Flight information service station: WINNIPEG INFORMATION,
- Surface movement control: TORONTO GROUND,
- Private aeronautical station: RADIO, and
- Company dispatch: DISPATCH.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. Why are call signs assigned?

Q2. Who assigns call signs?

Q3. How are ground station call signs created?

ANTICIPATED ANSWERS:

A1. Identification purpose.

A2. TC.

A3. Call signs are comprised of:

- name of the airport, or the airport geographical location, and
- suitable word indicating the function of the station.

Teaching Point 4 **Explain calling procedures.**

Time: 10 min Method: Interactive Lecture

Have the cadets follow along with the study guide as content is presented.

CALLING PROCEDURES

A ground station that has a radio message for an aircraft within its operational service area may call the aircraft. When a ground station receives calls from several aircraft, the ground station will decide the order to take the calls.

If the radio conditions are good, the station's call sign is stated once but if conditions are poor, it is stated three times.

All stations shall listen to the communication channel before transmitting to ensure the transmission will not interfere with communication already in progress.

A station that has distress, urgency, or safety communications to transmit can interrupt a transmission of lower priority that is in progress.

The call sign of the station or aircraft being called is always spoken first followed by THIS IS and the calling station's or aircraft's call sign.

Single Station Call

A transmission is sent to a single station by stating:

- the call sign of the station being called,
- this is,
- the call sign of the station calling,
- the frequency on which the calling station is transmitting, and
- over (invitation to reply).

Example:

OTTAWA TOWER, (OTTAWA TOWER, OTTAWA TOWER),
THIS IS,
CESSNA WUN SEVEN TOO FOXTROT ALFA DELTA TANGO,
ON FREQUENCY WUN WUN AIT DAY-SEE-MAL SEVEN,
OVER.

All Station General Call

When a station needs to establish communication with any station within range or in a certain area, the call should be made to all stations.

Example:

ALL STATIONS, ALL STATIONS, ALL STATIONS,
THIS IS,
TORONTO RADIO (say three times if necessary),
BE ADVISED OF ___ IN THE AREA ___,
OUT.

Multiple Station Call

When more than one station is being called, the call signs of the desired stations may be transmitted in any sequence followed by THIS IS. The operators replying to multiple station calls should reply in the order in which they were called.

Example:

CESSNA WUN SEVEN TOO FOXTROT NOVEMBER INDIA LIMA,
PIPER FOXTROT X-RAY QUEBEC QUEBEC,
PIPER GOLF LIMA LIMA DELTA,
THIS IS,
TORONTO RADIO (say three times if necessary),
OVER.

Replying

Operators hearing a call directed to their station shall reply as soon as possible and advise the calling station to proceed, GO AHEAD or not to proceed with the message, STAND BY followed by the anticipated number of minutes of delay.

Example:

CESSNA WUN SEVEN TOO FOXTROT NOVEMBER INDIA LIMA,
THIS IS,
TORONTO TOWER,
GO AHEAD.

PIPER GOLF LIMA LIMA DELTA,
THIS IS,
TORONTO TOWER,
STAND BY TOO MINUTES.

Corrections and Repetitions

If an error is made during a transmission, the word correction is spoken followed by the correct word or phrase.

Example: PROCEED TO DOCK FIFE CORRECTION DOCK SEVEN.

If the receiving station requires an entire message to be repeated, the operator states SAY AGAIN. If only a portion of the message is required, the receiving station says the following:

- SAY AGAIN ALL BEFORE ____ (the first word satisfactorily received);
- SAY AGAIN ____ (the word before the missing portion) TO ____ (the word after the missing portion); and
- SAY AGAIN ALL AFTER ____ (the last word satisfactorily received).

Example:

VANCOUVER RADIO,
THIS IS,
STINSON FOXTROT ALFA BRAVO CHARLIE,
SAY AGAIN ALL BEFORE HANGAR,
OVER.

WINNIPEG TOWER,
THIS IS,
STINSON FOXTROT ALFA BRAVO CHARLIE,
SAY AGAIN ALTITUDE TO DESCEND,
OVER.

MONTREAL CENTRE,
THIS IS,
STINSON FOXTROT ALFA BRAVO CHARLIE,
SAY AGAIN ALL AFTER FLIGHT PLAN,
OVER.

Message Handling Procedures

When transmitting a message, the radio operator should:

1. Plan the message content before transmitting.
2. Listen briefly before starting to transmit the message to avoid interfering with other transmissions.
3. Deliver the radio message clearly and concisely using standard phrases.

The message format normally consists of the following four parts:

1. The call sign indicating the addressee and the originator.
2. The addressee reply.
3. The message.
4. The acknowledgement or ending.

The words THIS IS and OVER can be omitted on subsequent calls once the initial contact has been made with the addressee.

Example:

Call-up by aircraft	BROCKVILLE RADIO, THIS IS, PIPER FOXTROT ALFA BRAVO CHARLIE, OVER.
Reply by ground station	PIPER FOXTROT ALFA BRAVO CHARLIE, THIS IS, BROCKVILLE RADIO, GO AHEAD.
Message–Aircraft	BROCKVILLE RADIO, PIPER FOXTROT ALFA BRAVO CHARLIE, FOWER MILES AT WUN THOUSAND, LANDING BROCKVILLE.
Message–Ground	PIPER FOXTROT ALFA BRAVO CHARLIE, BROCKVILLE RADIO, ROGER, WIND WUN SIX ZERO DEGREES AT WUN FIFE KNOTS, ALTIMETER TOO NINER NINER SEVEN.
Acknowledgement–Aircraft	BROCKVILLE RADIO, PIPER FOXTROT ALFA BRAVO CHARLIE, ROGER, OUT.

Signal (or Radio) Checks

Call using the appropriate frequency that will not interfere with the normal work of other aircraft or ground stations.

A signal (or radio) check is conducted by:

- calling another aircraft or ground station to request a signal check;
- stating signal (or radio) check 1, 2, 3, 4, 5. How do you read me? Over;
- including station call sign;
- transmitting the signal for less than 10 seconds; and
- replying or receiving a reply to a signal (or radio) check, use the following readability scale:
    - 1–bad (unreadable),
    - 2–poor (readable now and then),
    - 3–fair (readable but with difficulty),
    - 4–good (readable), and
    - 5–excellent (perfectly readable).

Communication checks are categorized as follows:

- signal check (made while aircraft is airborne),
- pre-flight check (made prior to departure), and
- maintenance check (made by ground maintenance).

Example:

Call-up by aircraft	WATSON LAKE RADIO, THIS IS, CESSNA FOXTROT ALFA BRAVO CHARLIE, REQUEST SIGNAL CHECK ON FREQUENCY FIFE SIX DAY-SEE-MAL AIT ZERO.
Response by station	CESSNA FOXTROT ALFA BRAVO CHARLIE, THIS IS, WATSON LAKE RADIO, READING YOU STRENGTH FIFE, OVER.

CONFIRMATION OF TEACHING POINT 4

QUESTIONS:

Q1. When is the call sign not stated three times?

Q2. When can a station interrupt with the call of another station?

Q3. What does the radio operator do when transmitting a message?

ANTICIPATED ANSWERS:

A1. When the radio conditions are good.

A2. When it has a distress, urgency, or safety communication to transmit.

A3. The radio operator will:

- plan the message content;
- listen briefly before starting to transmit the message to avoid interfering with other transmissions; and
- deliver the radio message clearly and concisely using standard phrases.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. List the priority of messages.

Q2. How are date and time expressed?

Q3. What phrase is used when a station needs to establish communication with any station within range or in a certain area?

ANTICIPATED ANSWERS:

A1. Priority of messages include:

- emergency communications,
- flight safety communications,
- scheduled broadcasts,
- unscheduled broadcasts, and
- other air-ground communications.

A2. Six figures:

- first two figures represent the day of the month,
- next two figures represent the hour past midnight, and
- last two figures represent the minutes past the hour.

A3. ALL STATIONS.

CONCLUSION

HOMEWORK / READING / PRACTICE

Review the phonetic alphabet on page 6 in *Study Guide for the Radiotelephone Operator's Restricted Certificate (Aeronautical) (ROC-21)*.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001*Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, 429 PC.

CLOSING STATEMENT

Being able to explain regulations and operating procedures gives the cadets a better understanding of aviation transmission and licensing procedures. This knowledge is required to obtain the Industry Canada Restricted Operator Certificate with Aeronautical Qualification (ROC-A).

INSTRUCTOR NOTES / REMARKS

If the squadron chooses to have cadets obtain the ROC-A, all complimentary EOs for this PO must be instructed and a qualified examiner must conduct 429 PC.

Cadets who are qualified Advanced Aviation may assist with this instruction.

REFERENCES

C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Peppler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.

C3-182 *Study Guide for the Restricted Operator Certificate With Aeronautical Qualification (ROC-A) (RIC-21)*. (2008). Retrieved September 28, 2008, from www.ic.gc.ca/epic/site/smt-gst.nsf/en/sf01397e.html

ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 2

EO C429.02 – COMMUNICATE USING RADIO PROCEDURES FOR AVIATION TRANSMISSION

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Prepare the handouts located at Attachments A and B for each cadet.

PRE-LESSON ASSIGNMENT

Read and practice the phonetic alphabet on page 6 in *Study Guide for the Radiotelephone Operator's Restricted Certificate (Aeronautical) (ROC-A)*.

APPROACH

An interactive lecture was chosen for TP 1–4 to clarify, emphasize and summarize radio procedures for aviation transmission.

An in-class activity was chosen for TP 5 as an interactive way to confirm the cadets' comprehension of radio procedures for aviation transmission.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have communicated using common phrases, identified priority communications and emergency transmissions and conducted a radio check.

IMPORTANCE

It is important to know the correct radio phrases while communicating over a radio (for aviation transmissions). The cadet will use accurate terminology to communicate messages clearly and concisely.

Teaching Point 1 **Explain the standard phrases used in a radio message.**

Time: 5 min Method: Interactive Lecture

Distribute the handout showing procedural words and phrases located at Attachment A to each cadet.

The way that one talks on the air is guided by national and international standards. In aviation, common phrases and words are used to communicate radio messages. Citizen Band (CB) phrases, such as Ten-Four, Over and Out and Breaker Breaker will not be used.

Word or Phrase	Meaning
Acknowledge	Let me know that you have received and understood this message.
Affirmative	Yes, or permission granted.
Break	Indicates the separation between portions of the message. (To be used where there is no clear distinction between the text and other portions of the message.)
Confirm	My version is … Is that correct?
Correction	An error has been made in this transmission (message indicated). The correct version is ….
Do you read	I have called you more than once. If you are receiving me, reply.
Go ahead	Self-explanatory.
How do you read?	Self-explanatory.
I say again	Self-explanatory (use instead of "I REPEAT").
Negative	No, or that is not correct, or I do not agree.
Out	Conversation is ended and no response is expected.
Over	My transmission is ended and I expect a response from you.
Read back	Repeat all of this message back to me exactly as received after I have given "OVER" (do not use the word "REPEAT").
Roger	I have received all of your last transmission.
Say again	Self-explanatory. (Do not use the word "REPEAT".)
Speak slower	Self-explanatory.
Stand by	I must pause for a few seconds or minutes, please wait.
That is correct	Self-explanatory.
Verify	Check coding, check text with originator and send correct version.
Wilco	Your instructions received, understood and will be complied with.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What terminology will not be used when communicating an aviation radio message?

Q2. How do you say "Yes", or permission granted?

Q3. How do you say that the transmission has ended and a response is expected?

ANTICIPATED ANSWERS:

A1. CB phrases.

A2. Affirmative.

A3. Over.

Teaching Point 2 **Explain priority of communication.**

Time: 5 min Method: Interactive Lecture

PRIORITY OF COMMUNICATION

Radio transmissions are communicated in the following priority:

1. emergency communications, to include:
    a. distress,
    b. urgency,
    c. safety; and
2. flight safety communications, to include
    a. Air Traffic Control (ATC) clearance (authorization from ATC for an aircraft to land, take-off, etc),
    b. airport advisories (landing and takeoff information about wind direction and velocity, favoured runway, airport conditions such as snow, known hazards, etc),
    c. position reports (identification of surrounding aircraft, present position, altitude, type of flight plan and destination), and
    d. air filed flight plans, etc;
3. scheduled broadcasts (Automated Terminal Information Service (ATIS), recorded information for arriving and departing aircraft such as airport name, weather information, departure runways, etc);
4. unscheduled broadcasts, to include:
    a. Notices to Airmen (NOTAMS) (dangerous or restricted areas, airport construction, changes in navigation and control procedures),
    b. Significant Meteorological Information (SIGMET) (messages to aircraft in flight of severe and hazardous weather conditions which include severe turbulences, thunderstorms, etc), or
    c. Pilot Weather Report (PIREP) (unpredicted thunderstorms, turbulences, visibility, etc); and
5. other air-ground or air-to-air communications (conversations about personal information such as estimated time of arrival (ETA) for personal reasons, meals, etc).

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What type of communication has highest priority?

Q2. ATC clearance is where on the communication priority position?

Q3. Unscheduled broadcasts include what types of communication?

ANTICIPATED ANSWERS:

A1. Emergency communications (distress, urgency and safety calls).

A2. Second.

A3. Notices to Airmen (NOTAMS), Significant Meteorological Information (SIGMET) or a Pilot Weather Report (PIREP).

Teaching Point 3 **Explain emergency transmissions.**

Time: 5 min Method: Interactive Lecture

EMERGENCY TRANSMISSIONS

Emergency transmissions have first priority in communications and are transmitted using specific terms which are repeated three times.

Distress

Distress calls have absolute priority over all other transmissions. Anyone hearing it will cease any transmission capable of interfering. Distress calls indicate that the aircraft is threatened by grave and / or imminent danger, such as an engine loss and require immediate assistance.

The transmission for distress is "MAYDAY" "MAYDAY" "MAYDAY".

Urgency

Urgency calls are addressed to all stations or a specific station. Urgency calls concern the safety of the aircraft, someone on board or within sight, such as a lost position but does not require immediate assistance.

The transmission for urgency is "PAN PAN" "PAN PAN" "PAN PAN".

Safety

Safety messages address the safety of navigation or important meteorological warning to aircraft in flight such as severe turbulences.

The transmission for safety is "SECURITY" "SECURITY" "SECURITY".

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. What word do you use to start your radio transmission when your engine stops?

Q2. What word do you use to start your radio transmission when you have lost your position?

Q3. What word do you use to start your radio transmission when you want to report an important meteorological warning to other aircraft in flight?

ANTICIPATED ANSWERS:

A1. "MAYDAY".

A2. "PAN PAN".

A3. "SECURITY".

Teaching Point 4 **Explain a radio check.**

Time: 5 min Method: Interactive Lecture

RADIO CHECK

Radio checks are used to assess the serviceability of the communication equipment. Radio checks use a 1–5 scale to assess the readability and strength of the transmission.

Readability

Readability assesses the ability to understand the communication. Readability is confirmed using the scale of 1–5 to relate to levels of understanding to include:

- 1–unreadable,
- 2–readable now and then,
- 3–readable with difficulty,
- 4–readable, and
- 5–perfectly readable.

Strength

Strength assesses how strong the radio signal is being received. Strength is confirmed using the 1–5 scale which relates to levels of radio strength to include:

- 1–bad,
- 2–poor,
- 3–fair,
- 4–good, and
- 5–excellent.

When a radio check is requested, the response uses the numerical scale for readability then strength, such as 4 / 3 (readable / fair strength) or 3 / 5 (readable with difficulty / excellent strength). If both readability and strength are at the maximum scale, the response is five.

Radio checks may be conducted as part of the pre-flight check, ground maintenance check and while airborne to check the serviceability of communication equipment. Radio checks should not be conducted on an active ATC frequency.

CONFIRMATION OF TEACHING POINT 4

QUESTIONS:

Q1. Why is a radio check conducted?

Q2. A radio transmission is readable with difficulty and has good strength. What is the response?

Q3. Radio checks are done in three categories. Name each.

ANTICIPATED ANSWERS:

A1. To assess the serviceability of the communication equipment.

A2. Three by four.

A3. Signal check (when airborne), pre-flight check (prior to departure) and maintenance check (made by ground maintenance).

Teaching Point 5 **Have the cadets, in pairs, conduct station-to-station calls using the ITU phonetic alphabet and numbers, and conduct a signal check.**

Time: 5 min Method: In-Class Activity

ACTIVITY

Radios should be set to different frequencies. The cadets have previously learned this procedure during EO M290.06 (Operate a Hand-Held Radio).

The number of radios available per squadron varies. If necessary, one pair of cadets will complete the activity and a second pair of cadets will critique their technique. Groups will switch roles and repeat the activity.

OBJECTIVE

The objective of this activity is for the cadets to send and receive messages using the ITU phonetic alphabet and numbers.

RESOURCES

- Hand-held radio (one per group), and
- Radio Activity located at Attachment B.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into pairs.
2. Provide each pair of cadets with a hand-held radio and a copy of the radio activity.
3. Have the cadets complete the radio worksheet.
4. Have one cadet transmit the message to their partner by:
    a. turning the radio on;
    b. using message parts, to include:
        (1) initiating a call with "____" this is "____", over;
        (2) answering a call with "____" this is "____", go ahead, over";
        (3) requesting a signal check on a different frequency;
        (4) responding to the request; and
        (5) acknowledging the call and ending the call with "out";
    c. using radio techniques; and
    d. turning the radio off.
5. Have the cadets switch roles and repeat Step 4.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 5

The cadets' participation in the activity will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. How do you say that the transmission has ended and you expect a response?

Q2. Air-ground and air-to-air communication of a personal nature is where on the communication priority?

Q3. What three words are used and in what order, to announce emergency transmissions?

Q4. During a radio check, both readability and strength are at the maximum, what is the response?

ANTICIPATED ANSWERS:

A1. Over.

A2. Last.

A3. MAYDAY, PAN PAN, AND SECURITY.

A4. Five.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001*Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, 429 PC.

CLOSING STATEMENT

The cadets are better prepared to communicate using the standard radio phrases, priority of communications, emergency phrases and are able to conduct a radio check. The knowledge learned will ensure the cadets utilize the correct terminology and radio messages will be clear and concise.

INSTRUCTOR NOTES / REMARKS

If the squadron chooses to have cadets obtain the ROC-A, all complementary EOs for this PO must be instructed, and a qualified examiner must conduct 429 PC.

Cadets who are qualified Advanced Aviation may assist with this instruction.

REFERENCES

C3-116 ISBN 0-9680390-5-7 MacDonald, A.F., & Peppler, I.L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.

C3-182 *Study Guide for the Radiotelephone Operator's Restricted Certificate (Aeronautical)*. (1990). Retrieved October 23, 2007, from www.ic.gc.ca/epic/site/smt-gst.nsf/en/sf01397e.htm

Procedural Words and Phrases

Word or Phrase	Meaning
Acknowledge	Let me know that you have received and understood this message.
Affirmative	Yes, or permission granted.
Break	Indicates the separation between portions of the message. (To be used where there is no clear distinction between the text and other portions of the message.)
Confirm	My version is … Is that correct?
Correction	An error has been made in this transmission (message indicated). The correct version is ….
Do you read?	I have called you more than once. If you are receiving me, reply.
Go ahead	Self-explanatory.
How do you read?	Self-explanatory.
I say again	Self-explanatory (use instead of "I REPEAT").
Negative	No, or that is not correct, or I do not agree.
Out	Conversation is ended and no response is expected.
Over	My transmission is ended and I expect a response from you.
Read back	Repeat all of this message back to me exactly as received after I have given "OVER" (do not use the word "REPEAT").
Roger	I have received all of your last transmission.
Say again	Self-explanatory. (Do not use the word "REPEAT".)
Speak slower	Self-explanatory.
Stand by	I must pause for a few seconds or minutes, please wait.
That is correct	Self-explanatory.
Verify	Check coding, check text with originator and send correct version.
Wilco	Your instructions received, understood and will be complied with.

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Radio Activity

Send and receive the following message using the ITU phonetic alphabet and numbers.

Make a call sign for this exercise representing an aircraft, including:

- first name and age,
- C–G, and
- three letters.

Example call sign: DOUG 16 C–GABR (DOUG WUN SIX CHARLIE–GOLF ALPHA BRAVO ROMEO).

Make a call sign for this exercise representing the ground station, including:

- home community, and
- radio.

Example call sign: BROCKVILLE RADIO.

Radio Worksheet

Fill in the following sheet to assist with transmitting the message.

Cadet A (initial and age): _____ Aircraft: C–G

Cadet B (initial and age): _____ Aircraft: C–G

Call Sign (local community): _____ RADIO

After the initial call-up, stations do not have to repeat the words THIS IS and OVER.

Sending a Message

Call-up by aircraft:

_____ THIS IS _____ OVER.
Cadet B call sign Cadet A call sign

Reply by ground station:

_____ THIS IS _____ GO AHEAD, OVER.
Cadet A call sign Cadet B station

Message - aircraft:

_____ , _____ SIGNAL CHECK ON 5680.
Cadet B station Cadet A call sign

Message - ground station:

_____ , _____ READING YOU _____
Cadet A call sign Cadet B station (fill in response)

Acknowledgement - aircraft:

_____ , _____ ROGER, OUT.
Cadet B station Cadet A call sign

ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 3

EO C429.03 – DESCRIBE RADIO WAVELENGTHS, SIGNALS, LICENCES AND EQUIPMENT

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy the handouts located at Attachments A and C for each cadet.

Prepare slides located at Attachments B and D.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to orient the cadets to the topic of radio wavelengths, signals, licences, and equipment and to create interest in the subject.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall describe radio wavelengths, signals, licences and equipment.

IMPORTANCE

It is important for cadets to describe radio wavelengths, signals, licences and equipment as it helps them to better understand radio theory and licencing procedures. This information is required knowledge for the Industry Canada Restricted Operator Certificate with Aeronautical Qualification (ROC-A).

Teaching Point 1 **Describe radio wavelengths, frequencies and bands.**

Time: 5 min Method: Interactive Lecture

Distribute the handout located at Attachment A to each cadet. Cadets will label the handout as the information is presented.

CYCLE

Show the slide of Figure B-1 to the cadets.

When a pebble is dropped into water, waves are made. The waves decrease in height or strength as they travel away from the point of origin. The lengths of the waves never vary.

A radio transmitter sends out waves known as wavelengths. The linear measurement of the wave is measured in metres (m). A wavelength is the distance between two successive crests or two successive troughs.

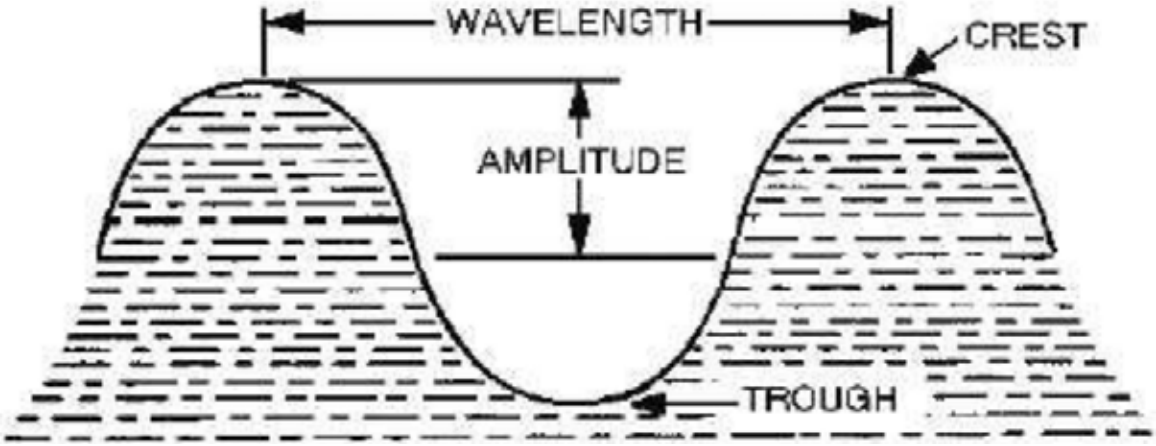

Figure 1 Wavelength

Note. From Integrated Publishing, *Transverse Wave*. Retrieved October 31, 2008, from http://www.tpub.com/content/neets/14182/css/14182_17.htm

Show the slide of Figure B-2 to the cadets.

Every crest (highest part of the wave) is separated by a trough (lowest part of the wave) to create an alternating pattern of crests and troughs known as cycles. A cycle is the period of time in which the wave vibrates up and down.

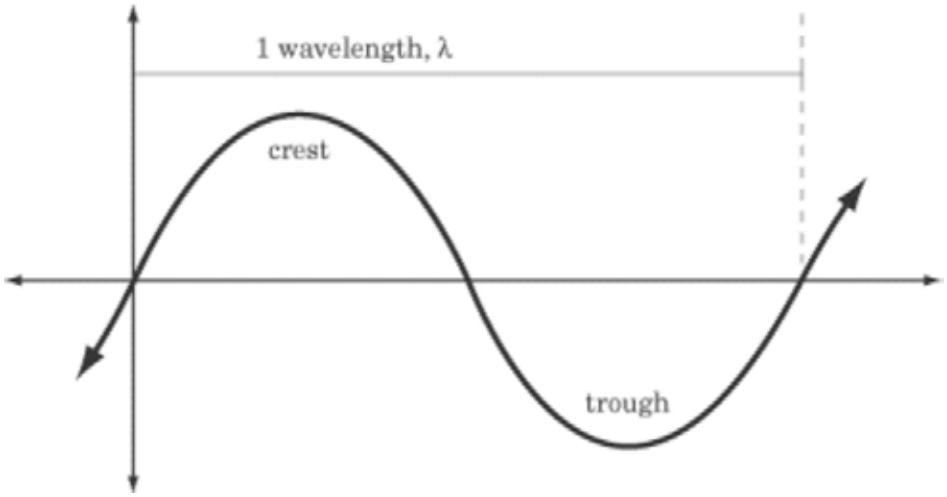

Figure 2 Crest and Trough

Note. From "SparkNotes", 2006, *Crests, Troughs, and Wavelength*. Retrieved October 24, 2008, from http://sparknotes.com/testprep/books/sat2/physics/chapter17section2.rhtml

The number of cycles per second is called frequency. The unit for frequency is the Hertz (Hz) where one Hz is equivalent to one cycle per second.

Show the slide of Figure B-3 to the cadets.

The lowest frequencies have the longest radio waves and the highest frequencies have the shortest radio waves.

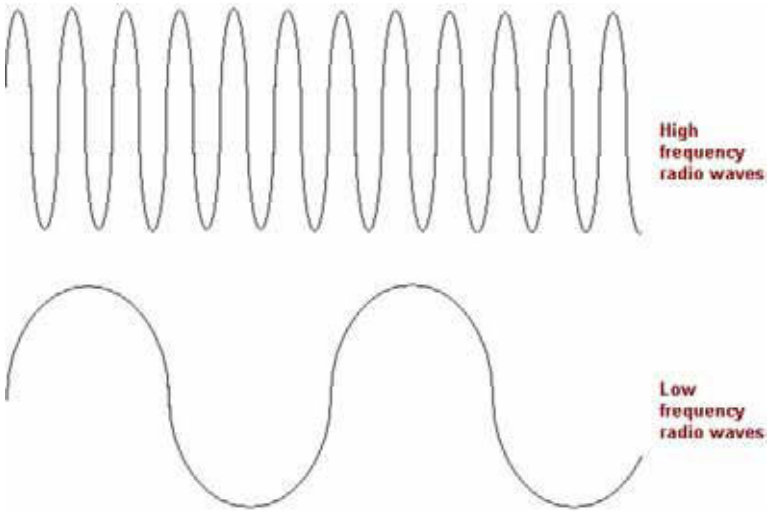

Figure 3 Radio Wave Frequencies

Note. From "Communications System", *What is Frequency?* Retrieved October 24, 2008, from http://qrg.northwestern.edu/project/vss/docs/Communications/1-what-is-frequency.html

KILOHERTZ

Very low to high frequencies are measured in kilohertz (kHz). kHz represents 1 000 waves passing a fixed point in one second.

MEGAHERTZ

Very high frequencies are measured in megahertz (MHz). MHz represents 1 000 kHz or 1 000 000 Hz passing a fixed point in one second.

The relationship between Hz, kHz and MHz can be explained as 1 000 000 Hz = 1 000 kHz = 1 MHz

LOW, MEDIUM, VERY HIGH, AND ULTRA HIGH FREQUENCY BANDS

Radio waves use the electromagnetic spectrum. The spectrum is divided into a number of frequency bands each possessing characteristics that determine the usage. Industry Canada, on behalf of the World Radio Communication Conference (WRC), allocates specific frequency bands to service domestic communication requirements.

Aviation radio communication facilities and radio navigation aids operate in different bands including:

- low frequency (LF),
- medium frequency (MF),
- high frequency (HF),
- very high frequency (VHF), and
- ultra high frequency (UHF).

Low Frequency (LF) Band

Non-directional and marker beacons transmit navigational signals as well as some voice transmissions in the 200–415 and 510–535 kHz band.

Medium Frequency (MF) Band

Commercial broadcasts can be used for directional bearings with automatic direction finding equipment in the 550–1 750 kHz band.

High Frequency (HF) Band

High frequencies are allocated in 100 kHz increments between 2 500–30 000 kHz. Numerous HF frequencies have been given to aviation. HF is excellent for air / ground communication. HF radio is the only way to maintain constant contact at ranges of 4 023 kilometres or more on transoceanic flights.

HF signals can be unpredictable, being affected by the day and night variations of the ionosphere as well as sunspots, auroras, etc.

HF stations in the upper range of HF bands get greater reception distance during daylight hours. Stations in the lower range get greater reception distance during the night.

Remember the mnemonic:

- sun up, frequency up, and
- sun down, frequency down.

Very High Frequency (VHF) Band

The most important band is between 30–300 MHz known as the VHF band. Certain ranges for frequencies have been allocated exclusively for aviation including:

- 108.00–117.98 MHz for navigational stations,
  - VHF omnidirectional range (VOR) stations,
  - instrument landing systems (ILS), and
  - voice reception;
- 118.00–136.00 MHz is allocated for civilian aviation voice communication, and
- 136.00–136.975 MHz is allocated for civilian aviation used mostly for air carriers for en route communication.

The most common VHF frequencies include:

- 121.50 MHz—universal VHF emergency,
- 122.20 MHz—flight service stations in Canada for both transmitting and receiving,
- 122.350–122.700 MHz—private advisory stations transmit and receive,
- 122.800 MHz—universal communications (UNICOM) facility is an air-to-ground communication facility operated by a private agency to provide private advisory station (PAS) service at uncontrolled airports,
- 122.90 MHz—used by aircraft engaged in various private aeronautical activities, such as:
  - parachute jumping,
  - aerial crop spraying, and
  - formation flying;
- 123.400 MHz—used for soaring activities, and
- 126.70 MHz—for transmitting position reports and general communication with a flight service station in uncontrolled airspace.

Ultra High Frequency (UHF) Band

Except for the glide slope portion of the instrument landing system (ILS) and distance measuring equipment (DME), the frequencies lying between 300–3 000 MHz are allocated for government use.

FREQUENCY ALLOCATION

With the numerous VHF channels in use and with changes occurring continuously, it is advisable to state the frequency on which the call is being made to any airway communication station, control tower or other facility.

VHF channels have been allotted for various aeronautical facilities under the Frequency Utilization Plan. Changes to the plan are made from time to time and published in Transport Canada (TC) Information Circulars.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What is a cycle?

Q2. What does one Hz equal?

Q3. Airway radio communication facilities and radio navigation aids operate in what bands?

ANTICIPATED ANSWERS:

A1. A cycle is the period of time in which the wave vibrates up and down.

A2. One Hz equals one cycle per second.

A3. Airway radio communication facilities and radio navigation aids operate in different bands including:

- low frequency (LF),
- medium frequency (MF),
- high frequency (HF),
- very high frequency (VHF), and
- ultra high frequency (UHF).

Teaching Point 2 **Describe characteristics of radio signals.**

Time: 5 min Method: Interactive Lecture

Radio waves travel both along the Earth and into the atmosphere. Each has characteristics that assist the transmission of the radio signal. Ground waves (surface waves) travel along the contour of the Earth by diffraction. Sky waves (spaces waves) can travel through the air directly to the receiving antenna or can be reflected from the ionosphere.

Distribute the handout located at Attachment C to each cadet. Cadets will label the handout as the information is presented.

Ground Waves

Show the slide of Figure D-1 to the cadets.

Ground waves travel by following the contours of the Earth. Travelling in straight lines, the wave will bend or curve, known as diffraction, around objects. As part of the ground wave comes in contact with the surface, it

loses some of its energy, weakening or attenuating the ground wave. This loss of energy causes a downward tilt which helps the wave follow the Earth's curvature.

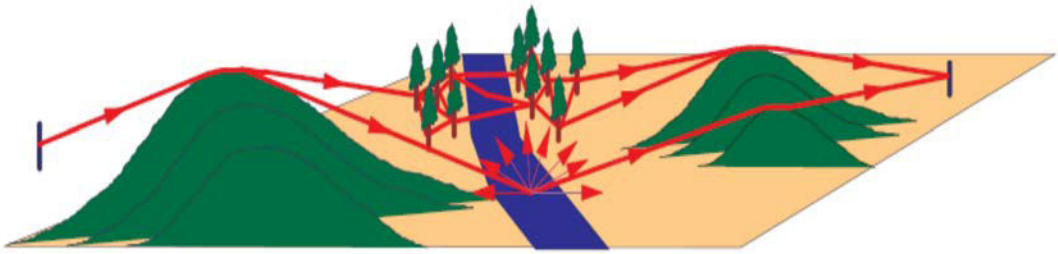

Figure 4 Ground Wave Transmission

Note. From Radio *Wave Diffraction and Scattering Models for Wireless Channel Simulation* (p. 5), by M. Casciato, 2001, Michigan: USA. Copyright 2001 by M. Casciato. Retrieved October 31, 2008, from http://www.eecs.umich.edu/RADLAB/html/NEWDISS/Casciato.pdf

Attenuation of the wave is affected by the nature of the surface. A radio wave will travel further over water, especially salty water, than land. Sand and ice cause poor conductivity compared to rich agricultural or marshy soil. Ground waves work best at lower frequencies.

Sky Waves

Show the slide of Figure D-2 to the cadets.

Transmission beyond the line of sight is possible through sky waves. Sky waves are radio waves that propagate into the atmosphere and bend back to the Earth from the ionosphere at some distance from the transmitter. Long-range communication is the result of sky wave transmission.

Two factors determine sky wave propagation: radio frequency and the level of ionization. Transmission of low, medium and high frequency radio waves vary by night and day. Sky waves travel at a flatter angle during the night. Sunspot activity or electromagnetic disturbances usually means more ionization of the ionosphere. HF communication is enhanced during times of greater sunspot activity.

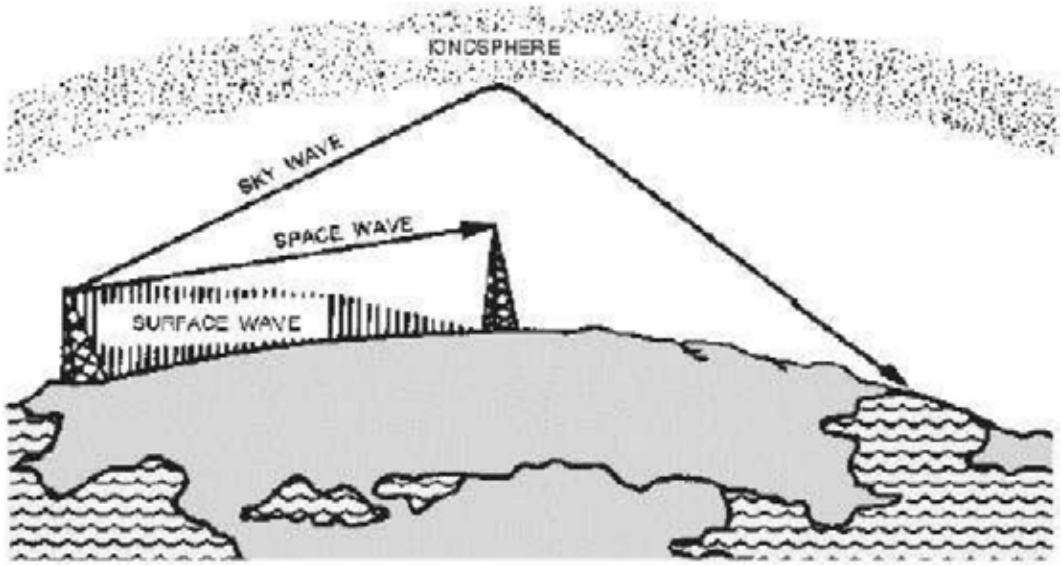

Figure 5 Sky Wave Transmission

Note. From "Integrated Publishing", *Radio Wave Transmission*. Retrieved October 31, 2008, from http://www.tpub.com/content/neets/14182/css/14182_75.htm

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CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What do ground waves follow?

Q2. What is attenuation?

Q3. From where does a sky wave reflect back to the Earth?

ANTICIPATED ANSWERS:

A1. The curvature of the Earth.

A2. The loss of energy when part of the ground wave comes in contact with the surface.

A3. The ionosphere.

Teaching Point 3 **Describe aeronautical terms and definitions.**

Time: 5 min Method: Interactive Lecture

AERONAUTICAL TERMS AND DEFINITIONS

Aerodrome. Defined as any area, land or water, including any building, installations, and equipment used for the arrival or departure, movement, and servicing of aircraft.

Aeronautical service. A radio communication service that provides for the safety, navigation, and other operations of an aircraft including the exchange of air-to-ground messages.

Aircraft station. A mobile station in the aeronautical service other than a survival craft, located on board an aircraft.

Aeronautical Operation Control Communications (AOCC). Communications related to the regularity of flight.

Aeronautical station. Location on land, on board a ship, or on a platform at sea receiving an aeronautical service. An aeronautical station may be as simple as a hand-held radio.

Air Traffic Control (ATC) Service. A service provided for the purpose of:

- preventing collisions between:
    - aircraft,
    - aircraft and obstructions, and
    - aircraft and vehicles on the manoeuvring area; and
- expediting and maintaining an orderly flow of air traffic.

Controlled aerodrome. An aerodrome at which an ATC service is provided.

Flight Service Station (FSS). A service providing mobile and fixed communications, airport advisory service (AAS), flight information, search and rescue alerting and weather and flight planning services to pilots and other users.

General Aviation Communication (GAC). Communication relating to all civil aviation operations other than for scheduled air service and non-scheduled air transport operations for hire, remuneration, or military aviation.

Ground control communication. ATC service communication provided for the purpose of:

- preventing collisions on the manoeuvring area between aircraft, aircraft and obstacles, or vehicles; and
- expediting and maintaining the orderly flow of aircraft operating on the manoeuvring area.

Private advisory service. A communication service offered at controlled aerodromes for use in connection with company business such as the servicing of aircraft, availability of fuel, lodging, etc.

Private multiple station. An aircraft or aeronautical station established to provide air-to-ground multi-purpose communication of an operational nature.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. What is an aircraft station?

Q2. What is an aeronautical station?

Q3. What is a controlled aerodrome?

ANTICIPATED ANSWERS:

A1. A mobile station in the aeronautical service other than a survival craft located on board an aircraft.

A2. A station located on land, on board a ship or on a platform at sea. It may be as simple as a hand-held radio.

A3. An aerodrome at which an ATC service is provided.

Teaching Point 4 **Describe radio station licences.**

Time: 5 min Method: Interactive Lecture

All radio stations in Canada must be licensed by Industry Canada. The licence specifies:

- call sign of the station,
- frequencies,
- special conditions,
- equipment, and
- fines.

Call Sign of the Station

A distinctive call sign is assigned to each radio station for identification purposes and should be used when initial contact is being established and again when the communication is concluded. Aeronautical call signs should always be pronounced phonetically.

Frequencies

The license will specify frequencies to be used for transmitting. The use of the frequency for activities includes:

- air-to-air,
- air-to-ground instructional, and
- air-to-ground aerodrome traffic communications.

Special Conditions

Each station receives conditions for operation, including: the tower size, interference, and special services.

Equipment

All radio equipment used in aeronautical services is required to be licensed by Industry Canada.

Fines

Any person who establishes a radio station without a radio authorization is liable to a fine not exceeding $5 000, or imprisonment for a term not exceeding one year, or both.

A corporation may receive a fine not exceeding $25 000.

CONFIRMATION OF TEACHING POINT 4

QUESTIONS:

Q1. Why is a call sign assigned?

Q2. What does the licence specify about frequencies?

Q3. What is required for all radio equipment used in aeronautical services?

ANTICIPATED ANSWERS:

A1. A call sign is assigned for identification.

A2. The licence specifies frequencies to be used for transmitting.

A3. All radio equipment used in aeronautical services is required to be licensed by Industry Canada.

Teaching Point 5 **Describe maintenance of equipment.**

Time: 5 min Method: Interactive Lecture

Avionics or radio equipment capable of two-way communication with ground stations or airborne stations include:

- a transceiver (transmitter and a receiver),
- a speaker (headset),
- a microphone, and
- antenna.

Equipment must be maintained and precautions need to be taken to ensure the serviceability of the avionics.

Transceiver (transmitter and a receiver)

A transmitter and a receiver are usually combined and called a transceiver. The transceiver should be warm but not hot to the touch. A cooling kit draws cool air from outside the airplane and pumps it around the equipment.

Headset (speaker)

The speaker(s) are included in the headset. The headset cables should not be knotted but coiled loosely when not being used.

Microphone and Antenna Connections

Microphone and antenna connections vary with the equipment. There should be no shorts or open wires when assembling connectors. Connections should be tight and clean. Where connections are exposed to the weather, they should be protected with a coating of silicone to prevent corrosion and to keep water from getting inside the outer casing of the cable.

Fuses

Electric circuits are protected against overload and short circuits by fuses, each rated for a given amperage. Fuses act as a safety valve. Fuses should never be replaced with one of a higher rating.

CONFIRMATION OF TEACHING POINT 5

QUESTIONS:

Q1. Why should radio equipment be maintained and precautions taken?

Q2. What precautions must be taken when assembling the microphone and antenna connections?

Q3. What is the function of a fuse?

ANTICIPATED ANSWERS:

A1. To ensure serviceability of the avionics.

A2. Ensure there are no shorts or open wires are present.

A3. Protects electric circuits against overload and short circuits.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. Name the three parts of a wavelength.

Q2. What two factors determine sky wave propagation?

Q3. What does Flight Service Station (FSS) provide?

ANTICIPATED ANSWERS:

A1. A wavelength consists of:

- amplitude,
- trough, and
- crest.

A2. Radio frequency and the level of ionization.

A3. FSS provides service to pilots and other users including:

- mobile and fixed communication,
- airport advisory,
- flight information,
- search and rescue alerting,
- weather, and
- flight planning.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001*Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, 429 PC.

CLOSING STATEMENT

Being able to describe radio wavelengths, signals, licences and equipment provides a better understanding of radio theory and licencing procedures. This knowledge is required to obtain the Industry Canada Restricted Operator Certificate with Aeronautical Qualification (ROC-A).

INSTRUCTOR NOTES / REMARKS

If the squadron chooses to have cadets obtain the ROC-A, all complementary EOs for this PO must be instructed and a qualified examiner must conduct the 429 PC.

Cadets who are qualified Advanced Aviation may assist with this instruction.

REFERENCES

C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Peppler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.

C3-182 *Study guide for the radiotelephone operator's restricted certificate (Aeronautical)*. (2008). Retrieved September 28, 2008, from www.ic.gc.ca/epic/site/smt-gst.nsf/en/sf01397e.html

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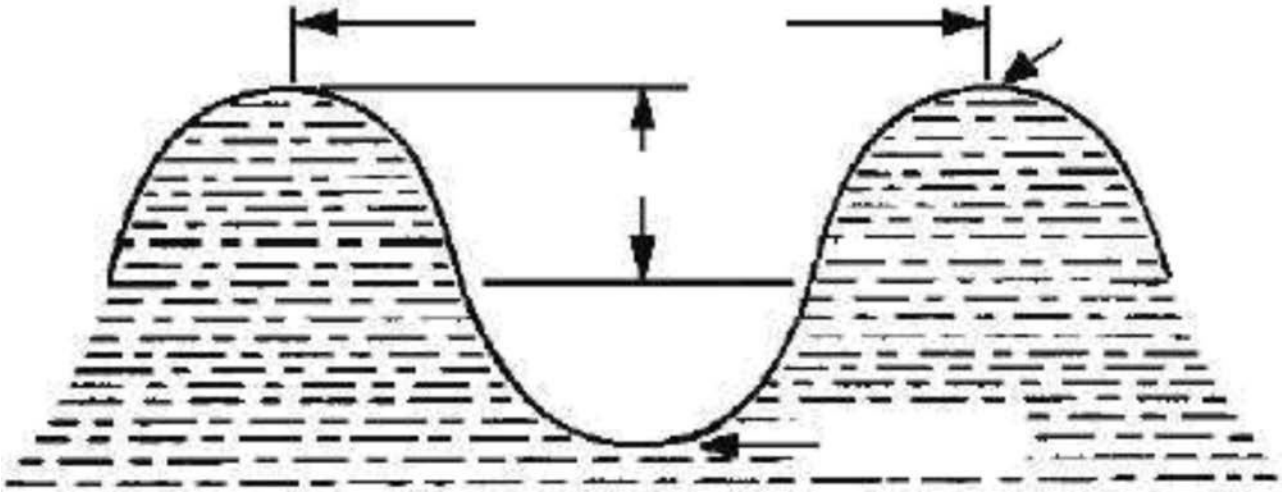

Figure A-1 Transverse Wavelength

Note. From Integrated Publishing, Transverse *Wave*. Retrieved October 31, 2008, from http://www.tpub.com/content/neets/14182/css/14182_17.htm

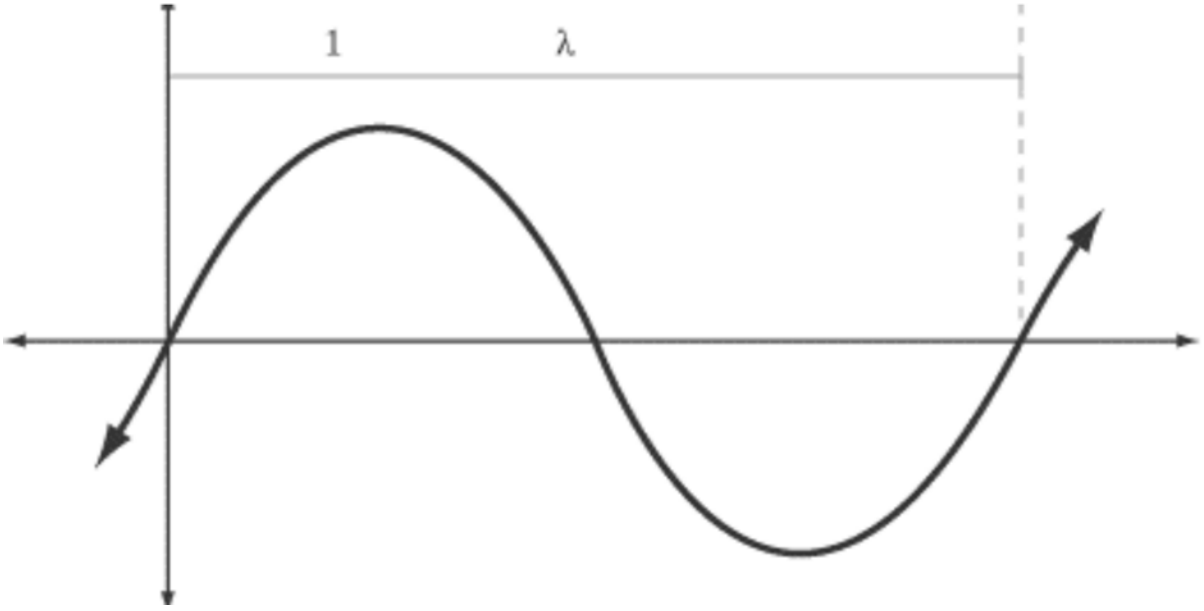

Figure A-2 Crest, Troughs and Trough

Note. From "SparkNotes", 2006, *Crests, Troughs, and Wavelength*. Retrieved October 24, 2008, from http://sparknotes.com/testprep/books/sat2/physics/chapter17section2.rhtml

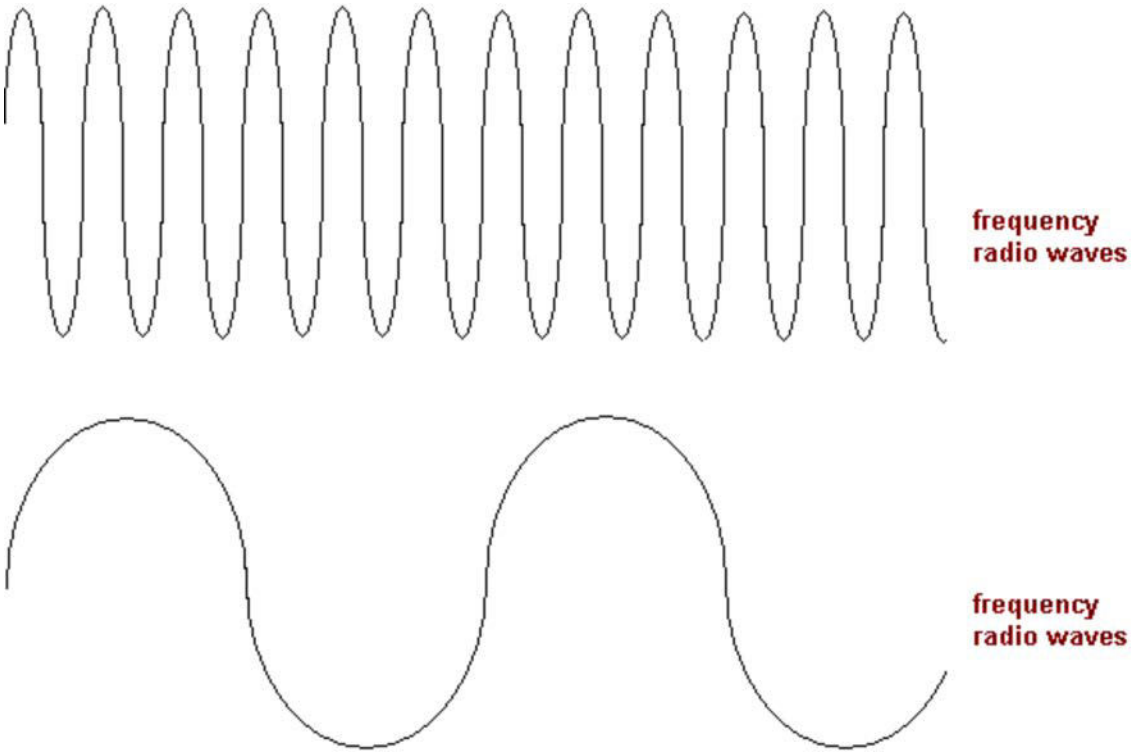

Figure A-3 Radio Wave Frequencies

Note. From "Communications System", *What is Frequency?* Retrieved October 24, 2008, from http://qrg.northwestern.edu/project/vss/docs/Communications/1-what-is-frequency.html

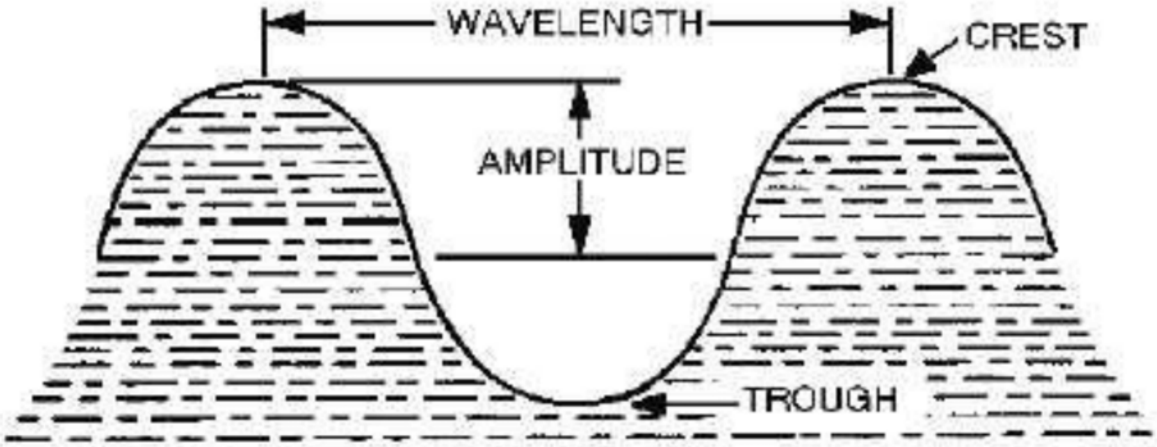

Figure B-1 Transverse Wavelength

Note. From Integrated Publishing, Transverse *Wave*. Retrieved October 31, 2008, from http://www.tpub.com/content/neets/14182/css/14182_17.htm

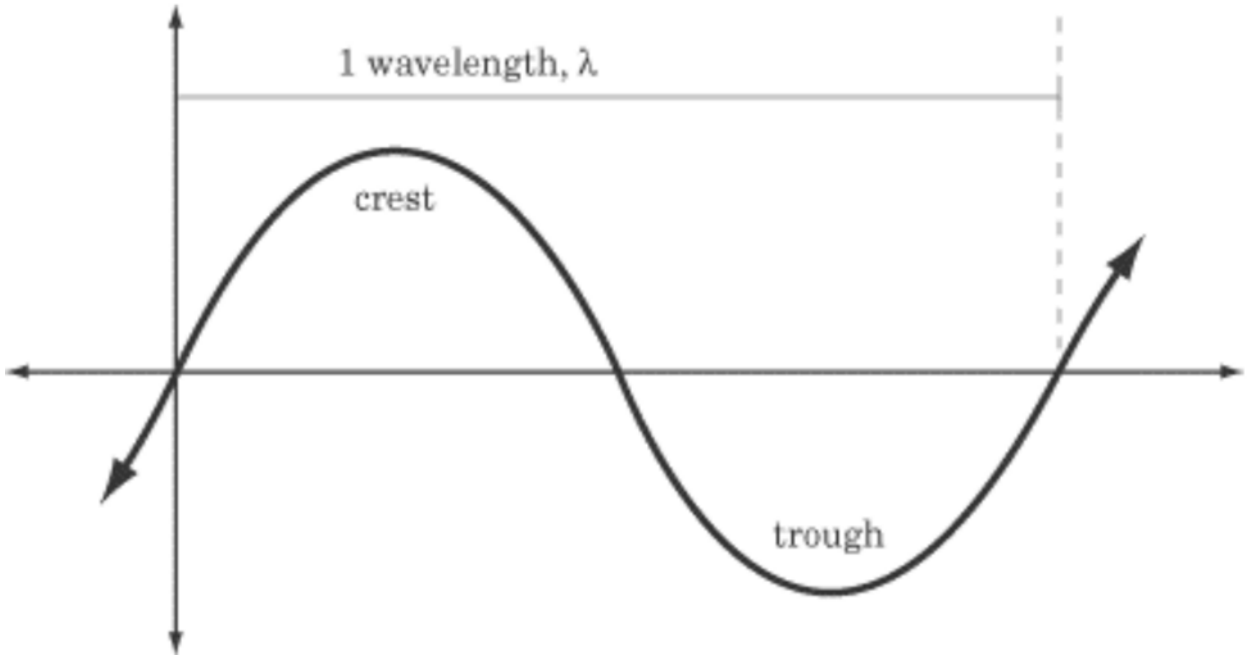

Figure B-2 Crest, Troughs and Trough

Note. From "SparkNotes", 2006, *Crests, Troughs, and Wavelength*. Retrieved October 24, 2008, from http://sparknotes.com/testprep/books/sat2/physics/chapter17section2.rhtml

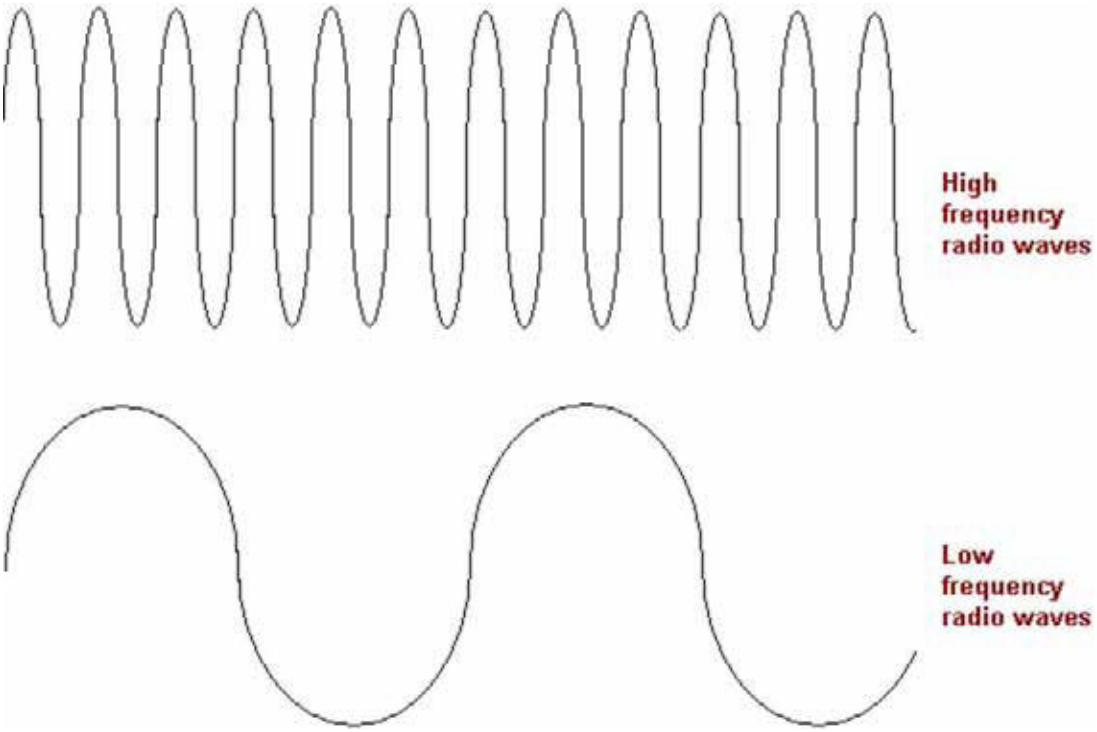

Figure B-3 Radio Wave Frequencies

Note. From "Communications System", *What is Frequency*? Retrieved October 24, 2008, from http://qrg.northwestern.edu/project/vss/docs/Communications/1-what-is-frequency.html

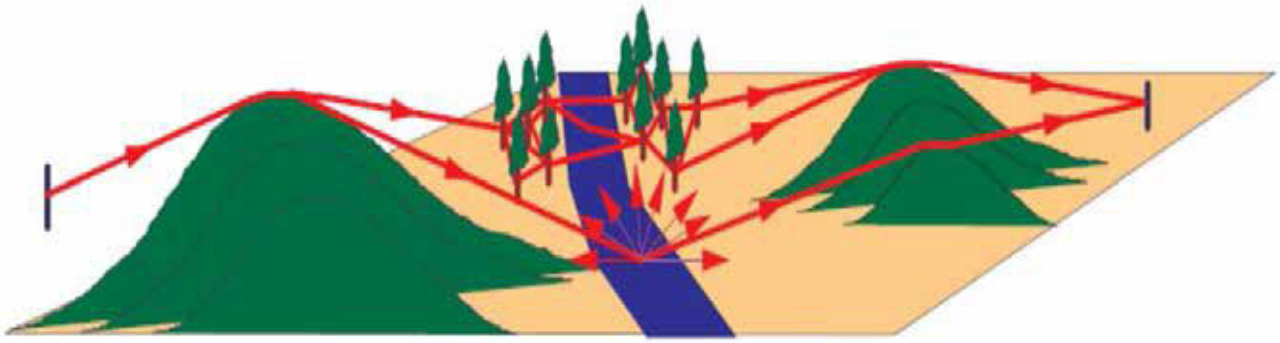

Figure C-1 Ground Wave Transmission

Note. From *Radio Wave Diffraction and Scattering Models for Wireless Channel Simulation* (p. 5), by M. Casciato, 2001, Michigan: USA. Copyright 2001 by M. Casciato. Retrieved October 31, 2008, from http://www.eecs.umich.edu/RADLAB/html/NEWDISS/Casciato.pdf

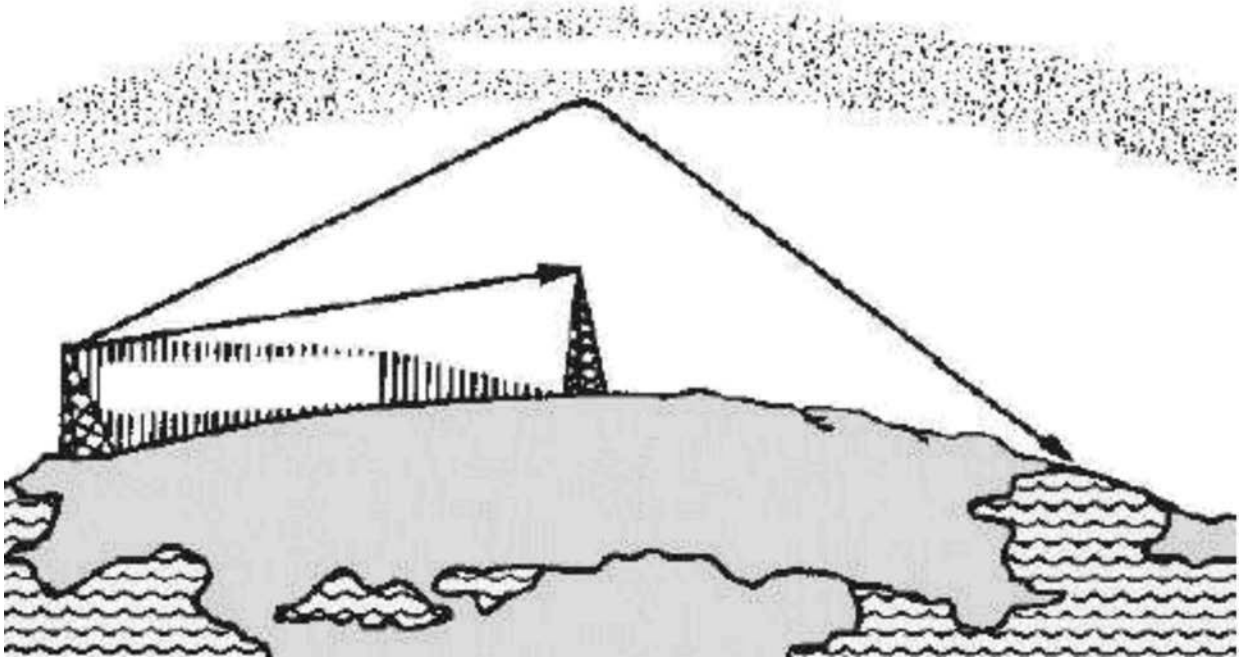

Figure C-2 Sky Wave Transmission

Note. From "Integrated Publishing", *Radio Wave Transmission*. Retrieved October 31, 2008, from http://www.tpub.com/content/neets/14182/css/14182_75.htm

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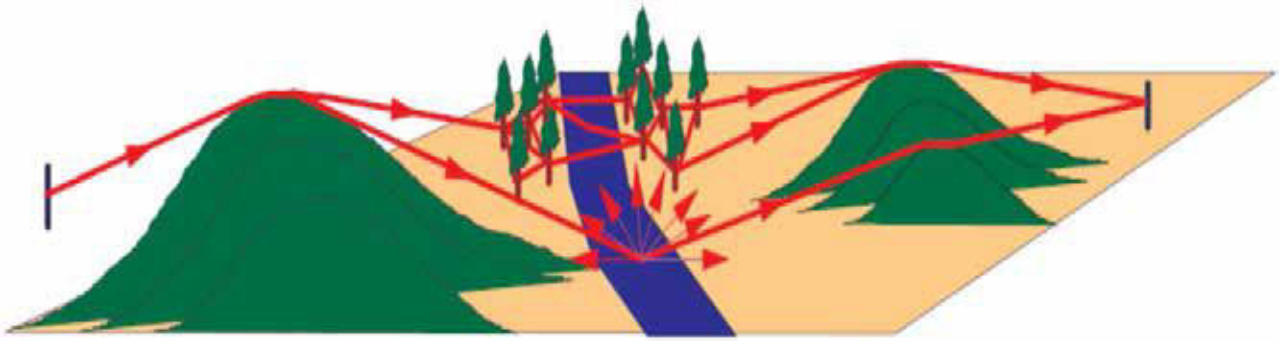

Figure D-1 Ground Wave Transmission

Note. From *Radio Wave Diffraction and Scattering Models for Wireless Channel Simulation* (p. 5), by M. Casciato, 2001, Michigan: USA. Copyright 2001 by M. Casciato. Retrieved October 31, 2008, from http://www.eecs.umich.edu/RADLAB/html/NEWDISS/Casciato.pdf

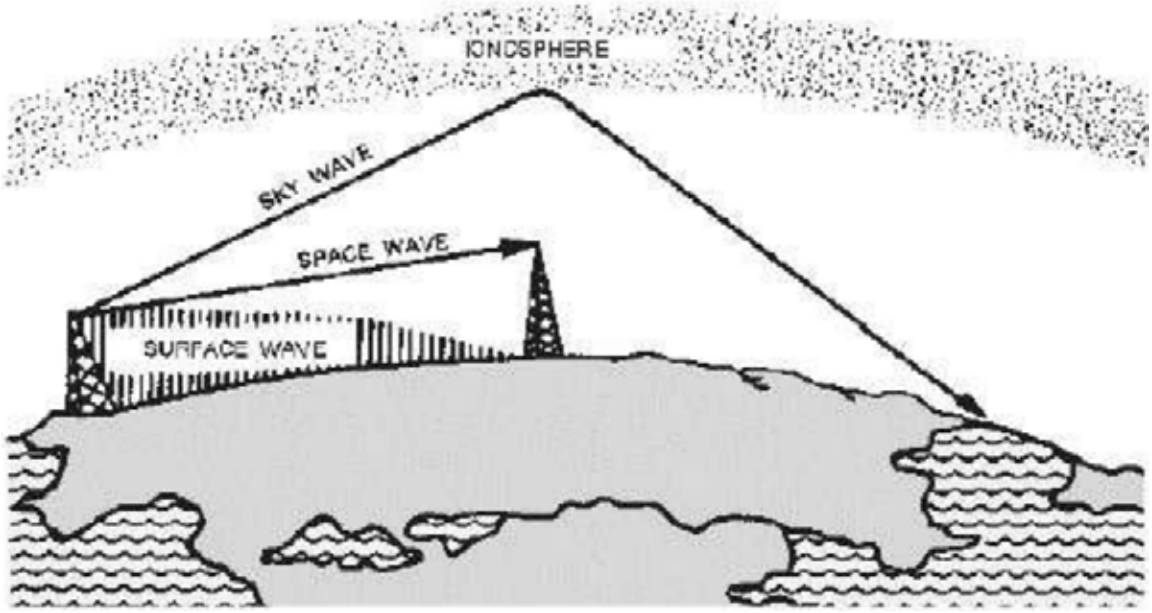

Figure D-2 Sky Wave Transmission

Note. From "Integrated Publishing", *Radio Wave Transmission*. Retrieved October 31, 2008, from http://www.tpub.com/content/neets/14182/css/14182_75.htm

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ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 4

EO C429.04 – EXPLAIN EMERGENCY, URGENCY AND SAFETY COMMUNICATIONS

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to clarify, emphasize, and summarize emergency, urgency and safety communications.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have explained emergency, urgency and safety communications.

IMPORTANCE

It is important for cadets to explain emergency, urgency and safety communications as the information is recognized worldwide to request assistance. The information is required knowledge to obtain the Industry Canada Restricted Operator Certificate with Aeronautical Qualification (ROC-A).

Teaching Point 1 **Explain emergency communications.**

Time: 15 min Method: Interactive Lecture

EMERGENCY COMMUNICATIONS

Distress Call

A distress call is defined as a situation of serious and / or imminent danger that requires immediate assistance. A distress call is sent by saying:

1. MAYDAY spoken three times,
2. THIS IS, and
3. the call sign of the aircraft in distress spoken three times.

Distress situations include:

- fire,
- engine failure, and
- explosive decompression.

Example:

MAYDAY, MAYDAY, MAYDAY,
THIS IS,
PIPER FOXTROT ALFA BRAVO CHARLIE,
PIPER FOXTROT ALFA BRAVO CHARLIE,
PIPER FOXTROT ALFA BRAVO CHARLIE.

Priority

A distress call has absolute priority over all other transmissions.

Frequencies to Use

The initial distress call should be made on the air-to-ground frequency that is in use at the time. If the station in distress cannot make contact on the initial air-to-ground frequency, attempt to make contact on the general distress frequency (121.50 MHz, 243 MHz or 3023.5 kHz) and then any other frequency that is available. If changing frequency, state which frequency is being changed to before leaving the first frequency.

Distress Message

The distress message shall follow the distress call as soon as possible. The message shall include as much information as possible, in the following order:

1. the distress signal MAYDAY once,
2. the call sign of the aircraft in distress once,
3. the nature of the distress condition and what assistance is required,
4. the intentions of the person in command,
5. the aircraft details including its position, airspeed, altitude, and heading,

6. the number of people on board and any injuries,

7. any other information which might assist the rescue, and

8. the call sign of the aircraft in distress.

Example:

MAYDAY,
PIPER FOXTROT ALFA BRAVO CHARLIE,
STRUCK BY LIGHTNING,
DITCHING AIRCRAFT,
POSITION: 20 MILES EAST OF WINNIPEG,
ALTITUDE: WUN TOUSAND FIFE ZERO ZERO FEET,
AIRSPEED: WUN TOO FIFE KNOTS,
HEADING: TOO SEVEN ZERO DEGREES,
ONE PERSON ON BOARD,
PIPER FOXTROT ALFA BRAVO CHARLIE.

Repetition of Distress Message

The distress message shall be repeated at intervals by the aircraft in distress until an answer is received or until it is no longer safe / possible to continue sending the message.

Action by Station in Distress

A person in command of an aircraft in distress shall direct the following actions:

1. transmit the distress call;

2. transmit the distress message;

3. listen for acknowledgement of message receipt;

4. exchange further distress information as applicable; and

5. activate automatic emergency equipment (eg, emergency locator transmitter [ELT]) if available and when appropriate.

Action by Stations Other Than the Station in Distress

An aircraft that is not in distress shall transmit the distress message when:

1. the aircraft in distress is not in a position to transmit the message;

2. the person in command of the aircraft not in distress believes that further help is necessary; and

3. the aircraft heard a distress message that has not been acknowledged.

When a distress message has been heard and the aircraft in distress is not in the immediate vicinity, allow time for stations nearer to the aircraft in distress to reply.

Stations hearing a distress message shall:

- continue to monitor the frequency on which the distress message was received;
- establish a continuous watch on appropriate distress and emergency frequencies;

- notify stations with direction finding or radar facilities and request assistance unless it is known that the action has been taken by the station acknowledging receipt of the distress message; and
- cease transmissions which interfere with the distress traffic.

Distress Traffic

Distress traffic is all transmissions relative to the immediate assistance required by the station in distress including all transmissions after the initial distress call.

The distress signal MAYDAY spoken once shall precede all distress traffic.

For stations not aware of the distress call, starting the message with the word MAYDAY will alert the stations of a distress situation. All stations will monitor the distress channel on which the distress call originated.

Any aircraft that has knowledge of the distress traffic and cannot assist the station in distress shall follow the traffic until it is evident that assistance is being provided.

All stations that are aware of the distress traffic and are not participating in the traffic are forbidden to transmit on the frequencies.

Communication can continue once a message has been received indicating that normal working traffic has resumed.

Acknowledgement of Receipt of a Distress Message

A station responding to a distress message shall acknowledge the message in the following form:

1. the distress signal MAYDAY;
2. the call sign of the station in distress spoken three times;
3. the phrase THIS IS;
4. the call sign of the station acknowledging receipt spoken three times; and
5. the words RECEIVED MAYDAY.

Example:

MAYDAY, MAYDAY, MAYDAY,
PIPER FOXTROT ALFA BRAVO CHARLIE,
PIPER FOXTROT ALFA BRAVO CHARLIE,
PIPER FOXTROT ALFA BRAVO CHARLIE,
THIS IS,
WINNIPEG TOWER,
WINNIPEG TOWER,
WINNIPEG TOWER,
RECEIVED MAYDAY.

Action by Stations Acknowledging Receipt of a Distress Message

Once the station has acknowledged the distress message, the station shall take the following actions:

1. taking control of the communications or clearly transferring the responsibility and informing the aircraft if a transfer is made;
2. taking immediate action to ensure all necessary information is provided as soon as possible to the air traffic service (ATS) unit concerned and the aircraft operating agency or representative concerned;
3. continuing to monitor the frequency on which the distress message was received and if possible any other frequency that may be used by the aircraft in distress;
4. warning other stations in order to prevent the transfer of aeronautical traffic to the frequency or the distress communication; and
5. ceasing all transmissions that may interfere with the distress traffic.

Relay of a Distress Message

If a distress message is repeated by an aircraft or station other than the aircraft in distress, the message will be comprised of:

- the signal MAYDAY RELAY spoken three times;
- the phrase THIS IS;
- the call sign of the station relaying the message spoken three times;
- the distress signal MAYDAY spoken once; and
- the details of the aircraft in distress, to include:
    - the call sign of the aircraft in distress spoken once;
    - the nature of the distress;
    - the action being taken;
    - its location;
    - the number of people on board; and
    - the call sign of the aircraft in distress spoken once.

Example:

MAYDAY RELAY, MAYDAY RELAY, MAYDAY RELAY,
THIS IS,
CESSNA GOLF SIERRA ROMEO TANGO,
CESSNA GOLF SIERRA ROMEO TANGO,
CESSNA GOLF SIERRA ROMEO TANGO,
MAYDAY,
PIPER FOXTROT ALFA BRAVO CHARLIE,
STRUCK BY LIGHTNING,
FORCED LANDING AIRCRAFT,
POSITION: 20 MILES EAST OF WINNIPEG,
ALTITUDE: WUN TOUSAND FIFE ZERO ZERO FEET,
AIRSPEED: WUN TOO FIFE KNOTS,
HEADING: TOO SEVEN ZERO DEGREES,
ONE PERSON ON BOARD,
PIPER FOXTROT ALFA BRAVO CHARLIE.

Imposition of Silence

Silence shall be imposed on all stations or individual stations in the area that are interfering with the distress traffic. The aircraft in distress or the station in control of distress traffic shall use the expression SEELONCE MAYDAY. Other stations near the aircraft in distress may impose silence during a distress situation by using the international expression SEELONCE DISTRESS.

All transmissions will cease immediately except for those involved in the distress traffic.

Example:

The aircraft in distress imposing silence to a specific station:	CHEROKEE GOLF OSCAR OSCAR PAPA, THIS IS, PIPER FOXTROT ALFA BRAVO CHARLIE, SEELONCE MAYDAY, OUT.
A station other than the aircraft in distress imposing silence to all stations:	ALL STATIONS, ALL STATIONS, ALL STATIONS, THIS IS, CHEROKEE GOLF OSCAR OSCAR PAPA, SEELONCE DISTRESS, OUT.

Cancellation of Distress

When the distress situation or when radio silence has ended, the station controlling the distress traffic shall transmit a message addressed to all stations on all frequencies used, advising that normal communication may resume. The message cancelling the distress message includes:

1. the distress signal MAYDAY spoken once;
2. the phrase HELLO ALL STATIONS spoken three times;
3. the phrase THIS IS;
4. the call sign of the station transmitting the message;
5. the filing time of the message;

6. the call sign of the station in distress spoken once;

7. the words SEELONCE FEENEE; and

8. the word OUT.

Example:

MAYDAY,
HELLO ALL STATIONS, HELLO ALL STATIONS, HELLO ALL STATIONS,
THIS IS,
WINNIPEG TOWER,
TIME WUN SIX TREE ZERO ZULU,
PIPER FOXTROT ALPHA BRAVO CHARLIE,
SEELONCE FEENEE,
OUT.

Ensure that search and rescue stations are advised that a station is no longer in distress by making a normal call to the nearest aeronautical station detailing the reasons for cancelling the distress call.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. Define a distress call.

Q2. What is included in a distress call?

Q3. What words are used to impose silence by the aircraft in distress?

ANTICIPATED ANSWERS:

A1. A situation of serious and / or imminent danger that requires immediate assistance.

A2. A distress call includes:

- MAYDAY spoken three times,
- THIS IS, and
- call sign of aircraft in distress spoken three times.

A3. SEELONCE MAYDAY.

Teaching Point 2 **Explain urgency and safety communications.**

Time: 10 min Method: Interactive Lecture

URGENCY AND SAFETY COMMUNICATIONS

Urgency Call

An urgency call is defined as a message from a station having a very urgent transmission but does not require immediate assistance, concerning the safety of:

- an aircraft, ship, or other vehicle, and
- a person.

The urgency call shall only be sent on the authority of the person in charge including situations involving:

- being lost;
- minor mechanical problems;
- serious health issues involving an individual on board; and
- security issues involving an individual on board.

The urgency call is sent using the words PAN PAN spoken three times at the beginning of the first urgency communication.

Priority

An urgency call has priority over all other transmissions except emergency (distress) calls.

All stations that hear the urgency call shall continue to listen for at least three minutes on the frequency which the signal was heard. After three minutes, and if no further message is heard, all stations can resume communications as normal.

Stations that are in communication on frequencies other than those used for the transmission of the urgency message may continue normal work without interruption unless the urgency message is addressed to all stations.

Frequencies to Use

The initial urgency call and message should be made on the air-to-ground frequency that is in use at the time. If the station in difficulty cannot make contact on the initial air-to-ground frequency, it shall attempt to make contact on the general aeronautical emergency frequency (121.50 MHz or 3023.5 kHz) or any frequency that is available to make contact with any aeronautical ground or aircraft station.

Urgency Message

The urgency call shall be followed by the urgency message. The message shall include further information including as many as possible, in the following order:

1. the urgency call PAN PAN spoken three times;
2. the call sign of the aircraft, station, or ALL STATIONS spoken three times;

3. the phrase THIS IS;
4. the call sign of the aircraft or station making the urgency call;
5. the nature of the urgency condition;
6. the intentions of the person in command;
7. the aircraft particulars of its position (airspeed, altitude, and heading);
8. any other useful information;
9. the call sign of the aircraft in distress; and
10. the word OVER.

Example:

PAN PAN, PAN PAN, PAN PAN,
ALL STATIONS, ALL STATIONS, ALL STATIONS,
THIS IS,
PIPER FOXTROT ALFA BRAVO CHARLIE,
LOST, REQUEST RADAR CHECK,
POSITION: UNKNOWN,
ALTITUDE: WUN TOUSAND FIFE HUNDRED FEET,
AIRSPEED: WUN TOO FIFE KNOTS,
HEADING: TOO SEVEN ZERO DEGREES,
PIPER FOXTROT ALFA BRAVO CHARLIE,
OVER.

Reply to Urgency Message

When the urgency message is addressed to all stations and is acknowledged by another aircraft or station, the acknowledging station shall forward the urgency information to the appropriate authorities.

Example:

PAN PAN,
PIPER FOXTROT ALFA BRAVO CHARLIE,
THIS IS WINNIPEG TOWER,
YOUR POSITION IS 28 MILES EAST WINNIPEG,
WINNIPEG TOWER,
STANDING BY.

Cancellation of Urgency Message

As soon as it is known that the action is no longer necessary, the cancellation message shall be directed to ALL STATIONS by the station responsible for the urgency message transmission.

Example:

PAN PAN,
HELLO ALL STATIONS, HELLO ALL STATIONS, HELLO ALL STATIONS,
THIS IS,
PIPER FOXTROT ALFA BRAVO CHARLIE,
PIPER FOXTROT ALFA BRAVO CHARLIE,
PIPER FOXTROT ALFA BRAVO CHARLIE,
28 MILES EAST OF WINNIPEG AIRPORT PROCEEDING NORMALLY,
PIPER FOXTROT ALFA BRAVO CHARLIE,
OUT.

Safety Signal

Aircraft or stations transmitting the safety signal SECURITE will then transmit a message to aircraft in flight, concerning:

- the safety of navigation, or
- important meteorological warnings.

The safety signal has priority over all communications except distress and urgency.

The safety signal SECURITE is spoken three times at the start of the message addressed to ALL STATIONS.

Example:

SECURITE, SECURITE, SECURITE,
ALL STATIONS, ALL STATIONS, ALL STATIONS,
THIS IS,
PIPER FOXTROT NOVEMBER KILO ECHO,
NOTICE TO ALL STATIONS IN AREA,
30 MILES EAST OF OTTAWA,
UNMANNED BALLOON DRIFTING,
PIPER FOXTROT NOVEMBER KILO ECHO,
OUT.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. Define an urgency call.

Q2. What word is repeated three times for an urgency call?

Q3. What word is repeated three times for the safety signal?

ANTICIPATED ANSWERS:

A1. A message from a station having a very urgent transmission but does not require immediate assistance, concerning the safety of:

- an aircraft, ship, or other vehicle, and
- a person.

A2. PAN PAN.

A3. SECURITE.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. What calls have absolute priority over all other communication?

Q2. On what frequency should the initial distress call be made?

Q3. To whom is the cancellation message directed?

ANTICIPATED ANSWERS:

A1. Distress.

A2. The air-to-ground frequency being used at the time.

A3. ALL STATIONS.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001*Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, 429 PC.

CLOSING STATEMENT

The ability to explain emergency, urgency and safety communications demonstrates the cadets understanding of the worldwide request for assistance. This knowledge is required to obtain the IC ROC-A.

INSTRUCTOR NOTES / REMARKS

If the squadron chooses to have cadets obtain the ROC-A, all complementary EOs must be conducted and a qualified examiner must conduct the 429 PC

Cadets who are qualified Advanced Aviation may assist with this instruction.

REFERENCES

C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Peppler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.

C3-182 *Study Guide for the Radiotelephone Operator's Restricted Certificate (Aeronautical)*. (2008). Retrieved September 28, 2008, from www.ic.gc.ca/epic/site/smt-gst.nsf/en/sf01397e.htm

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ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 1

EO M431.01 – EXPLAIN FEATURES OF WING DESIGN

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Obtain a model of a light fixed-wing aircraft with wing struts, fixed gear and control surface detail.

Prepare slides of the figures located at Attachment A.

Obtain a model of a wing.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to clarify, emphasize, and summarize features of wing design.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to explain features of wing design.

IMPORTANCE

It is important for cadets to be able to explain features of wing design as it directly relates to the production of lift by the wing. Being able to explain features of wing design provides knowledge for potential instructional duties and is part of the fundamentals that cadets pursuing future aviation training will require.

Use the model aircraft with articulated control surfaces and flaps throughout this lesson to illustrate features of wing design as they are discussed.

Teaching Point 1 **Explain airfoils.**

Time: 10 min Method: Interactive Lecture

AIRFOILS

Chord. An imaginary straight line joining the leading and trailing edges of the wing. The mean aerodynamic chord (MAC) is the average chord of the wing.

The shape and design of the wing is directly influenced by the intended purpose of the aircraft. Aircraft designed to fly slowly typically have thick airfoils, while aircraft designed to fly fast have thin airfoils.

Show the slide of Figure A-1 to the cadets.

The very thin layer of air lying over the surface of the wing is called the boundary layer. At the front of the wing, the boundary layer flows smoothly over the surface and this area is called the laminar layer. As the air flows further along the wing, it slows down due to skin friction, the layer becomes thicker, and it becomes turbulent. The turbulent area is called the turbulent layer.

The transition point between the laminar and turbulent areas tends to move forward as airspeed and the angle of attack increase.

Conventional Airfoils

Conventional airfoils generally are the thickest at 25 percent of the chord and can be found in a variety of shapes and designs.

Show the slide of Figure A-2 to the cadets and describe the different airfoil shapes.

Laminar Flow Airfoils

Show the slide of Figure A-3 to the cadets and show the differences between conventional and laminar flow airfoil shapes.

Laminar flow airfoils have their thickest point at 50 percent of the chord, a leading edge that is more pointed and upper and lower surfaces that are nearly symmetrical. Originally developed to make aircraft fly faster, they can be found on many different aircraft types.

The design of the laminar flow airfoil reduces drag by maintaining the laminar flow of air throughout a greater percentage of the chord. The pressure distribution is more even, but the transition point moves forward more rapidly near the point of stall.

Planform

Show the slide of Figure A-4 to the cadets.

The shape of the wing as seen from directly above is called the planform. The three general wing shapes are:

- rectangular,
- elliptical (rounded), and
- delta (swept).

Aspect ratio. The relationship between the length of the wing and its width (chord). It is calculated by dividing the span by the average chord.

A wing with a high aspect ratio generates more lift with less induced drag than a wing with the same wing area and a low aspect ratio. High aspect ratio wings are commonly found on gliders.

Angle of Incidence

Show the slide of Figure A-5 to the cadets.

The angle of incidence is the angle at which the wing is permanently inclined to the longitudinal axis of the aircraft.

The angle of incidence affects the following items:

- flight visibility,
- takeoff and landing characteristics, and
- amount of drag in level flight.

Wash-Out and Wash-In

To reduce the tendency of the wing to stall suddenly, the wing can be designed so that the angle of incidence at the wing tip is different than the angle of incidence at the wing root.

Show the slide of Figure A-6 to the cadets.

The twist in the wing causes the tip and root to stall at slightly different angles of attack and improves the stall characteristics. If the wing root stalls before the wing tip, the ailerons, located closer to the wing tip, can still be effective during the early part of the stall.

Decreasing the angle of incidence at the wing tip is called wash-out and increasing the angle is called wash-in.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What happens to the transition point as airspeed and angle of attack increase?

Q2. What is the aspect ratio of a wing?

Q3. What is it called when the angle of incidence at the wing tip is decreased?

ANTICIPATED ANSWERS:

A1. The transition point moves forward.

A2. The relationship between the length of the wing and its width (chord). It is computed by dividing the span by the average chord.

A3. Wash-out.

Teaching Point 2 **Explain high-lift devices.**

Time: 10 min Method: Interactive Lecture

HIGH-LIFT DEVICES

The efficiency of a wing can be improved by either increasing the amount of lift generated, or by decreasing the amount of induced drag created. High-lift devices can be used individually or in various combinations to create a very efficient wing.

Although great gains in efficiency can be realized by adding these devices to a wing, there are penalties to pay, such as increased weight and increased mechanical complexity.

Wing Tip Design

Induced drag can be reduced by limiting the formation of wing tip vortices. This is done by preventing air from spilling over the wing tip by modifying the wing tips in one of the following ways:

- installing wing tip fuel tanks,
- using wing tip plates or winglets, and
- drooping the wing tips.

Show Figures A-7 and A-8 to the cadets.

Wing Fences

Show the slide of Figure A-9 to the cadets. Wing fences can also be seen in Figure A-8.

Wing fences are vertical surfaces attached to the upper surface of the wing. They act as guides and control the direction of airflow over the wing, especially at high angles of attack. This improves low-speed handling and stall characteristics.

Slats

Show the slide of Figure A-10 to the cadets.

Auxiliary airfoils that automatically move out in front of the leading edge at high angles of attack are known as slats. The resulting opening changes the airflow over the leading edge, smoothing out eddies that form on the top of the wing.

Slots

Show the slide of Figure A-11 to the cadets. Slots can also be seen in Figure A-10.

Slots affect the airflow in the same way as slats, except that they are passageways built into the wing. Slots can either be full- or partial-span.

Slats are moving devices. Slots are built into the wing and do not move.

Flaps

The most common high-lift device found on a wing is the flap. Located at the trailing edge, their primary purpose is to increase lift by changing the camber of the wing. Some styles of flaps also increase the effective wing area. The increased lift causes a lower stall speed and allows the aircraft to approach at a slower airspeed.

Show the slide of Figure A-12 to the cadets.

With a small amount of flap deflection, the amount of extra lift produced is greater than the amount of extra drag. As the amount of deflection increases, the amount of extra drag catches up to and passes the amount of extra lift being generated. The extra drag produced can be used to improve landing capabilities by slowing the aircraft down and creating a steeper approach angle (useful in approaching a runway with obstacles near the threshold).

Show the slide of Figure A-13 to the cadets.

Generally, the amount of drag produced by flaps reduces acceleration to the point where flaps should not be deployed during takeoff (as is the case with plain and split flaps). Slotted, Zap, and Fowler flaps produce more lift than drag at small amounts of deflection (5–15 degrees) and are usually recommended for takeoff.

In some aircraft, landing with full flaps and a crosswind is not recommended as the flaps may disrupt the airflow over the tail surfaces and make it difficult to control the aircraft during the ground roll.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. How can induced drag be reduced by wing tip design?

Q2. What is the main difference between slats and slots?

Q3. What do flaps increase?

ANTICIPATED ANSWERS:

A1. Induced drag can be reduced by:

- installing wing tip fuel tanks,
- using wing tip plates or winglets, and
- drooping the wing tips.

A2. Slats are moving devices. Slots are built into the wing and do not move.

A3. Flaps increase lift and drag. They may also increase the effective wing area.

Teaching Point 3 **Explain spoilers and speed brakes.**

Time: 5 min Method: Interactive Lecture

Show the slide of Figure A-14 to the cadets.

SPOILERS

Spoilers are devices on a wing that are used to decrease the lift and increase the drag being produced. They work by being extended up from the top surface of the wing and disrupting the airflow. Spoilers are found on almost all types of gliders and are used to increase the rate of descent during the landing approach.

Spoilers can also be used to supplement aileron control or replace ailerons completely. A deployed spoiler has the same effect as an up-going aileron, causing the aircraft to bank to that side.

SPEED BRAKES

Speed (dive) brakes are devices that are extended into the airflow, creating drag, with minimal effect on the lift being produced. Speed brakes allow aircraft to slow down without reducing thrust, and to control approach angles.

Speed brakes may be plates that extend out of a wing or hinged doors that open out from the fuselage.

Most gliders have speed brakes that extend out of the bottom of the wing.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. Where are spoilers located?

Q2. What control surface can spoilers supplement or replace?

Q3. What do speed brakes create?

ANTICIPATED ANSWERS:

A1. On the top surface of a wing.

A2. Ailerons.

A3. Drag.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. What is the chord?

Q2. How can adding devices negatively affect a wing?

Q3. What do spoilers increase during the landing approach of most gliders?

ANTICIPATED ANSWERS:

A1. An imaginary straight line joining the leading and trailing edges of the wing.

A2. They create increased weight and mechanical complexity.

A3. The rate of descent.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW A-CRR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, Aviation Subjects–Combined Assessment PC.

CLOSING STATEMENT

Understanding wing design, the features that improve the efficiency of the wing and devices that produce drag to control the approach angle provides knowledge for potential instructional duties and is part of the fundamentals that cadets pursing future aviation training will require.

INSTRUCTOR NOTES / REMARKS

Cadets who are qualified Advanced Aviation may assist with this instruction.

REFERENCES

C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Peppler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.

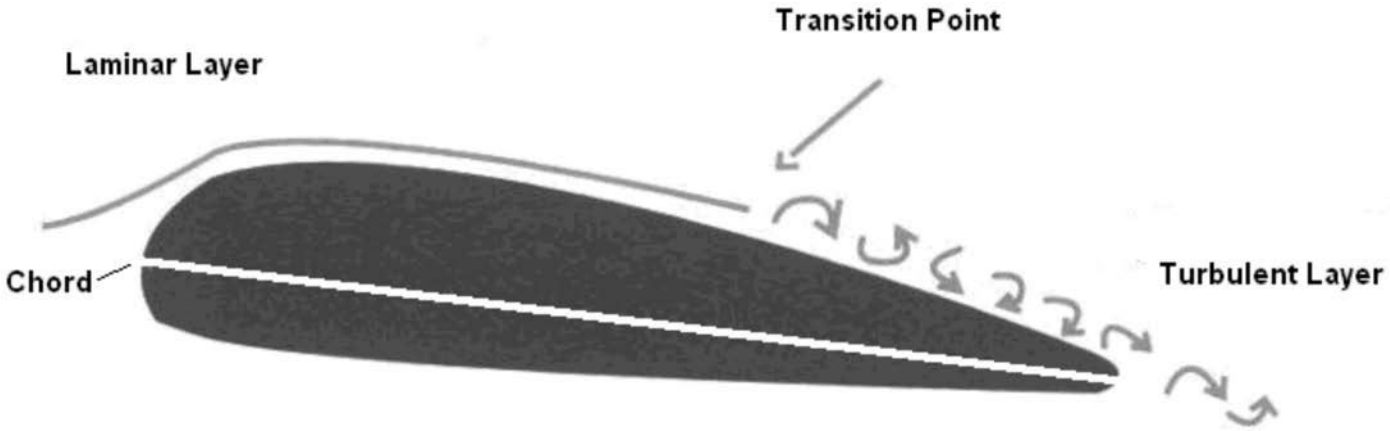

Figure A-1 Laminar and Turbulent Layers

Note. From *From the Ground Up: Millennium Edition* (p. 25), by A. F. MacDonald and I. L. Peppler, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

• Low camber • Low drag • High speed • Thin wing section	• Race planes • Fighters • Interceptors
• Deep camber • High lift • Low speed • Thick wing section	• Transports • Freighters • Bombers
• Deep camber • High lift • Low speed • Thin wing section	• Transports • Freighters • Bombers
• Low lift • High drag • Reflex trailing edge wing section	• Very little movement of centre of pressure • Good stability
• Symmetrical wing section (cambered top and bottom)	• Very little movement of centre of pressure • Good stability
• GA(W)-1 airfoil • Thicker for better structure and lower weight • Good stall characteristics	• Camber is maintained farther rearward which increases lifting capability over more of the airfoil and decreases drag

Figure A-2 Airfoil Sections

Note. From *From the Ground Up: Millennium Edition* (p. 26), by A. F. MacDonald and I. L. Peppler, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

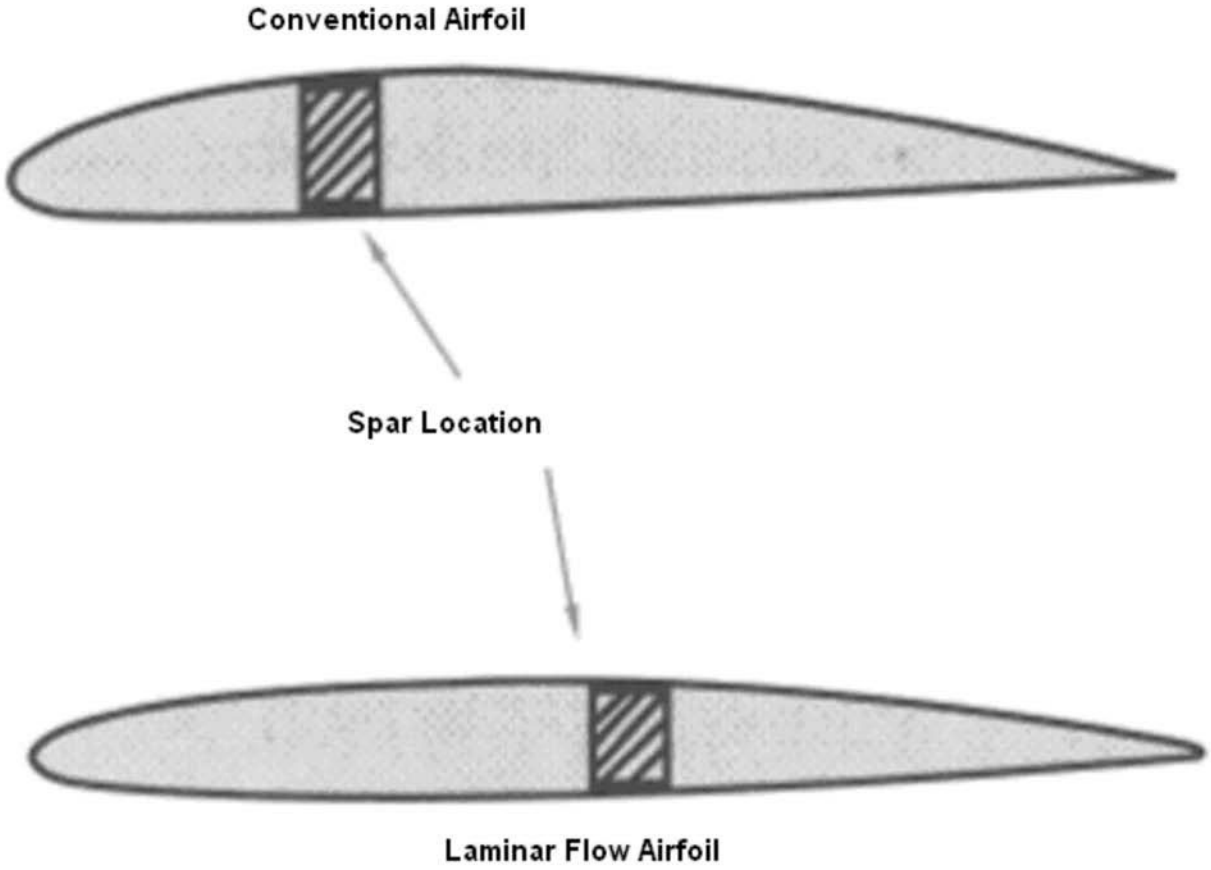

Figure A-3 Conventional and Laminar Flow Airfoils

Note. From *From the Ground Up: Millennium Edition* (p. 27), by A. F. MacDonald and I. L. Peppler, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

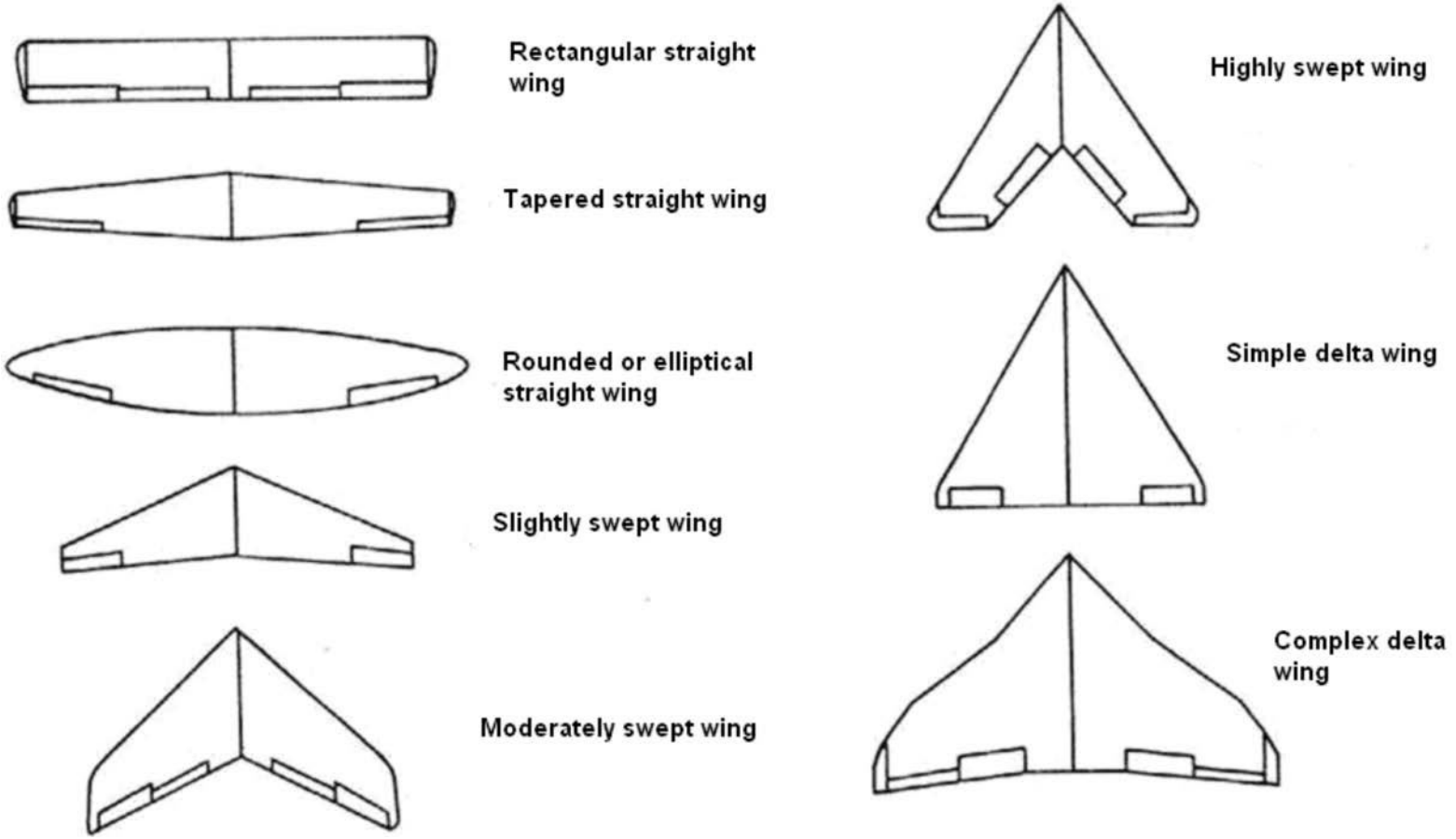

Figure A-4 Examples of Wing Planforms

Note. From "SP-367 Introduction to the Aerodynamics of Flight", *NASA*. Retrieved October 22, 2008, from http://history.nasa.gov/SP-367/f13b.htm

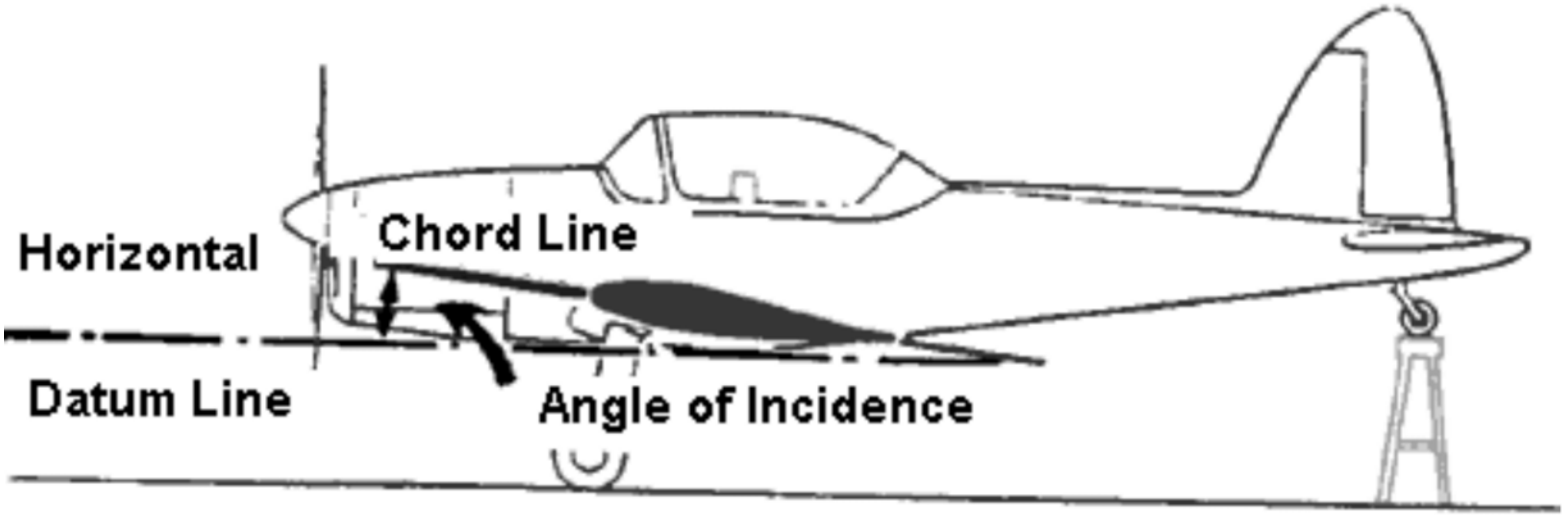

Figure A-5 Angle of Incidence

Note. From *From the Ground Up: Millennium Edition* (p. 27), by A. F. MacDonald and I. L. Peppler, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

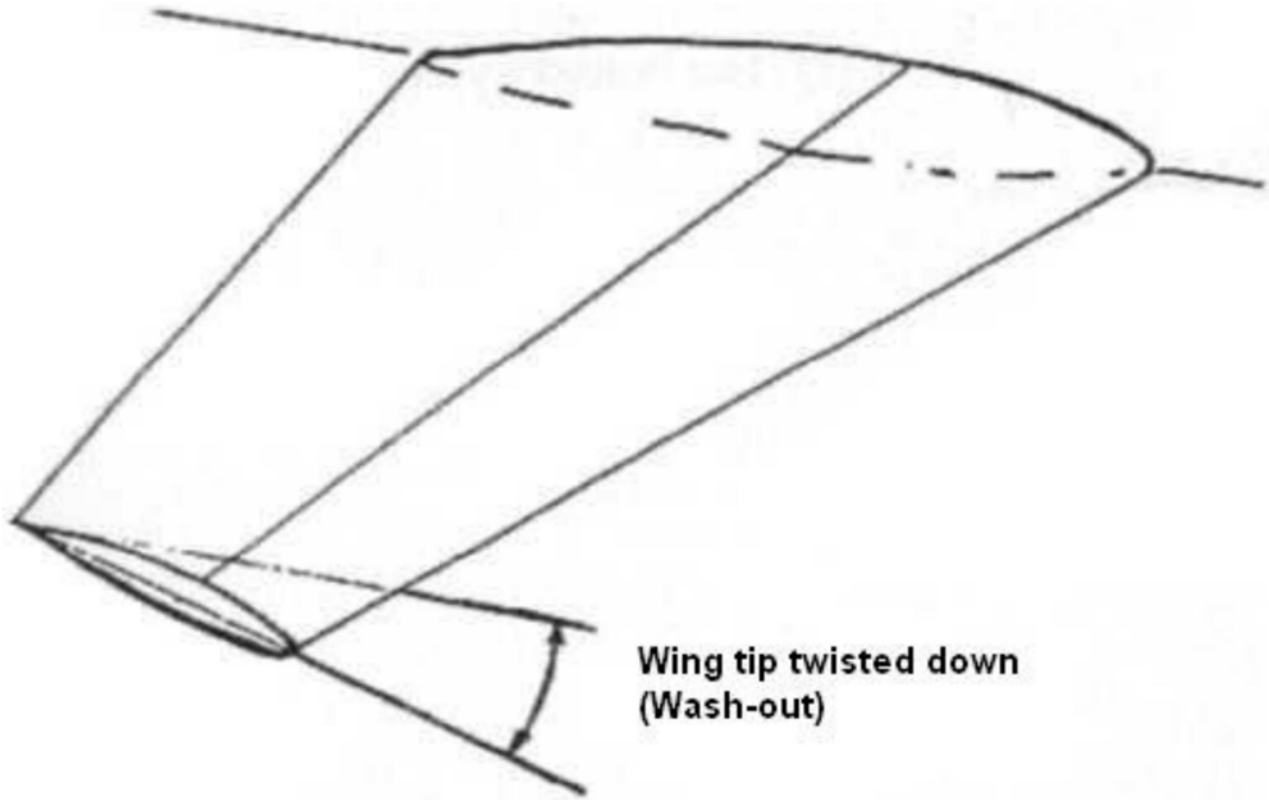

Figure A-6 Wash-Out

Note. From "Wing Twist and Dihedral", 2001, *Aerospaceweb.org*. Retrieved October 22, 2008, from http://www.aerospaceweb.org/question/dynamics/q0055.shtml

Figure A-7 Wing Tip Tanks and Winglets

Note. From "Canada's Air Force, Image Gallery, Details", 2006, *Department of National Defence*, Copyright 2006 by Department of National Defence. Retrieved October 22, 2008, from http://www.airforceimagery.forces.gc.ca/netpub/server.np?find&catalog=casimages&template=detail2_e.np&field=itemid&op=matches&value=4461&site=casimages

Figure A-8 Drooping the Wing Tips

Note. From "Cessna 170", 2008, *Barnstormers.com*. Retrieved October 22, 2008, from http://www.barnstormers.com/listing_images.php?id=266438&ZOOM=%2Fclassified_files%2F266438-DSC04234.jpg

Figure A-9 Wing Fences

Note. From "STOL Kit", *F. and H. (Aircraft)*. Retrieved October 22, 2008, from http://www.fandh-aircraft.co.uk/stol_kit.htm

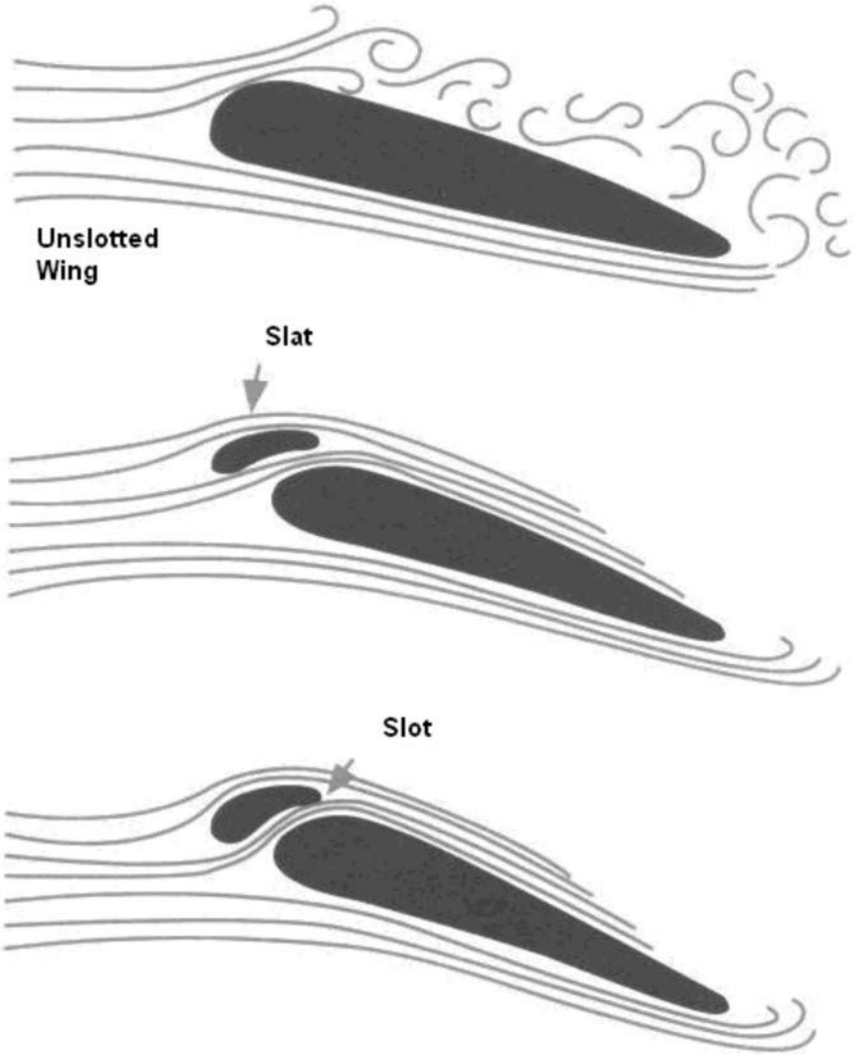

Figure A-10 Slotted Wings

Note. From *From the Ground Up: Millennium Edition* (p. 28), by A. F. MacDonald and I. L. Peppler, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

Figure A-11 Leading Edge Slot

Note. From "Stinson 108", 2005, *Wikipedia*. Retrieved October 22, 2008, from http://en.wikipedia.org/wiki/Image:Stinson108-3photo03.jpg

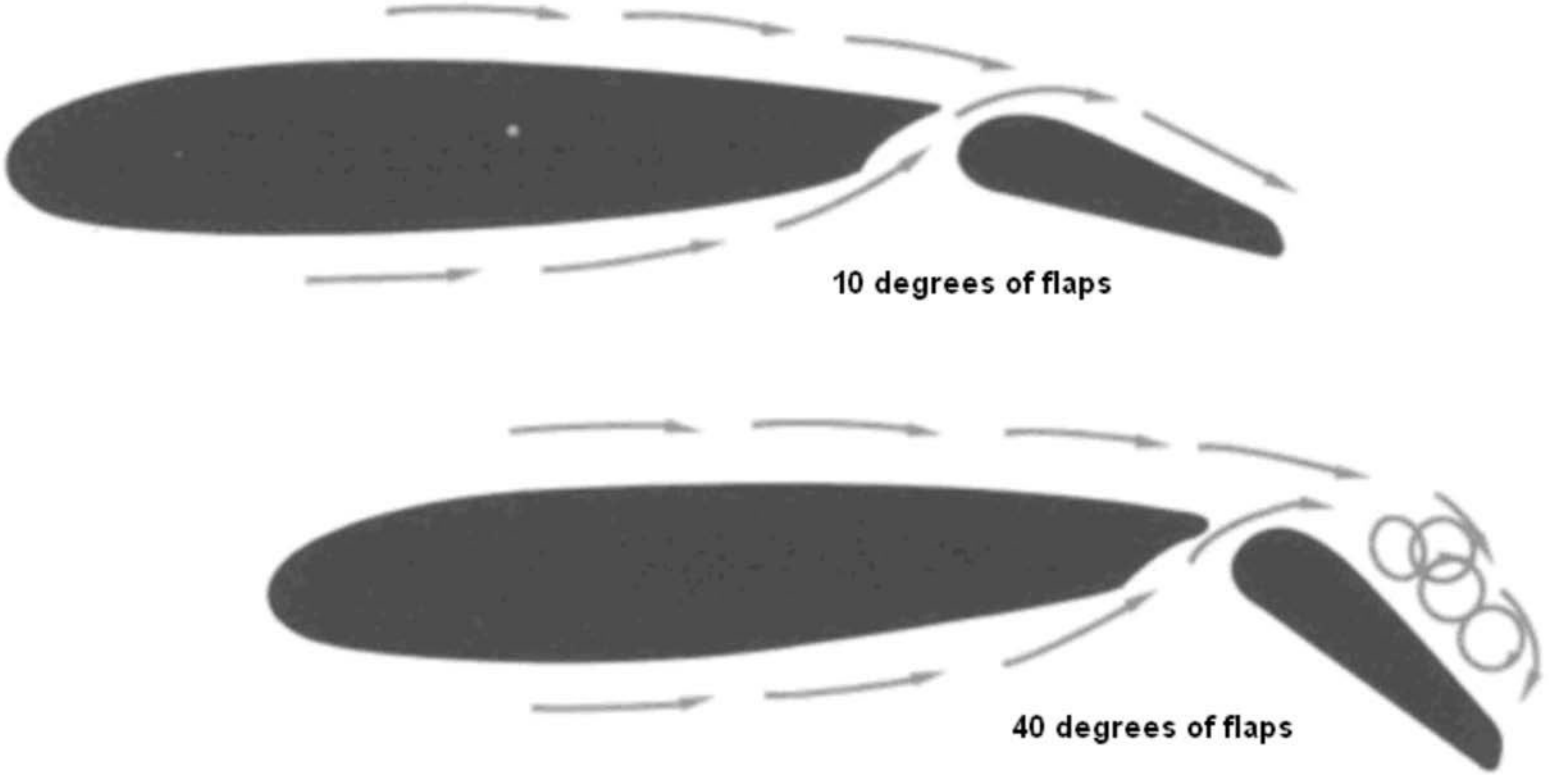

Figure A-12 Flap Settings

Note. From *From the Ground Up: Millennium Edition* (p. 29), by A. F. MacDonald and I. L. Peppler, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

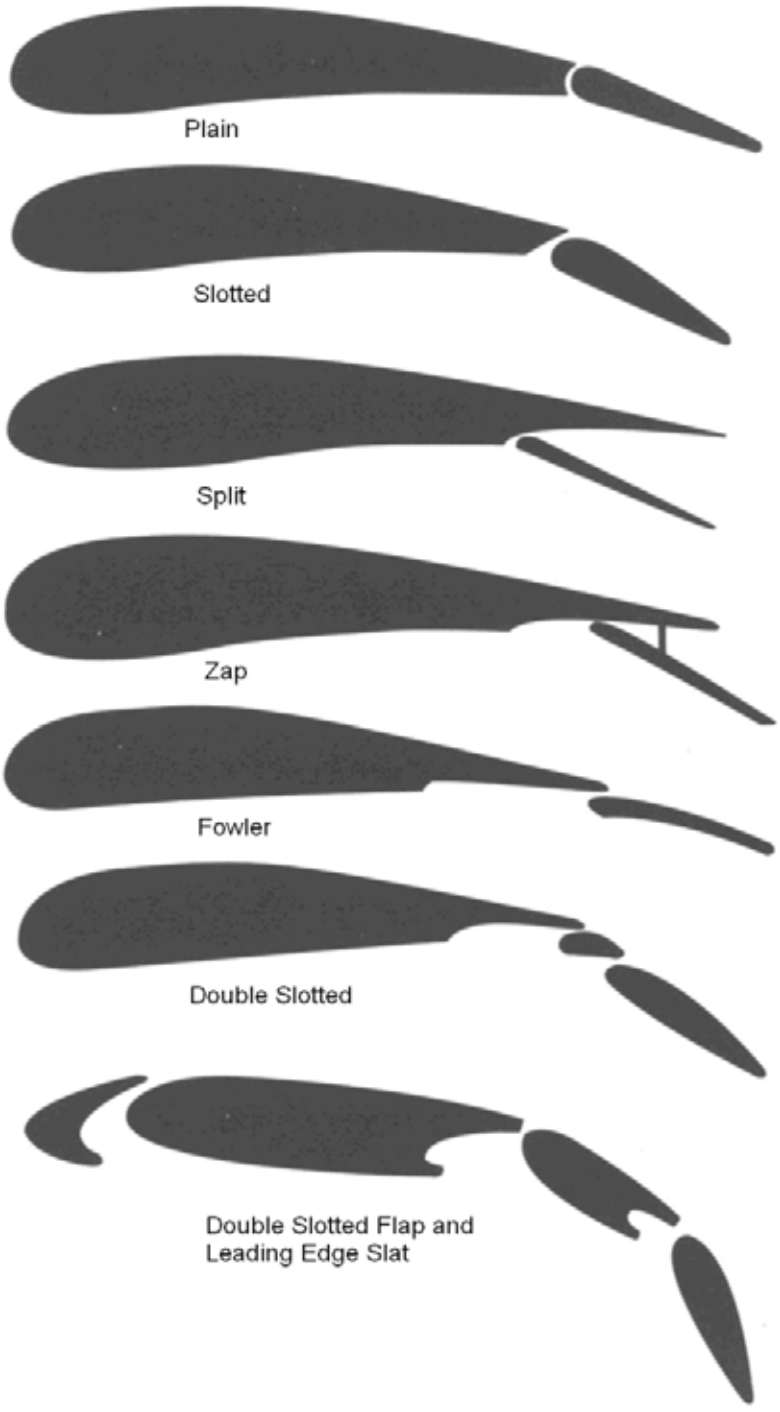

Figure A-13 Flaps

Note. From *From the Ground Up: Millennium Edition* (p. 29), by A. F. MacDonald and I. L. Peppler, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

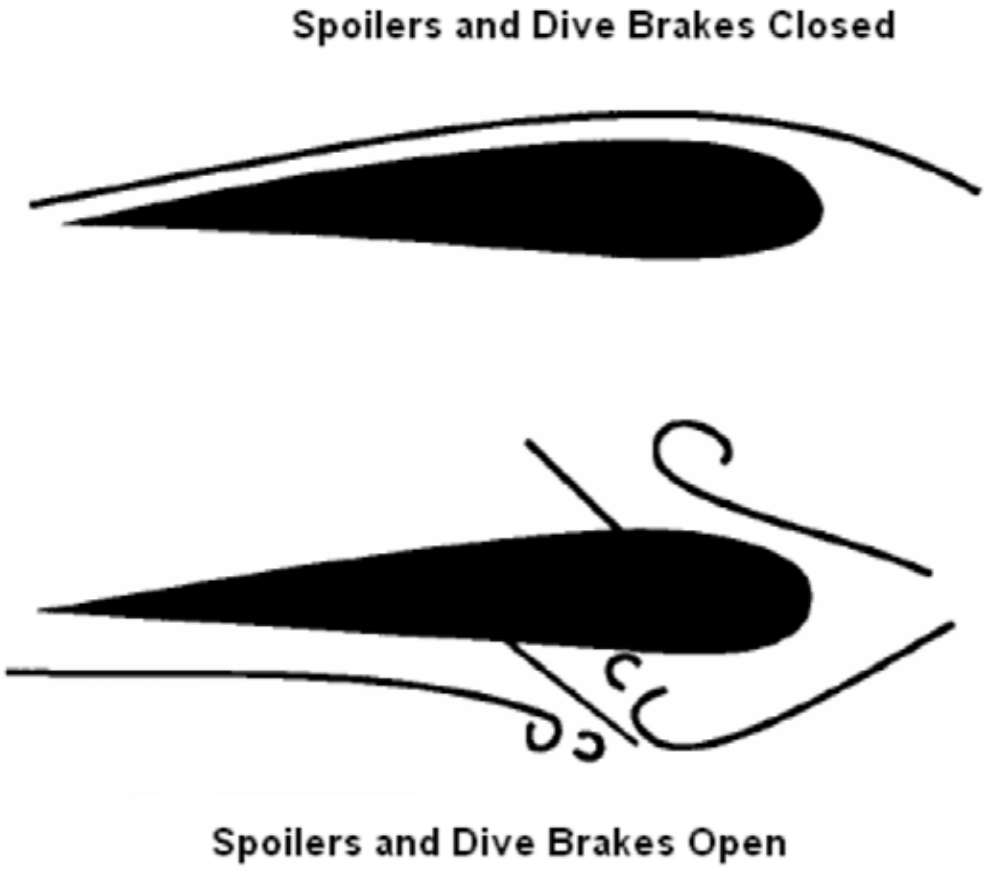

Figure A-14 Spoilers and Dive Brakes

Note. From *Air Cadet Gliding Program Manual* (p. 6-3-2), 2008, Ottawa, ON: Department of National Defence.

ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 2

EO M431.02 – DESCRIBE FLIGHT INSTRUMENTS

Total Time: 60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy Attachment A for each cadet.

Prepare slides of the figures located at Attachment A.

Obtain a gyroscope for use in TP2.

Construct a working model of each of the pitot static instruments IAW Attachment C.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to clarify, emphasize and summarize flight instruments.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to describe flight instruments.

IMPORTANCE

It is important for cadets to be able to describe flight instruments as they are the basic instruments used during flight. Being able to describe flight instruments provides knowledge for potential instructional duties and is part of the fundamentals that cadets pursuing future aviation training will require.

Teaching Point 1 **Review the pitot static system and pitot static instruments.**

Time: 25 min Method: Interactive Lecture

PITOT STATIC SYSTEM

Instruments connected to the pitot static system work on air pressure. There are two types of air pressure in the pitot static system:

- pitot pressure, and
- static pressure.

Pitot pressure. The increase in air pressure caused by the forward motion of the aircraft through the air.

Static pressure. The atmospheric pressure outside the aircraft, not affected by turbulence or motion.

Show the slide of Figure A-1 to the cadets.

The airspeed indicator (ASI) is connected to both the pitot pressure source (usually a tube attached to the nose or wing) and the static pressure port(s) (usually a small vent on the side of the aircraft). The altimeter and the vertical speed indicator (VSI) are connected only to the static pressure port.

Both the pitot tube and static pressure ports should be carefully checked during the walk-around inspection prior to flight to ensure they are not blocked. A blockage will cause an instrument to provide an incorrect reading. During flight, it is possible for the pitot tube to become blocked by ice. Aircraft that are designed to be flown under instrument flight rules (IFR) will have a pitot heater to prevent ice buildup in the pitot tube.

AIRSPEED INDICATOR (ASI)

The ASI is connected to both the pitot pressure source and static pressure port(s) and displays the difference between the two pressures as the speed of the aircraft moving through the air (not over the ground).

ASI Markings

The ASI has colour-coded markings to indicate operating ranges and speeds.

Show the slide of Figure A-2 to the cadets.

Red. A red line indicates the never exceed speed (V_{NE}).

Yellow. A yellow arc starts at the maximum structural cruise (V_{NO}) and extends to the V_{NE}. This area is typically known as the caution range.

Green. The normal operating range. It starts at the power-off stalling speed (V_{SL}) and extends to the V_{NO}.

White. The range in which fully extended flaps may be used. It starts at the power-off stalling speed with flaps and gear extended (V_{SO}) and extends to the maximum flaps extended speed (V_{FE}).

ASI Errors

Density error. The ASI is calibrated for normal sea level pressure of 29.92 inches of mercury (Hg) at a temperature of 15 degrees Celsius. Temperature and pressure normally decrease with an increase in altitude, decreasing the density of the air and causing the ASI to read less than the true airspeed.

Position error. Results from the position of the pitot pressure source. Eddies formed by air moving over the aircraft and the angle of the pitot source to the airflow cause position error.

Lag error. A mechanical error that is the result of friction between the working parts of the instrument. This error is responsible for a slight delay between a change in airspeed occurring and the change being shown on the instrument.

Icing error. The error caused by a complete or partial blockage of the pitot pressure by ice. This error can be prevented or corrected by turning on the pitot heat (if equipped) or descending to a lower altitude where the outside air temperature (OAT) is higher.

Water error. Water in the system can cause higher or lower than normal readings and may block the system completely. Water can be kept out of the system by covering the pitot source when the aircraft is parked. This will also keep dirt and insects from entering the system.

Airspeed Definitions

Indicated airspeed (IAS). The uncorrected airspeed read from the instrument dial.

Calibrated airspeed (CAS). The IAS corrected for instrument (lag) error and installation (position) error.

Equivalent airspeed (EAS). The CAS corrected for the compressibility factor. This is very significant to aircraft operating above 10 000 feet and 250 knots (kt).

True airspeed (TAS). The CAS (or EAS) corrected for density (pressure and temperature).

ALTIMETER

The altimeter is connected only to the static pressure port(s) and measures the pressure of the outside air. A sealed aneroid capsule inside the instrument case expands or contracts due to changes in the static pressure. The expansion or contraction is mechanically linked to the indicator's needles and causes them to rotate around the dial to show the altitude.

Show the slide of Figure A-3 to the cadets.

Altimeter Errors

Pressure error. Barometric pressure varies from place to place and this error is corrected by using an altimeter setting obtained from the nearest aviation facility (flight service station, control tower, etc). All aircraft flying in the same area should be using the same altimeter setting.

"From high to low—look out below".

When an aircraft flies into an area with a relatively lower pressure, if the altimeter setting is not corrected, the altimeter will read higher than the actual altitude. For example, the altimeter may be indicating 4 000 feet, while the actual altitude may be

3 000 feet. This could cause a conflict with other aircraft, or even worse, cause the aircraft to come into contact with the ground.

Abnormally high pressure. Cold, dry air masses are capable of producing barometric pressures in excess of 31.00 inches of Hg (the limit of the altimeter setting scale in most altimeters). In this case, the actual altitude will be higher than the altitude indicated on the altimeter.

Abnormally cold temperature. Altimeters are calibrated for the standard atmosphere (15 degrees Celsius at sea level) and any deviation from that will cause an error. Extremely low temperatures may cause as much as 20 percent error in the altimeter, causing the altimeter to read higher than the actual altitude.

Mountain effect error. Increased wind speed through mountain passes or in mountain waves may cause a localized area of low pressure. Temperatures may also be affected, compounding the altimeter error.

Altitude Definitions

Indicated altitude. The altitude displayed on the altimeter when it is set to the current barometric pressure.

Pressure altitude. The altitude displayed on the altimeter when it is set to the standard barometric pressure (29.92 inches of Hg).

Density altitude. The pressure altitude corrected for temperature.

Absolute altitude. The actual height above the Earth's surface (the altimeter set to field level pressure).

VERTICAL SPEED INDICATOR (VSI)

The VSI is connected only to the static pressure port(s). The rate of change of the static pressure is transmitted to the needle to indicate if the altitude is increasing or decreasing.

Show the slide of Figure A-4 to the cadets.

Even though the VSI will quickly indicate a climb or descent, it may take several seconds before the correct rate of descent is displayed. This delay is known as lag. An instantaneous VSI has a complicated system of pistons and cylinders instead of the simpler aneroid capsule found in most VSIs and does not experience lag.

ACTIVITY

Time: 10 min

OBJECTIVE

The objective of this activity is to have the cadets practice reading pitot static instruments.

RESOURCES

- One working model of each of the pitot static instruments, including:
  - ASI,
  - altimeter, and
  - VSI; and
- Questions located at Attachment B.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into two groups.
2. Set one model at a time (in no particular order) and allow each group five seconds to read the instrument.
3. Have one group read the instrument to the class. The group gets one point for a correct answer.
4. If a group cannot correctly read the instrument then the other group can steal the point.
5. Repeat Steps 2–4 for the remaining time.
6. Declare the group with the most points the winner.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the activity will serve as the confirmation of this TP.

Teaching Point 2 **Describe the gyroscope and gyroscopic instruments.**

Time: 15 min Method: Interactive Lecture

THE GYROSCOPE

The gyroscope is a spinning wheel (rotor) in a universal mounting (gimbal) that allows its axle to be pointed in any direction.

Show the slide of Figure A-5 to the cadets.

Gyroscopic Inertia

Also known as rigidity in space, gyroscopic inertia is the tendency of a rotating object to remain in its plane of rotation. This allows the spinning rotor to remain in place regardless of how the gimbal is moved around it.

Precession

Precession is the tendency of a rotating body, when a force is applied perpendicular to its plane of rotation, to turn in the direction of its rotation 90 degrees to its axis and take up a new plane of rotation parallel to the force applied.

Demonstrate gyroscopic inertia and precession to the cadets using a gyroscope.

Power Sources

To work properly the rotor must be kept spinning at a constant speed. The gyroscopic instruments may be powered by one or more power source.

Engine driven vacuum system. A vacuum pump powered by the engine. It does not work if the engine is not running (eg, prior to startup, following an engine failure). A variation of this system is an engine driven air pump that uses positive air pressure to spin the rotor.

Venturi driven vacuum system. A venturi tube on the outside of the aircraft creates a vacuum to spin the rotor. Simple to install, it has no moving parts that could fail, but depends on the airspeed of the aircraft and the tube causes additional drag.

Electrically driven gyroscopes. The rotor is spun by an electric motor allowing the gyroscope to work at high altitudes where vacuum systems are ineffective.

Care of Gyroscopic Instruments

Gyroscopic instruments are precision instruments and need to be cared for properly to prevent premature failure and damage. The air used to spin the rotor (vacuum or positive pressure) must be filtered to prevent dust and dirt from contaminating the system. The instruments need to be handled gently during installation and removal. Some gyroscopes must also be locked (caged) prior to aerobatics. Venturi driven systems are also susceptible to ice blockages.

HEADING INDICATOR (HI)

Show the slide of Figure A-6 to the cadets.

The HI (directional gyro [DG]) is steady and accurate as it is not afflicted with any of the errors that apply to magnetic compasses (eg, northerly turning error, acceleration and deceleration errors). It remains constant without swinging or oscillating and provides accurate readings even in rough air.

The cadets will learn about the magnetic compass in more detail in EO M437.02 (Describe the Magnetic Compass).

Vacuum driven HIs may take up to five minutes for the rotor to reach operating speed and should not be used during this period. Venturi driven HIs can not be used while taxiing or during takeoff. Once the rotor is spinning at the correct speed, the HI needs to be set to the current heading (by referencing the magnetic compass or runway heading).

Friction in the gyroscope causes a small amount of precession and will cause the reading to drift approximately three degrees over a period of 15 minutes. It is also subject to apparent precession. The rotation of the Earth gives the gyroscope an apparent motion relative to the Earth. This error varies with latitude. Apparent precession is zero at the equator and 15 degrees per hour at the poles.

Precession errors are easily corrected by resetting the HI to the current heading (by referencing the magnetic compass during straight and level flight) every 15 minutes.

ATTITUDE INDICATOR (AI)

Show the slide of Figure A-7 to the cadets.

The AI (artificial horizon or gyro horizon) is designed to provide an artificial horizon for the pilot during periods of poor visibility (eg, fog, clouds, rain, snow). The artificial horizon provides attitude information to the pilot (pitch and bank).

During acceleration or deceleration, precession will cause a slight indication of a climb or descent, respectively.

TURN AND SLIP INDICATOR

Show the slide of Figure A-8 to the cadets.

The turn and slip indicator (turn and bank) is a combination of two instruments and is also known as the needle and ball. The direction and rate of turn is indicated by the needle. The needle is controlled by a gyroscope. The ball is controlled by gravity. During a properly executed turn, centripetal and centrifugal forces are balanced with gravity and the ball stays in the centre. During a slipping turn there is not enough centrifugal force and the gravity will pull the ball in the direction of the turn. During a skidding turn there is not enough centripetal force and the ball is pulled in the opposite direction of the turn.

The turn and slip indicator does not indicate the amount of bank of the aircraft. It indicates the rate of turn and if the aircraft is skidding or slipping in the turn.

During a standard rate (rate one) turn, the aircraft turns at a rate of three degrees per second (360 degrees in two minutes).

The turn and slip indicator will also indicate if a wing is low during straight flight. If the needle is centred but the ball is not, then the wing on the side that the ball has moved to is low.

TURN CO-ORDINATOR

Show the slide of Figure A-9 to the cadets.

The turn co-ordinator is an updated version of the turn and slip indicator and is able to display the rate of roll as well as the rate of turn.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What is gyroscopic inertia?

Q2. What errors affect the HI?

Q3. Which gyroscopic instrument can display the rate of roll as well as the rate of turn?

ANTICIPATED ANSWERS:

A1. Gyroscopic inertia is the tendency of a rotating object to remain in its plane of rotation.

A2. Precession and apparent precession.

A3. The turn co-ordinator.

Teaching Point 3 **Describe the angle of attack (AOA) indicator.**

Time: 5 min Method: Interactive Lecture

ANGLE OF ATTACK (AOA) INDICATOR

Show the slide of Figure A-10 to the cadets.

An aircraft will stall at different airspeeds depending on factors such as weight, load factor, and configuration. A stall will occur if the critical angle of attack is exceeded. The AOA indicator displays the relationship between the chord line of the wing and the relative airflow. Many indicators also have colour-coded ranges to alert the pilot that the critical AOA is being approached.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. What does the AOA indicator display?

ANTICIPATED ANSWERS:

A1. The AOA indicator displays the relationship between the chord line of the wing and the relative airflow.

Teaching Point 4 **Describe the Mach indicator.**

Time: 5 min Method: Interactive Lecture

MACH INDICATOR

Show the slide of Figure A-11 to the cadets.

The Mach indicator displays the ratio of its airspeed to the local speed of sound. The Mach number is calculated by dividing the airspeed by the speed of sound. A Mach number of one means that the aircraft is travelling at the speed of sound. The Mach indicator measures and correlates static and dynamic pressures.

Distribute the handouts of flight instruments located at Attachment A to each cadet.

CONFIRMATION OF TEACHING POINT 4

QUESTIONS:

Q1. How is the Mach number calculated?

ANTICIPATED ANSWERS:

A1. The Mach number is calculated by dividing the airspeed by the speed of sound.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. What is density altitude?

Q2. How long does it take to complete a standard rate 360-degree turn?

Q3. How does the Mach indicator work?

ANTICIPATED ANSWERS:

A1. The pressure altitude corrected for temperature.

A2. Two minutes.

A3. The Mach indicator works by measuring and correlating static and dynamic pressures.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO will be assessed IAW A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, Aviation Subjects–Combined Assessment PC.

CLOSING STATEMENT

Future aviation training and instructional duties require knowledge of pitot static instruments, gyroscopes and gyroscopic instruments.

INSTRUCTOR NOTES / REMARKS

Cadets who are qualified Advanced Aviation may assist with this instruction.

REFERENCES

C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Peppler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.

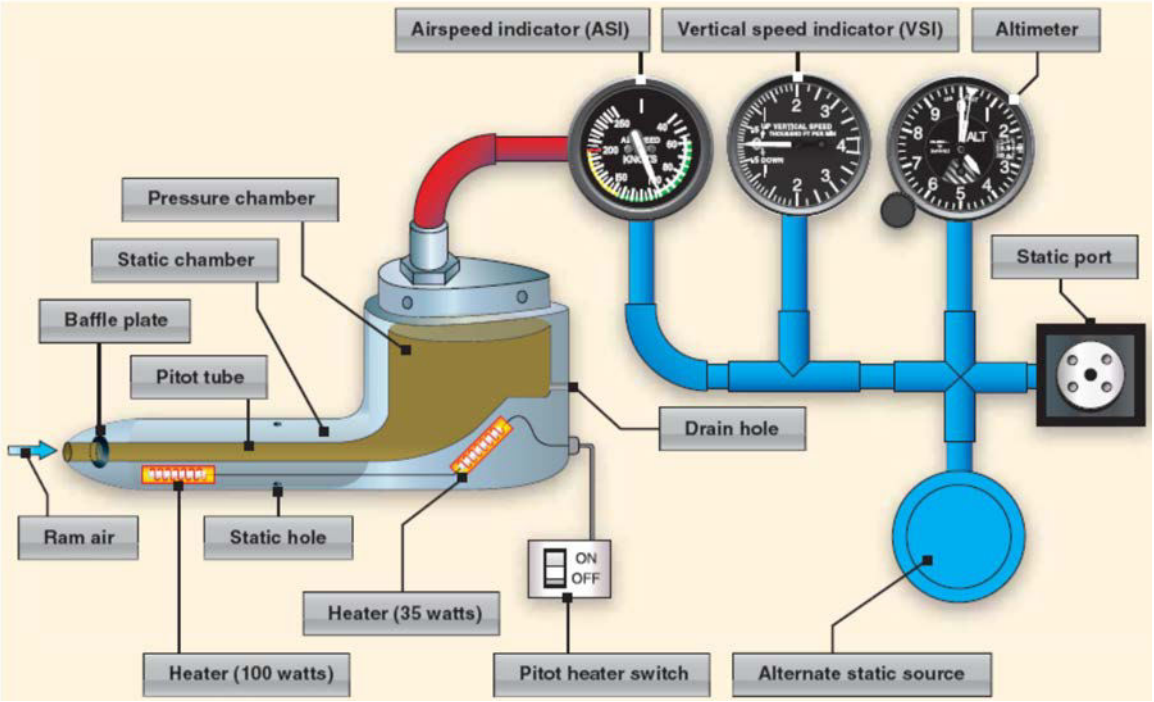

Figure A-1 Pitot Static System

Note. From "Pilot's Handbook of Aeronautical Knowledge", *Federal Aviation Administration*. Retrieved November 19, 2008, from http://www.faa.gov/library/manuals/aviation/media/FAA-H-8083-25A.pdf

Figure A-2 Airspeed Indicator

Note. From "Flight Instruments", *North American Powered Parachute Federation*. Retrieved October 30, 2007, from http://www.nappf.com/nappf_flight_instruments.htm

Figure A-3 Altimeter

Note. From "Flight Instruments", *North American Powered Parachute Federation*. Retrieved October 30, 2007, from http://www.nappf.com/nappf_flight_instruments.htm

Figure A-4 Vertical Speed Indicator

Note. From "Flight Instruments", *North American Powered Parachute Federation*. Retrieved October 30, 2007, from http://www.nappf.com/nappf_flight_instruments.htm

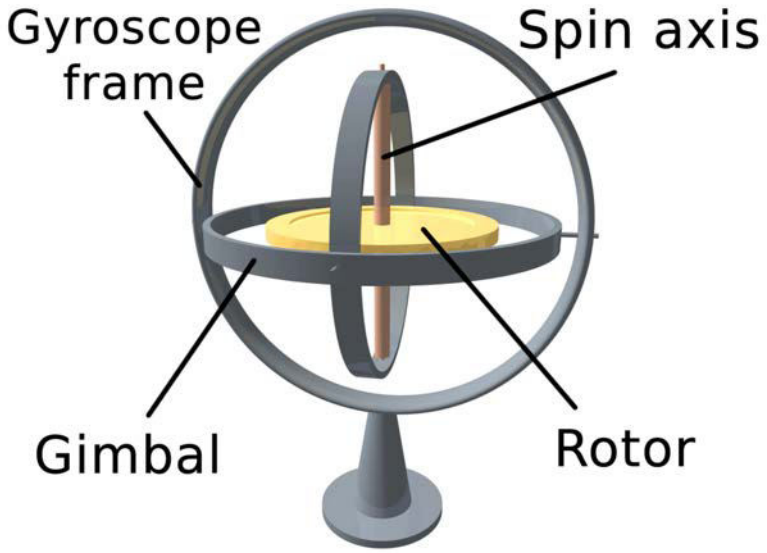

Figure A-5 Gyroscope

Note. From "3D Gyroscope", *Wikimedia*. Retrieved November 18, 2008, from http://upload.wikimedia.org/wikipedia/commons/e/e2/3D_Gyroscope.png

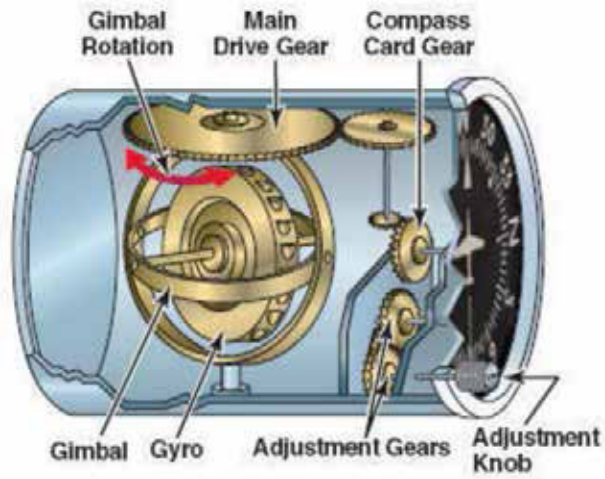

Figure A-6 Heading Indicator

Note. From "The Journal for the Proficient Pilot", *Over the Airwaves*. Retrieved November 18, 2008, from http://overtheairwaves.com/vol3-46.jpg

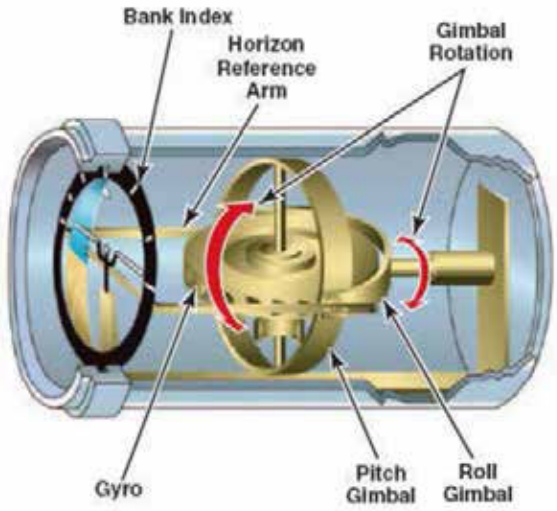

Figure A-7 Attitude Indicator

Note. From "The Journal for the Proficient Pilot", *Over the Airwaves*. Retrieved November 18, 2008, from http://overtheairwaves.com/vol3-45.jpg

Figure A-8 Turn and Bank Indicator

Note. From "Turn and Bank Indicator", *Integrated Publishing*. Retrieved November 18, 2008, from http://www.tpub.com/content/aviation/14014/img/14014_164_2.jpg

Figure A-9 Turn Co-ordinator

Note. From "More Instruments", *Wings and Wheels*. Retrieved November 18, 2008, from http://www.wingsandwheels.com/images/turn%20coordinator.gif

Figure A-10 AOA Indicator

Note. From "Stall/Spin", *AOPA Online*. Retrieved November 18, 2008, from http://www.aopa.org/images/asf/tn_spin_9.jpg

Figure A-11 Mach Indicator

Note. From "Mach Airspeed Indicator (MASI)", *Innovative Solutions and Support*. Retrieved November 18, 2008, http://www.innovative-ss.com/media/images/masi2.gif

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SAMPLE QUESTIONS

Set the specific training aid to the desired reading. Allow a team to provide an answer. Use a different instrument for each question.

ASI Questions

For each question, set the ASI training aid to the desired value. These can be asked in any order.

125 kt
65 kt
40 kt
75 kt
180 kt
210 kt
98 kt
110 kt
55 kt

VSI Questions

For each question, set the VSI training aid to the desired value. These can be asked in any order.

+200 feet per minute
+300 feet per minute
+150 feet per minute
+500 feet per minute
+800 feet per minute
-1000 feet per minute
-250 feet per minute
-900 feet per minute
-1200 feet per minute

Altimeter Questions

For each question, set the altimeter training aid to the desired value. These can be asked in any order.

8 900 feet
1 300 feet
2 600 feet
11 000 feet
1 250 feet
600 feet
400 feet
300 feet
1 000 feet

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INSTRUCTIONS FOR CREATION OF PITOT STATIC INSTRUCTIONAL AIDS

Resources

- One sheet of bristol board per training aid,
- One brass Acco fastener per training aid,
- Pencil,
- Compass from a geometry set,
- Ruler or straight edge,
- Coloured markers, and
- White bristol board.

Instructions – ASI

1. Draw a representation of an ASI in the centre of the bristol board. Include all of the numbers and coloured arcs / lines. Use Figure A-2 as a guide.
2. Colour the arcs and lines with the appropriate colours (white arc, green arc, yellow arc and red line).
3. Cut out a dial hand from the white bristol board.
4. Attach the dial hand to the centre of the ASI using the brass Acco fastener.
5. Ensure that the hand can move when needed, but that there is enough friction to keep it from moving on its own.

Instructions – Altimeter

1. Draw a representation of an altimeter's face in the centre of the bristol board. Include all of the numbers and graduated lines between the numbers. Use Figure A-3 as a guide.
2. Colour the altimeter. To add variety of colour, use yellow and black for the polygon shape under the hands' pivot point.
3. Cut dial hands from the white bristol board to represent the hands of an altimeter.
4. Attach the hands to the centre of the altimeter using the brass Acco fastener.
5. Ensure that the hands can move when needed, but that there is enough friction to keep them from moving on their own.

Instructions – VSI

1. Draw a representation of a VSI in the centre of the bristol board. Include all of the numbers on the positive and negative scales. Ensure that zero is located on the left side. Use Figure A-4 as a guide.
2. Colour the VSI.
3. Cut out a dial hand from the white bristol board.
4. Attach the hand to the centre of the VSI using the brass Acco fastener.
5. Ensure that the hand can move when needed, but that there is enough friction to keep it from moving on its own.

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ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 3

EO C431.01 – EXPLAIN FLIGHT PERFORMANCE FACTORS

Total Time: 60 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Prepare handouts for each cadet and slides of the figures located at Attachment A.

Obtain a model aircraft with articulated control surfaces and flaps for use in TPs 1–5.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to clarify, emphasize and summarize flight performance factors.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to explain flight performance factors.

IMPORTANCE

It is important for cadets to be able to explain flight performance factors as they apply to all stages of flight. Being able to explain flight performance factors provides knowledge for potential instructional duties and is part of the fundamentals that cadets pursuing future aviation training will require.

Use the model aircraft with articulated control surfaces and flaps throughout this lesson to illustrate flight performance factors as they are discussed.

Provide a handout of the figures to each cadet located at Attachment A.

Teaching Point 1 **Explain left turning tendencies.**

Time: 15 min Method: Interactive Lecture

LEFT TURNING TENDENCIES

Most airplane engines turn the propeller in a clockwise direction (as seen from the pilot's seat). As a result of four different factors, this produces a tendency for the airplane to turn left. These tendencies must be factored into the design of the airplane or corrected by the pilot.

Torque

Show the slide of Figure A-1 to the cadets.

Newton's Third Law of Motion states that every action has an equal and opposite reaction. This means that the clockwise rotation of the propeller is counteracted by a counter-clockwise rotation of the airplane. This reaction tends to force the left wing downwards, producing a tendency to turn left.

To correct this, airplanes can be designed with a right turning tendency, typically by having a slightly greater angle of incidence on the left wing. During takeoff (when the engine is usually running at full power) additional corrections must be applied by the pilot (rudder and / or ailerons) because of the increased amount of torque.

Asymmetric Thrust

Show the slide of Figure A-2 to the cadets.

At high angles of attack and high power settings (eg, takeoff) the blade of the propeller that is travelling down (the blade on the right) has a greater angle of attack than the blade that is travelling up. This creates more thrust from the right side of the propeller and creates a tendency for the aircraft to yaw or turn left.

To correct for asymmetric thrust (also known as P Factor), the pilot uses right rudder.

Precession

Show the slide of Figure A-3 to the cadets.

The spinning propeller acts like a gyroscope and tends to stay in the same plane of rotation, and resists any change to the plane. When a perpendicular force is applied to change the plane, a resultant force called precession is the result.

The force of precession is ahead of the plane of rotation and 90 degrees to the original applied force. Precession occurs in airplanes when the tail is lifted or lowered (eg, takeoff in a tailwheel aircraft).

To correct for precession, the pilot uses right rudder.

Slipstream

Show the slide of Figure A-4 to the cadets.

The air being pushed backwards by the propeller has a corkscrew motion and is called the slipstream. This causes more pressure on the left side of the fuselage and tail, and results in a tendency for the airplane to turn left.

The effects of the slipstream can be corrected by having the engine thrust line offset to the right, and / or by offsetting the vertical fin. When the airspeed of the airplane is low (eg, takeoff) the pilot may have to apply right rudder.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What four factors contribute to an airplane's left turning tendency?

Q2. Which propeller blade has a greater angle of attack at high angles of attack?

Q3. Which factor produces more pressure on the left side of the fuselage and tail?

ANTICIPATED ANSWERS:

A1. Torque, asymmetric thrust, precession, and slipstream.

A2. The blade moving downwards.

A3. Slipstream.

Teaching Point 2 **Explain climbs and glides.**

Time: 10 min Method: Interactive Lecture

CLIMBS

During level flight at a constant airspeed, the engine produces thrust equal to drag, and the wings produce lift equal to weight. A pilot can initiate a climb by increasing the angle of attack (eg, pulling back on the stick) to produce more lift. The aircraft will climb but the airspeed will decrease.

Show the slide of Figure A-5 to the cadets.

The pilot could also initiate a climb by increasing the power setting of the engine (which would cause an increase in airspeed). If the angle of attack is not changed, the increased airspeed will create additional lift and the airplane will climb.

Once the climb is established, the aircraft is again in equilibrium. The attitude of the aircraft creates a rearward component of weight. In this state, thrust must equal drag plus the rearward component of weight and lift must equal weight, less its rearward component.

The extra power available from the engine to overcome the rearward component of weight determines the aircraft's ability to climb. As the altitude of the airplane increases, the air becomes less dense, and the available power of the engine decreases. The climb angle is reduced and further climbing eventually becomes impossible. The altitude at which this occurs is the absolute ceiling of the airplane.

Best rate of climb (V_Y). The rate of climb that gains the most altitude in the least amount of time. It is normally used during takeoff after all obstacles have been cleared.

Best angle of climb (V_X). The angle of climb that gains the most altitude in a given distance. It is used during takeoff to clear obstacles at the departure end of the runway.

Normal climb (cruise climb). The rate of climb recommended for prolonged climbs. It provides better cooling, visibility, and control compared to V_Y.

GLIDES

Show the slide of Figure A-6 to the cadets.

During a glide, the engine is producing minimal power and the airplane is influenced by gravity. In this state, equilibrium is achieved by balancing lift, weight, and drag.

To increase airspeed, the angle of the glide must be increased. Reducing airspeed creates a shallower glide, until the point of a stall.

A windmilling propeller (the propeller is being spun by the relative wind, not the power of the engine) can reduce the gliding distance by approximately 20 percent. Although getting the propeller to stop can increase the gliding

range, it is difficult to perform. Additionally, the chances of restarting the engine are improved if the propeller is windmilling.

Best glide speed for range (maximum lift / drag). The airspeed which allows the aircraft to glide the farthest distance for altitude lost.

Best glide speed for endurance (minimum sink). The airspeed which allows the aircraft to remain in the air for the longest period of time.

Most airplane pilots are only concerned with the best glide speed for range airspeed as it is the airspeed usually used after an engine failure.

Sailplane (glider) pilots are concerned with both airspeeds. They use the minimum sink speed to remain in an area of rising air for as long as possible to extend the time of the flight.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What is V_Y?

Q2. What is V_X?

Q3. What three forces must be balanced during a glide to achieve equilibrium?

ANTICIPATED ANSWERS:

A1. Best rate of climb.

A2. Best angle of climb.

A3. Lift, weight, and drag.

Teaching Point 3 **Explain turns.**

Time: 5 min Method: Interactive Lecture

TURNS

Show the slide of Figure A-7 to the cadets.

In straight and level flight, the lift created by the wings is acting perpendicular to the wing span (vertically). To turn the aircraft, the pilot uses the ailerons to bank the aircraft in the direction of the desired turn. The lift is acting perpendicular to the wing span, but has both a horizontal and vertical component. It is the horizontal component of the lift (known as the centripetal force) that makes the aircraft turn. The opposing force (known as the centrifugal force) pulls the aircraft to the outside of the turn.

To maintain a constant altitude, the vertical component of lift must remain equal to the weight of the aircraft. This can be accomplished by increasing the angle of attack or the airspeed (by adding power). If the angle of

attack is increased, additional power must be added to maintain the desired airspeed. The steeper the angle of bank, the more the angle of attack and power must be increased to maintain altitude.

At any given airspeed, a steeper angle of bank produces:

- a higher rate of turn,
- a lower radius of turn,
- a higher stalling speed, and
- a higher load factor (G load).

At any given angle of bank, a higher airspeed produces:

- a lower rate of turn, and
- a larger radius of turn.

Load Factors in Turns

Show the slide of Figure A-8 to the cadets.

Turns increase the load factor. The steeper the angle of bank, the higher the load factor is. For example, a 60-degree bank produces a load factor of two. This means an aircraft that weighs 2 500 kg will have an equivalent weight of 5 000 kg. Very steep turns can produce very high load factors and may lead to structural failure.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. Which component of lift makes the aircraft turn when it is banked?

Q2. What is the name of the force that pulls the aircraft towards the outside of the turn?

Q3. At any given airspeed, what does a steeper angle of bank produce?

ANTICIPATED ANSWERS:

A1. The horizontal component (centripetal force).

A2. The centrifugal force.

A3. A steeper angle of bank produces:

- higher rate of turn,
- lower radius of turn,
- higher stalling speed, and
- higher load factor (G load).

Teaching Point 4 **Explain stalls, spins, and spirals.**

Time: 15 min Method: Interactive Lecture

STALLS

Show the slide of Figure A-9 to the cadets.

At low angles of attack, the air flows smoothly over the wing. As the angle of attack increases, the separation point between the laminar area and the turbulent area moves forward. At the critical angle of attack (determined by the design of the airfoil) the laminar flow separates from the wing and a large loss of lift (called a stall) occurs.

An airplane will stall:

- if the critical angle of attack is exceeded,
- at any airspeed if the critical angle of attack is exceeded, and
- at any attitude if the critical angle of attack is exceeded.

Symptoms of a Stall

As a stall is approached, there is usually a light buffeting of the airframe and controls. Lateral control of the aircraft is reduced as the ailerons lose their effectiveness in the separated airflow. When the stall is reached, lift is lost and the nose of the airplane drops.

A stall occurs gradually on most airplanes, giving the pilot time to recognize and react to the symptoms. If there is wash-out designed in the wing, the wing root will stall first and the ailerons will still be effective in the early stages of the stall.

Factors Affecting Stalls

Weight. Increasing the weight of an airplane increases the indicated airspeed at which it will stall.

Centre of gravity. Moving the centre of gravity forward increases the indicated airspeed at which the airplane will stall. Moving the centre of gravity rearward decreases the indicated airspeed at which it will stall. Moving the centre of gravity beyond the design limits will affect handling, stability, stall characteristics, and stall recovery.

Turbulence. An upward gust increases the angle of attack of the wing and could cause the airplane to exceed the critical angle at a lower airspeed than would be expected in calm air.

Show the slide of Figure A-10 to the cadets.

Turns. As the angle of bank in a turn is increased, the load factor and stalling speed increase. The stall speed in a turn can be calculated by multiplying the normal stall speed by the square root of the load factor.

Flaps. Increase the lift produced by the wing and lower the indicated airspeed at which the airplane will stall.

Snow, frost and ice. Accumulations on the wing (including dirt and bugs) disrupt the airflow and add additional weight (especially accumulations of ice) causing an increase in the airspeed at which the airplane will stall and a lower critical angle of attack.

Heavy rain. Increases the airspeed at which an airplane will stall as the water forms a film over the surface of the wing. Raindrops create craters and waves in the film, reducing lift and increasing drag, much like frost does.

Stall Recovery

To recover from the stall, the wing has to produce sufficient lift. In general, the stall recovery for most light aircraft involves reducing the angle of attack (below the critical angle of attack). Applying power to increase the airspeed may also be part of the recovery process.

The pilot operating handbook (POH) for most light aircraft lists the following steps to recover from a stall:

1. Reduce the angle of attack by moving the control column forward.
2. Apply power to increase the airspeed.
3. Return to level flight.

SPINS

Show the slide of Figure A-11 to the cadets.

A spin may develop after a stall if one wing becomes disturbed and produces a different amount of lift. This may happen as a result of using ailerons, applying rudder to produce yaw, entering a stall in a banked attitude, or movement of a wing by turbulent air.

When one wing drops, it has a larger angle of attack and produces less lift (as it has already stalled) compared to the wing that is moving up which has a smaller angle of attack. This difference accelerates the rolling motion and autorotation sets in.

Show the slide of Figure A-12 to the cadets.

Stages of a Spin

A spin has three stages:

1. incipient,
2. developed, and
3. recovery.

The incipient stage occurs from the time the airplane stalls and rotation starts until the spin axis becomes vertical or nearly vertical.

In the developed stage, the angles and motions of the airplane are stabilized and the flight path is nearly vertical. During this stage the airspeed has stabilized.

A spin is a stalled condition with a constant airspeed during the developed stage.

Spin characteristics are different for different aircraft so the technique for recovery from the specific POH must be followed. In the absence of recommendations from the manufacturer, most light airplanes can be brought out of a spin by following these steps:

1. Decrease power to idle and neutralize ailerons.
2. Apply full rudder in the opposite direction of the rotation.
3. Move the control column forward to reduce the angle of attack and unstall the wings.
4. When rotation stops, neutralize the rudder, level the wings, and ease out of the dive.

SPIRALS

A spiral is a steep descending turn in which the aircraft rapidly loses altitude while the airspeed rapidly increases.

The characteristics of a spiral include:

- excessive angle of bank,
- rapidly increasing airspeed, and
- rapidly increasing rate of descent.

The recovery process for a spiral is as follows:

1. Decrease power to idle and level the wings simultaneously with coordinated use of rudder and ailerons.
2. Ease out of the dive.
3. Apply power as required to maintain altitude.

A spiral is not a stalled condition. An improper recovery can cause an excessive load factor and lead to structural failure.

CONFIRMATION OF TEACHING POINT 4

QUESTIONS:

Q1. What must be exceeded in order for a stall to occur?

Q2. What does the stall speed do as the angle of bank in a turn is increased?

Q3. What is the difference between a spin and a spiral?

ANTICIPATED ANSWERS:

A1. The critical angle of attack.

A2. The stall speed increases.

A3. A spin is a stalled condition and has a constant airspeed. A spiral is not a stalled condition and has a rapidly increasing airspeed.

Teaching Point 5 **Explain airspeed limitations.**

Time: 5 min Method: Interactive Lecture

To reduce the risk of structural failure from an excessive load factor, airplane manufacturers publish a number of airspeed limitations in the POH.

Never exceed (maximum permissible dive) speed (V_{NE}). The maximum airspeed at which the airplane may be operated in smooth air.

Maximum structural cruise (normal operating limit) speed (V_{NO}). The maximum cruise airspeed at which the airplane was designed to operate.

Manoeuvring speed (V_A). The maximum airspeed at which the flight controls can be fully deflected without causing structural damage.

Maximum gust intensity speed (V_B). The maximum airspeed for penetration of gusts of maximum intensity. For most light airplanes V_A and V_B are the same.

Maximum flaps extended speed (V_{FE}). The maximum airspeed at which the airplane may be operated with the flaps extended.

CONFIRMATION OF TEACHING POINT 5

QUESTIONS:

Q1. What does V_{NE} specify?

Q2. What is the maximum airspeed at which the flight controls can be fully deflected?

Q3. What does V_{FE} specify?

ANTICIPATED ANSWERS:

A1. The maximum airspeed at which the airplane may be operated in smooth air.

A2. V_A.

A3. The maximum airspeed at which the airplane may be operated with the flaps extended.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. What happens to the load factor in a turn?

Q2. What are the characteristics of a spiral?

Q3. What is the maximum cruise airspeed at which the airplane was designed to operate?

ANTICIPATED ANSWERS:

A1. The load factor increases.

A2. The characteristics of a spiral include:

- excessive angle of bank,
- rapidly increasing airspeed, and
- rapidly increasing rate of descent.

A3. V_{NO}.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Future aviation training and instructional duties depend on knowledge of left turning tendencies, climbs, glides, turns, stalls, spins, spirals and airspeed limitations.

INSTRUCTOR NOTES / REMARKS

Cadets who are qualified Advanced Aviation may assist with this instruction.

REFERENCES

C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Peppler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.

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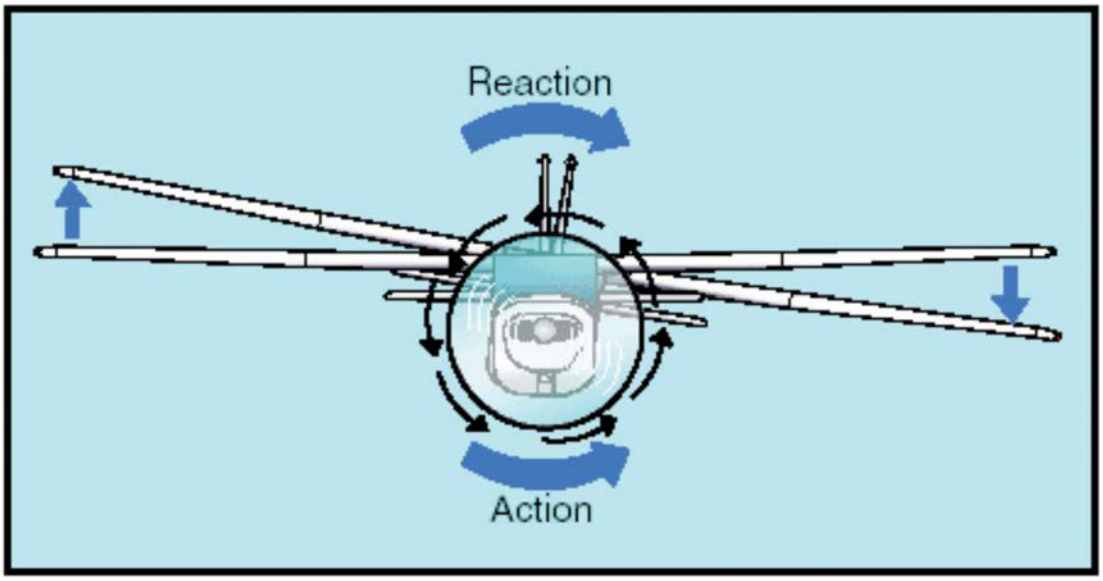

Figure A-1 Torque Reaction

Note. From "Propeller Aerodynamics", *Free Online Private Pilot Ground School*. Retrieved November 6, 2008, from http://www.free-online-private-pilot-ground-school.com/propeller-aerodynamics.html

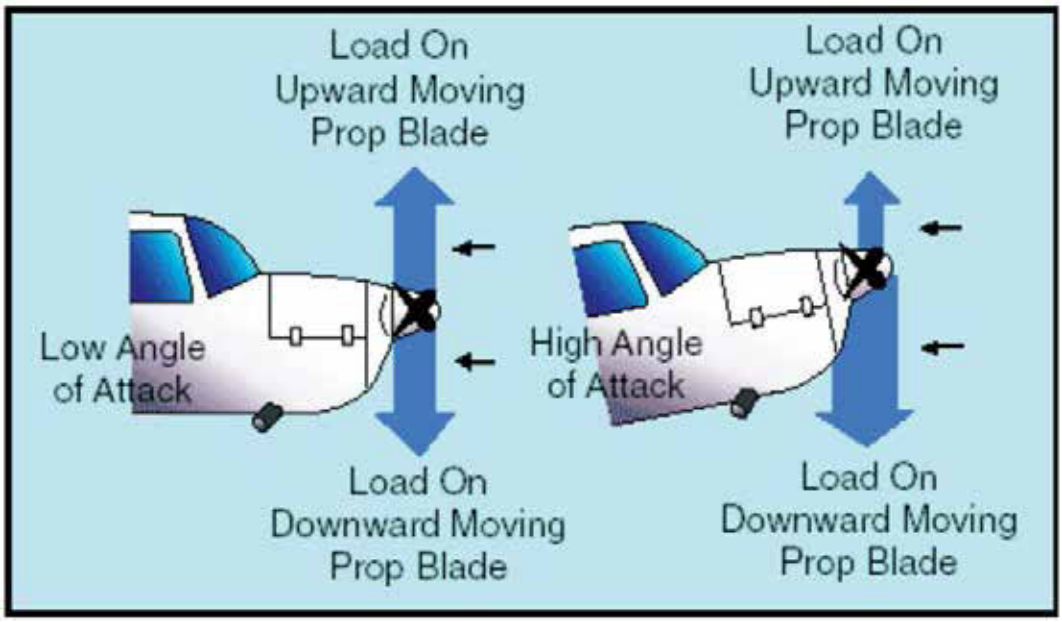

Figure A-2 Asymmetric Thrust (P Factor)

Note. From "Propeller Aerodynamics", *Free Online Private Pilot Ground School*. Retrieved November 6, 2008, from http://www.free-online-private-pilot-ground-school.com/propeller-aerodynamics.html

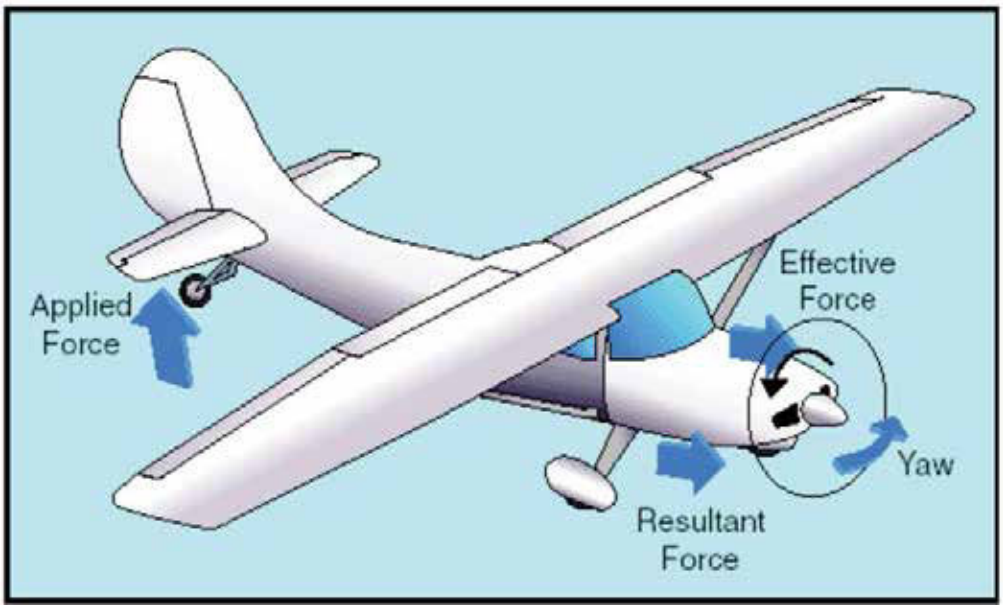

Figure A-3 Precession When the Tail is Lifted

Note. From "Propeller Aerodynamics", *Free Online Private Pilot Ground School*. Retrieved November 6, 2008, from http://www.free-online-private-pilot-ground-school.com/propeller-aerodynamics.html

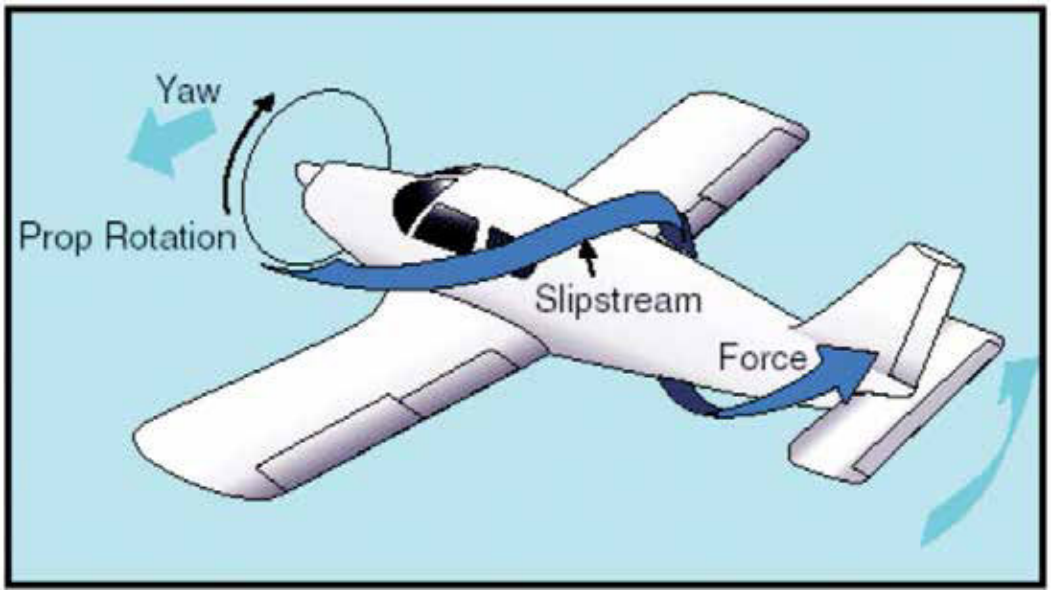

Figure A-4 Slipstream

Note. From "Propeller Aerodynamics", *Free Online Private Pilot Ground School*. Retrieved November 6, 2008, from http://www.free-online-private-pilot-ground-school.com/propeller-aerodynamics.html

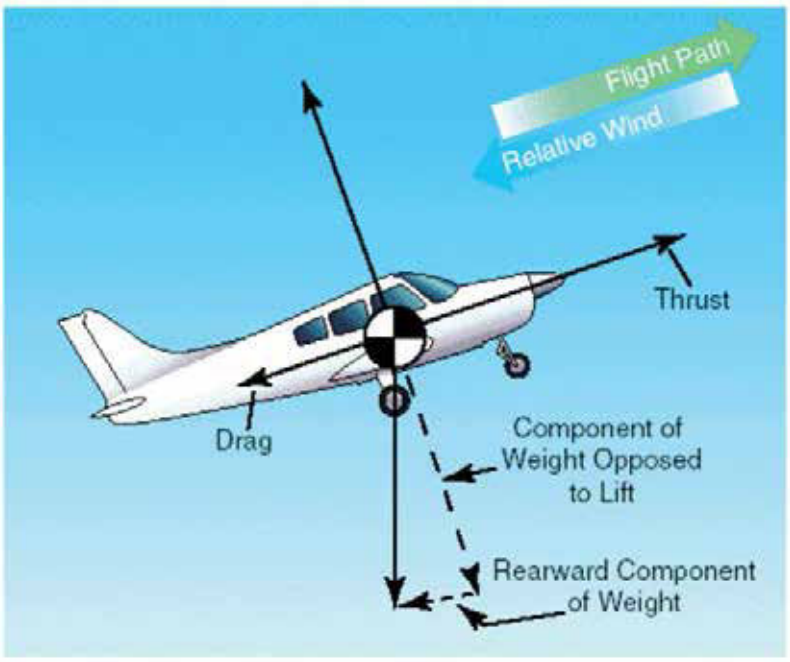

Figure A-5 Forces in a Climb

Note. From "Aerodynamics in Flight", *Free Online Private Pilot Ground School*. Retrieved November 6, 2008, from http://www.free-online-private-pilot-ground-school.com/Aerodynamics_in_flight.html

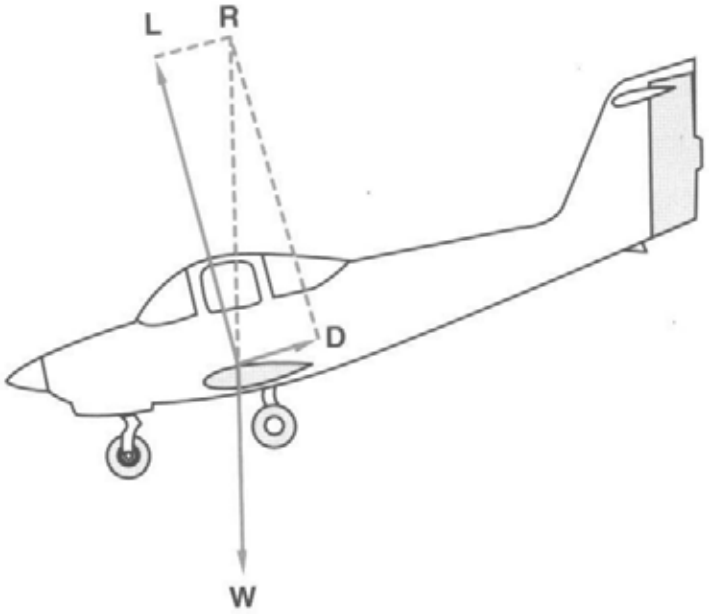

Figure A-6 Forces in a Glide

Note. From *From the Ground Up: Millennium Edition* (p. 34), by A. F. MacDonald and I. L. Peppler, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

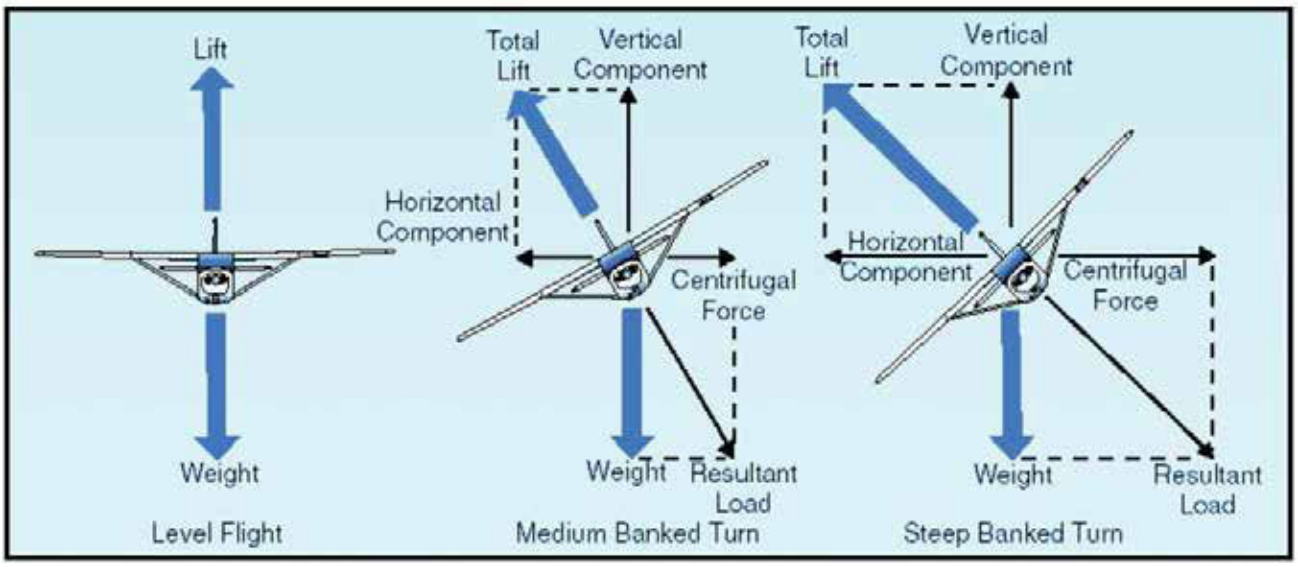

Figure A-7 Forces in a Turn

Note. From "Aerodynamics in Flight", *Free Online Private Pilot Ground School*. Retrieved November 6, 2008, from http://www.free-online-private-pilot-ground-school.com/Aerodynamics_in_flight.html

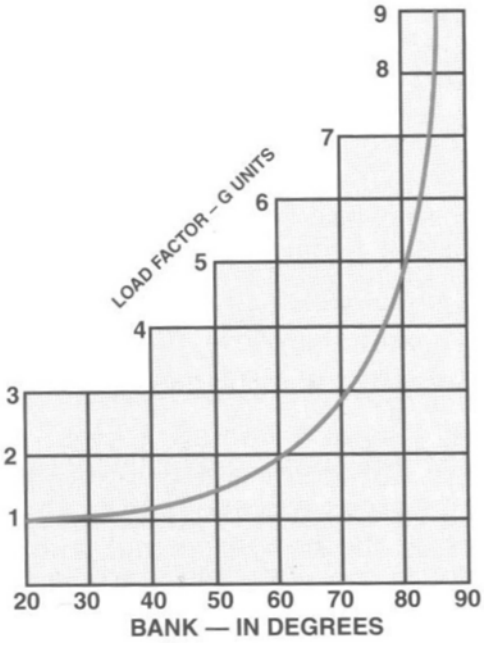

Figure A-8 Load Factors in Turns

Note. From *From the Ground Up: Millennium Edition* (p. 35), by A. F. MacDonald and I. L. Peppler, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

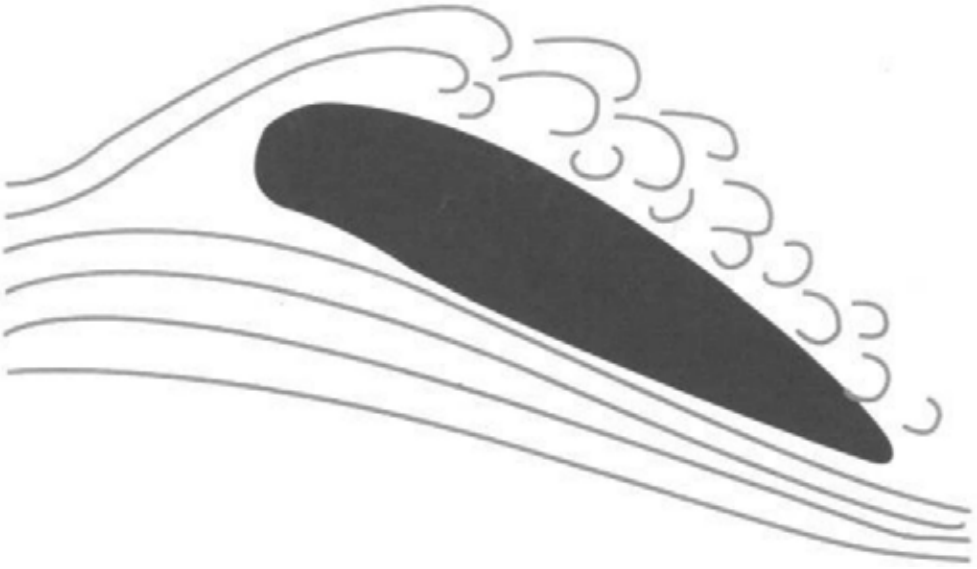

Figure A-9 Stall

Note. From *From the Ground Up: Millennium Edition* (p. 35), by A. F. MacDonald and I. L. Peppler, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

STALL SPEED, POWER OFF			
GROSS WEIGHT ***2800 LBS.***	ANGLE OF BANK		
CONFIGURATION	0°	30°	60°
FLAPS UP	64	69	91
FLAPS 20°	57	61	81
FLAPS 40°	55	59	78

Figure A-10 Stall Speed in Turns

Note. From *From the Ground Up: Millennium Edition* (p. 35), by A. F. MacDonald and I. L. Peppler, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

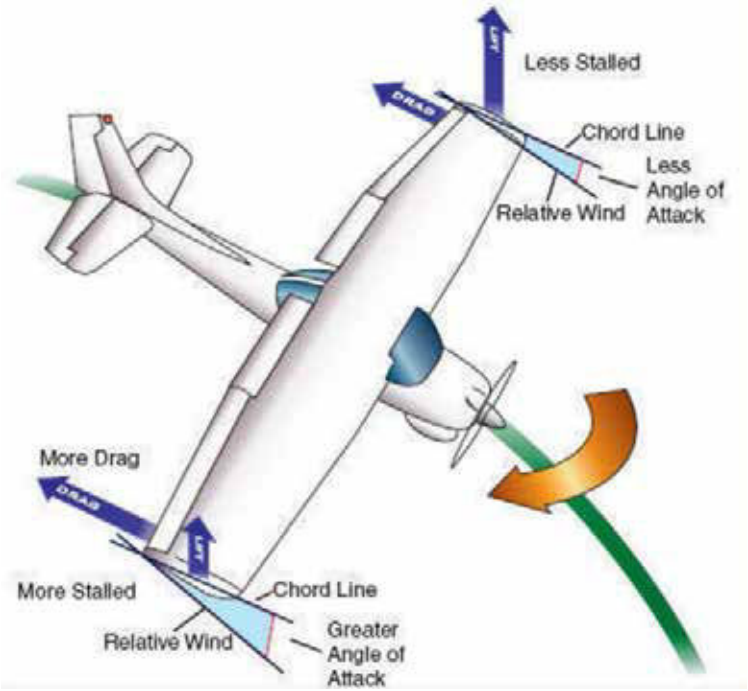

Figure A-11 Spin

Note. From "What is a Spin?", *Over the Airwaves*. Retrieved November 12, 2008, from http://overtheairwaves.com/Vol3-111.jpg

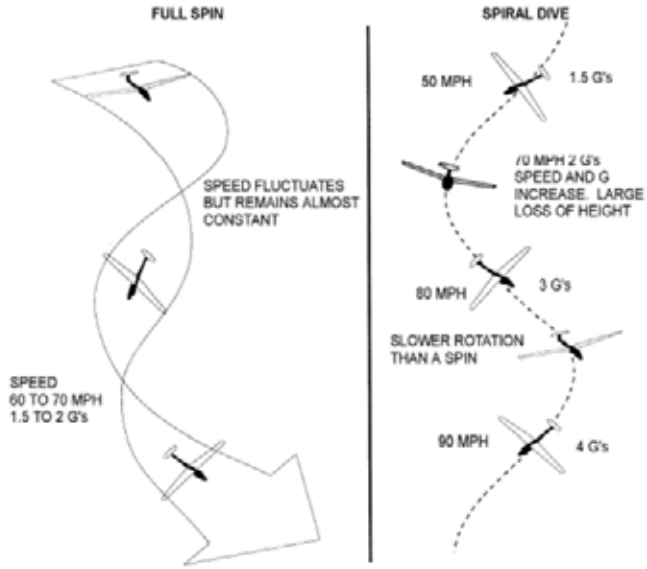

Figure A-12 Spin and Spiral Recognition

Note. From *Air Cadet Gliding Program Manual* (p. 6-6-4), by Air Force Training, 2009, Ottawa, ON: Department of National Defence.

ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 4

EO C431.02 – DEMONSTRATE TURNS, CLIMBS AND DESCENTS IN A FLIGHT SIMULATOR

Total Time: 90 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Photocopy the handouts located at Attachments A and B for each cadet.

Create a scenario (eg, location, weather, aircraft) for the aircraft flight simulator IAW the manual provided with the software.

Set up the simulator with the scenario created.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TPs 1 and 2 to give direction on procedures and present basic or background information about flight simulation.

A demonstration and performance was chosen for TP 3 as it allows the instructor to explain and demonstrate turns, climbs and descents in a flight simulator while providing an opportunity for the cadets to practice the skills under supervision.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have demonstrated turns, climbs and descents in a flight simulator.

IMPORTANCE

It is important for cadets to demonstrate turns, climbs and descents in a flight simulator to develop a better understanding of the principles of flight and stimulate an interest in aviation. This will also serve as a solid foundation for any cadet who participates in a demonstration flight or flying training in the future.

Teaching Point 1 **Explain any safety considerations related to the location or design of the flight simulator.**

Time: 5 min Method: Interactive Lecture

Arrange the cadets so they can hear the safety briefing prior to using the flight simulator.

This briefing is being conducted to pass on safety considerations for use of the flight simulator. The actual content of the briefing will vary by region and squadron based on the squadron assets, the location of the assets, and other environmental factors. However, the following should be covered:

- DND regulations concerning the appropriate use of computers, including:
  - CATO 11-07, *Internet Acceptable Use–Cadet Program*,
  - DAOD 6001, *Internet*, and
  - Regional Orders;
- location of the nearest fire exit in case of fire,
- awareness of any moving parts of the simulator, and
- proper entry and exit techniques to avoid damage to assets.

CONFIRMATION OF TEACHING POINT 1

Confirmation questions for this TP will depend on the content covered.

Teaching Point 2 **Explain how to manipulate the necessary control inputs and the location of necessary instruments.**

Time: 10 min Method: Interactive Lecture

NECESSARY CONTROL INPUTS

Control Column or Yoke

Using a control yoke in a flight simulator is preferable. Accordingly, the following will need to be adjusted if a control column is used instead.

The control yoke is located directly in front of the pilot in the centre of the pilot's side of the instrument panel. The control yoke is very much like the steering wheel of a car, both in look and function. The yoke is designed to move on two planes of motion.

The first plane of motion is left and right. The control yoke will usually move to approximately 45 degrees left or right of centre when moved like a steering wheel. This motion is what controls the ailerons of the simulated airplane. To roll left, turn the yoke left. To roll right, turn the yoke right. Remember, this must be used as well as the rudder in order to properly turn the aircraft.

The control yoke also moves back and forth. The steering column of the yoke moves in and out of the main assembly. This controls the elevator of the simulated aircraft. To pitch up, pull back (towards the pilot). To pitch down, push forward (away from the pilot).

Pitch will change the altitude, but more importantly the airspeed.

Rudder Pedals

On the floor of the simulator there are two pedals. If the left pedal is pushed forward, the right one moves back and vice versa. These pedals control the rudder of the simulated aircraft. To yaw left, push on the left pedal. To yaw right, push on the right pedal.

Rudder pedals move in different directions so pressure must be taken off the opposite pedal in order for the movement to take place.

LOCATION OF NECESSARY INSTRUMENTS

Distribute the handout located at Attachment A to each cadet.

The instruments of the simulated aircraft will be displayed in front of the pilot, laid out above the control yoke on what is called an instrument panel. The four instruments that are of significance are the airspeed indicator (ASI), vertical speed indicator (VSI), altimeter, and turn coordinator.

ASI. Shows an aircraft's speed through the air.

VSI. Shows the rate at which an aircraft is ascending or descending.

Altimeter. Shows the altitude of an aircraft.

Turn Coordinator. Shows rate of roll as well as the rate of turn of the aircraft.

Function of the ASI, VSI, altimeter and turn coordinator was discussed in M431.02 (Describe Flight Instruments).

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. Where is the control yoke located?

Q2. Where are the instruments located?

Q3. How is pitch controlled?

ANTICIPATED ANSWERS:

A1. Directly in front of the pilot in the centre of the pilot's side of the instrument panel.

A2. In front of the pilot, laid out above the control yoke on what is called an instrument panel.

A3. By moving the yoke towards or away from the pilot.

Teaching Point 3 **Explain, demonstrate and have the cadets practice turns, climbs and descents using a flight simulator.**

Time: 70 min Method: Demonstration and Performance

ACTIVITY

OBJECTIVE

The objective of this activity is to allow the cadets to practice turns, climbs and descents and witness their effect on the pitot static instruments and the turn coordinator.

RESOURCES

- flight simulator (Microsoft flight simulator, computer, control yoke, and rudder pedals; or Link),
- scenario using a local airport, no weather, and positioned 1 000 feet above ground level (AGL), and
- Climbs, Turns and Descents Handout located at Attachment B.

ACTIVITY LAYOUT

Training should be conducted for a light training single engine aircraft such as:

- a Cessna 172, or
- a Piper J-3C-65 Cub.

This will depend on the location of the flight simulator.

ACTIVITY INSTRUCTIONS

1. Start the simulator with the scenario created prior to the lesson.
2. Using the flight simulator, explain and demonstrate turns, climbs and descents by climbing to 5 000 feet AGL, making turns and descending to 1 000 feet AGL.

Specific details on how to conduct turns, climbs and descents can be found in:

- the Transport Canada *Flight Training Manual*,
- the *Computerized Aircraft Simulation Center*,
- the Pilots Operating Handbook (POH), and / or
- the operating instructions for the flight simulator program.

3. Distribute the handout located at Attachment B to each cadet. The handout reflects the sequence in which the instructor will explain and demonstrate turns, climbs and descents.
4. Have the cadets take turns in the flight simulator, practicing turns, climbs and descents as demonstrated.
5. Give each cadet verbal and physical assistance as necessary as they practice turns, climbs and descents.
6. Provide each cadet an equal amount of time. This means that the 70 minutes should be divided as evenly as possible based on the number of cadets in the class and the number of flight simulators available.
7. Debrief each cadet as they finish their individual flight. The debrief should include the following:
   a. the overall performance of the cadet,
   b. the sequences where the cadet performed strongly,
   c. the sequences where the cadet performed weakly, and
   d. how to improve their performance.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 3

The cadets' participation in the activity will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' participation in practicing turns, climbs and descents in the flight simulator will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

It has been stated by many flight instructors that a significant difference can be seen in the quality of students who used a flight simulator compared to those who did not. The military is a large user of computer-based flight simulators, as are Air Canada and WestJet. Continued training on flight simulators will enhance preparation for future flight training.

INSTRUCTOR NOTES / REMARKS

All staff should be familiarized with the operation of the flight simulator prior to the cadets arriving. This will allow them to troubleshoot, and give them a better perspective for instructing.

Additional instructors are required for this lesson. There should be one instructor per two flight simulators.

Cadets who are qualified Advanced Aviation may assist with this instruction.

REFERENCES

C3-139 ISBN 0-7715511-5-0 Transport Canada. (1999). *Flight training manual 4th edition revised*. Ottawa, ON: Transport Canada.

C3-156 *Computerized Aircraft Simulation Center*. (2007). Retrieved October 2, 2007, from http://www.regions.cadets.forces.gc.ca/pac/aircad/flight/casc_lessons_e.asp

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Figure A-1 Cessna Flight Instrument Panel

Note. From "Design a Virtual Cockpit Instrument Panel", Ngee Ann Polytechnic, 2007. Retrieved October 31, 2007, from http://www.learnerstogether.net/avionics-project-design-problem-based-learning/56

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CLIMBS, TURNS AND DESCENTS HANDOUT

The handout is presented to reflect the sequence in which the instructor will explain and demonstrate climbs, turns and descents.

CLIMBS

Climbs are executed by doing the following:

1. Adjust the pitch angle to obtain climb airspeed.
2. Increase the power to maintain airspeed.
3. Climb to the desired altitude.
4. Upon reaching the desired altitude, resume a level attitude and adjust power to maintain altitude and airspeed.
5. For any climb, follow the sequence: attitude, power, trim (APT).

TURNS

Turns are executed by doing the following:

1. Look out from the outside to the inside of the turn. A good look out is the most important part of airmanship as is essential for safe flying.
2. Roll the airplane in the desired direction, using the rudder to stay coordinated. Stay coordinated by "stepping on the ball" of the turn coordinator. That is, if the ball of the turn coordinator is to the right, apply more right rudder and vice versa.
3. Once the desired angle of bank has been reached, reduce the yoke input as required to maintain that angle of bank.

Gentle turn. A turn with up to 15 degrees angle of bank.

Medium turn. A turn with approximately 30 degrees angle of bank.

Steep turn. A turn with at least 45 degrees angle of bank. When executing a steep turn, as the angle of bank passes 30 degrees, back-stick pressure must be applied to maintain attitude and altitude. The power setting must be increased to maintain altitude.

DESCENTS

Descents are executed by doing the following:

1. Decrease power, adjust the attitude to reach and maintain the descent speed, and adjust the trim.
2. For any descent, follow the sequence: power, attitude, trim (PAT).
3. Upon reaching the desired altitude, resume a level attitude and adjust power to maintain altitude and airspeed.

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ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 5

EO C431.03 – FLY A RADIO-CONTROLLED AIRCRAFT

Total Time:	90 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Construct and / or assemble a radio-controlled aircraft for use by cadets.

Charge multiple batteries for use with radio-controlled aircraft.

Assistant instructors are required for this lesson.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

A practical activity was chosen for this lesson as it is an interactive way to introduce the cadets to flying a radio-controlled aircraft in a safe and controlled environment. This activity contributes to the development of skills and knowledge in a fun and challenging setting.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have flown a radio-controlled aircraft.

IMPORTANCE

It is important for cadets to fly a radio-controlled aircraft as it provides an opportunity to apply the principles of flight in a fun and practical way.

Teaching Point 1 **IAW the instructions supplied with the radio-controlled aircraft and the Model Aeronautics Association of Canada (MAAC) safety code, have the cadet fly a radio-controlled aircraft.**

Time: 80 min Method: Practical Activity

BACKGROUND KNOWLEDGE

Radio-Controlled Aircraft

Radio-controlled aircraft are more complicated and expensive than free-flight gliders or rubber-powered airplanes. They are an exciting way to apply the principles of flight in a practical way. They can be scratch-built from plans, built from kits, assembled from almost-ready-to-fly (ARF) kits, or assembled from ready-to-fly (RTF) packages.

Small, light-weight, electric-powered helicopters are also a viable alternative to a conventional radio-controlled airplane. They are available in different sizes in RTF packages and can be flown indoors in smaller spaces than required by an airplane. Most micro-helicopters on the market use counter-rotating main rotors that make a stable, easy-to-hover helicopter.

The Blade CX Series (CX, CX2, CX3 and MCX), from E-Flite are among the most popular entry-level helicopters. They come in an RTF package and include a radio transmitter-receiver combination that allows multiple aircraft to operate at the same time without interference.

Figures 1 and 2 show the Blade CX2 and Blade MCX, respectively.

When learning to operate a radio-controlled helicopter, it is recommended that a training gear set is attached to the landing skids to reduce rollovers as shown in Figure 3.

Ensure that there is an ample supply of spare parts (blades, shafts, and heads) available to repair any damages caused by a crash.

Having multiple batteries available (a minimum of three per helicopter) minimizes the time spent waiting while batteries are recharging.

Figure 1 Blade CX2

Note. From “Horizon Hobby”, *E-Flite Blade CX2*. Retrieved November 5, 2008, from http://www.horizonhobby.com/Products/Gallery.aspx?ProdID=EFLH1250&Index=0

Figure 2 Blade MCX

Note. From “Horizon Hobby”, *E-Flite Blade MCX*. Retrieved November 5, 2008, from http://www.horizonhobby.com/Products/Gallery.aspx?ProdID=EFLH2200&Index=4

Figure 3 Blade CX2 With Training Gear Installed

Note. From “Elite Models”, *Blade CX2*. Retrieved November 5, 2008, from http://www.elitemodelsonline.co.uk/Products/Helicopters/Helicopters+Spares/E-Flite/Blade+CX2

A radio-controlled airplane can be built easily and quickly from common materials such as corrugated plastic (commonly used for signs) and polyvinyl chloride (PVC) downspout. These simple plastic airplane designs (SPADs) are inexpensive and durable.

Information and free plans for SPADs can be found at http://www.spadtothebone.com

The Debonair is designed to be used as a trainer and is shown at Figure 4.

Figure 4 SPAD Debonair

Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

RTF packages (containing an airframe, engine or motor, radio gear, and hardware) can be assembled in a few hours and generally contain almost everything needed to go flying except for field items such as:

- glue,
- starting equipment, and
- fuel / batteries.

Figure 5 and 6 shows examples of an RTF aircraft suitable for first-time fliers. The Vapor Bind-N-Fly model also comes as the Vapor RTF model which includes the radio transmitter and is for indoor flying only.

Figure 5 Alpha 40 DSM2 RTF

Note. From “Hangar 9”, *Alpha 40 DSM2 RTF*. Retrieved November 5, 2008, from http://www.hangar-9.com/Products/Default.aspx?ProdID=HAN4400

Figure 6 Vapor Bind-N-Fly

Note. Created by Director Cadets 3, 2008, Ottawa, ON: Department of National Defence.

Computer simulators for radio-controlled aircraft are available and can be used to provide training in a safe and controlled environment without having to worry about the cost and time associated with repairing an aircraft after a crash.

Most of the simulators available come with a "transmitter" that is almost identical to the ones used for real radio-controlled aircraft that plug into the computer through a USB port, and a set of CDs / DVDs to install the program.

Testimonials from many people indicate the number and severity of crashes are reduced by spending time on the simulator prior to flying the radio-controlled aircraft. Additionally, most simulators have many different radio-controlled aircraft included, which allows the pilot to experiment with various aircraft types.

Popular radio-controlled aircraft simulators include:

- RealFlight (Knife Edge Software), and
- FS One (Hangar 9).

ACTIVITY

OBJECTIVE

The objective of this activity is to have the cadets fly a radio-controlled aircraft.

RESOURCES

If an aircraft has to be constructed before flying, complete by:

- setting up a desk or table for each cadet (or group of cadets);
- placing the required construction and / or assembly tools and materials on the tables;
- showing a completed model aircraft to the cadets;
- describing the parts and components of the model aircraft to the cadets; and
- having the cadets construct and / or assemble the model aircraft IAW the plans and / or instructions.

- Radio-controlled aircraft,
- Starting equipment,
- Fuel / batteries,
- Battery charger, and
- Transmitter.

ACTIVITY LAYOUT

Large indoor area (eg, gymnasium or drill hall) or a large outdoor area for flying a radio-controlled aircraft IAW regulations and safety guidelines set out by Model Aeronautics Association of Canada (MAAC).

ACTIVITY INSTRUCTIONS

1. Demonstrate to the cadets how to fly the radio-controlled aircraft to include:
   a. taking off;
   b. flying a circuit; and
   c. landing.
2. Have the cadets fly the radio-controlled aircraft IAW the plans and / or the instructions.

SAFETY

Assistant instructors will monitor the cadets to ensure they are following the instructor's directions and using all equipment safely.

All radio-controlled aircraft activities shall be conducted IAW the regulations and safety guidelines set out by MAAC.

Flying a radio-controlled aircraft should not be attempted without assistance from an experienced radio-controlled aircraft pilot. A list of MAAC sanctioned clubs can be found at http://www.maac.ca/clubs/maac_clubs_map.php.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in this activity will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' participation in flying a radio-controlled aircraft will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Flying a radio-controlled aircraft is a fun and challenging way to apply the principles of flight.

INSTRUCTOR NOTES / REMARKS

It is recommended that the three periods required for this EO be scheduled consecutively.

The radio-controlled aircraft can be flown individually or in small groups of two to four cadets.

Assistant instructors are required for this lesson.

Suitable model aircraft may be chosen from the following:

- Blade CX2 / CX3 (radio-controlled electric helicopter),
- Blade MCX (radio-controlled electric helicopter),
- SPAD Debonair (radio-controlled airplane),
- Alpha 40 DSM2 RTF (radio-controlled airplane),
- Vapor Bind-N-Fly / RTF(radio-controlled airplane), and / or
- an alternate choice (or choices) selected by the squadron.

The helicopter being selected should have the counter-rotating rotor system with a 2.4 GHz radio transmitter.

Radio-controlled aircraft simulators such as RealFlight (Knife Edge Software) or FS One (Hangar 9) that run on a personal computer can also be used.

REFERENCES

C3-303 Model *Aeronautics Association of Canada Safety Code*. (2008). Retrieved February 5, 2009, from http://www.maac.ca/docs/2007/maac_safety_code_v008sept30_08_english.pdf

ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 1

EO M432.01 – DESCRIBE FUEL SYSTEMS

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Prepare slides located at Attachment A.

Photocopy the handout located at Attachment B for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to clarify, emphasize, and summarize fuel systems.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have described fuel systems.

IMPORTANCE

It is important for cadets to be able to describe fuel systems as a solid understanding of fuel systems provides knowledge for potential instructional duties and is part of the fundamentals that cadets pursuing future aviation training will require.

Teaching Point 1 **Describe fuel systems.**

Time: 10 min Method: Interactive Lecture

THE FUEL SYSTEM

An aircraft fuel system stores and delivers the proper amount of fuel for all phases of flight, including:

- normal flight,
- violent manoeuvres,
- sudden acceleration, and
- sudden deceleration.

Fuel systems include the following parts:

- fuel tanks,
- a fuel selector valve,
- fuel lines and filters,
- a fuel quantity gauge, and
- fuel primer.

Pressure-Feed System

Show slide of Figure A-1 to the cadets.

Aircraft with low-wing configurations and large aircraft with a large volume of fuel movement use an engine-driven fuel pump to provide the pressure to keep fuel flowing. This system includes:

- the basic pump,
- auxiliary electric pumps for emergency situations,
- a booster pump to create the pressure required to start the fuel flowing before the engine is running, and
- the pressure gauge mounted on the cockpit panel used to read the pressure of fuel entering the carburetor.

Gravity-Feed System

Show slide of Figure A-2 to the cadets.

High-wing, low-powered light aircraft use the gravity-feed system. The bottom of the fuel tank in the wing must be high enough to provide pressure for the fuel to travel past the fuel selector to the carburetor.

Fuel Selector Valve

The fuel selector valve is used by the pilot to select the desired fuel tank to draw fuel. The selector valve may also be used to shut off the flow of fuel from the tanks.

A fuel selector valve can be operated manually or electrically depending of the installation.

FUEL

Aviation fuel has been specially formulated for use in aircraft. It is available in several different types / grades. The approved fuel types are specified in the pilot operating handbook.

Fuel Types

Fuel used in modern high compression engines must burn slowly and expand evenly rather than explode quickly (detonation). High octane fuels meet this requirement. The octane rating of fuels is calculated by the ratio of octane and heptane.

Octane. A substance which possesses minimum detonating qualities.

Heptane. A substance which possesses maximum detonating qualities.

Show slide of Figure A-3 to the cadets.

Proportion of octane to heptane is expressed as a percentage. For example 73 octane means 73 percent octane and 27 percent heptane.

Higher octane fuels are treated with sulphuric acid, lye, etc, used to remove the gum, acid, and other impurities.

Octane numbers can only go as high as 100. Beyond this, the performance number is the anti-knock value of the fuel for octane numbers above 100. Fuel grades are expressed by two performance numbers the first number indicates octane rating at lean mixture conditions, and the second number indicates octane rating at rich mixture condition.

Grade 100 / 130 indicates:

- lean mixture performance number of 100, and
- rich mixture performance number of 130.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What fuel-feed system does an aircraft with low-wing configuration use?

Q2. For what is the fuel selector valve used?

Q3. How are octane ratings of fuels calculated?

ANTICIPATED ANSWERS:

A1. An aircraft with low-wing configuration uses a pressure-feed system.

A2. The fuel selector valve is used by the pilot to select the desired fuel tank to draw fuel. The selector valve may also be used to shut off the flow of fuel from the tanks.

A3. Octane ratings of fuels are calculated as a ratio of octane and heptane.

Teaching Point 2 **Describe carburetors.**

Time: 10 min Method: Interactive Lecture

CARBURETORS

Show slide of Figure A-4 to the cadets.

The heat energy in an internal combustion engine is developed from the burning of a mixture of gasoline and air. The carburetor measures the correct quantity of gasoline, vaporizes fuel, mixes it with the air in the required proportion and delivers the mixture to the cylinder when the combustion occurs.

An engine will run hotter with a lean mixture than a rich mixture as the lean mixture will burn slower and the cylinder walls are exposed to high heat for a longer time. A rich mixture burns quickly exposing the cylinder walls to high temperatures for a shorter time and the additional fuel in the fuel / air mix cools the engine.

The carburetor involves numerous complex devices to control the mixture ratio. Two types of carburetors used, include float carburetor, or pressure carburetor.

Float Carburetor

Show slide of Figure A-5 to the cadets.

Fuel flows through the fuel lines, enters the carburetor at the float valve and into the float chamber. A needle attached to the float, resting on the fuel within the chamber, opens and closes an opening at the bottom of the carburetor bowl. The float chamber is vented so the atmospheric and chamber pressure equalizes as the aircraft climbs and descends.

Air flows through an air filter usually located at an air intake in the front part of the engine cowling. The filtered air flows into the carburetor through a venturi (narrow throat in the carburetor). The air speed increases, creating a low pressure area which draws fuel at atmospheric pressure.

The air and vaporized fuel is regulated, in volume, by the throttle valve, enters the intake manifold and is distributed to the individual cylinders. The pilot is able to control the amount of fuel / air mixture from within the cockpit using the throttle control.

Forward movement of the throttle opens the throttle valve, which increases the fuel / air mixture, and increases the power being produced by the engine.

Aft movement of the throttle closes the throttle valve, which reduces the volume of fuel / air mixture, and decreases the power being produced by the engine.

Mixture Control

The correct fuel / air mixture will be obtained at sea level as carburetors are normally calibrated for sea level operation.

As altitude increases, the density of the air decreases and a given volume of air weighs less. The proportion of air by weight to that of fuel will become less although the volume remains the same. The mixture at higher altitude becomes over-rich causing fuel waste and loss of power.

A mixture control is fitted to the carburetor that adjusts the amount of fuel being drawn from the nozzle, restoring the proper fuel / air mix.

The general rules when using a manual mixture control are:

- rich mixtures—high power settings, and
- leaner mixtures—cruise power settings.

Carburetor Icing

Show slide of Figure A-6 to the cadets.

Distribute the handout located at Attachment B to each cadet.

With temperatures ranging from minus 5 degrees Celsius to plus 30 degrees Celsius and under certain moist atmospheric conditions, ice can form in the induction system closing off the flow of fuel to the engine. Ice can form on various surfaces of the carburetor especially on the throttle.

Show slide of Figure A-7 to the cadets.

Modern aircraft have incorporated a method of directing heated air into the carburetor air intake, activated by the carburetor hot air handle in the cockpit. This heated air can prevent ice from forming or melt ice that has already formed.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. How are the fuel / air proportions calculated?

Q2. What does the mixture control adjust?

Q3. What do modern aircraft have to melt ice that has formed?

ANTICIPATED ANSWERS:

A1. Fuel / air proportions are calculated by weight not volume.

A2. The mixture control adjusts the amount of fuel being drawn from the nozzle, restoring the proper fuel / air mix.

A3. Modern aircraft have incorporated a method of directing heated air into the carburetor air intake, activated by the carburetor hot air handle in the cockpit.

Teaching Point 3 **Describe fuel injection.**

Time: 5 min Method: Interactive Lecture

FUEL INJECTION

With a fuel injection system, a control valve supplies pressurized fuel continuously to the induction system near the intake valve. The fuel is vaporized and sucked into the cylinder during the intake stroke.

Advantages of fuel injection include:

- more uniform distribution of fuel to all cylinders,
- better cooling, through the elimination of lean hot mixtures to some of the more distant cylinders,
- fuel saving through uniform distribution,
- increased power since the heat carburetor air is eliminated, and
- elimination of the hazard of carburetor icing.

Throttle ice can occur when the temperature is less than 5 degrees Celsius.
Impact ice can gather in bends in the system, impact tubes, and air filter.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. What does the control valve do?

Q2. What are the advantages of fuel injection?

Q3. Where can impact ice gather?

ANTICIPATED ANSWERS:

A1. The control valve supplies pressurized fuel continuously to the induction system near the intake valve.

A2. Advantages of fuel injection include:

- more uniform distribution of fuel to all cylinders,
- better cooling, through the elimination of lean hot mixtures to some of the more distant cylinders,
- fuel saving through uniform distribution,
- increased power since the heat carburetor air is eliminated, and
- elimination of the hazard of carburetor icing

A3. Impact ice can gather in the system, impact tubes, and air filter.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. What fuel-feed system does a high-wing, low-powered light aircraft use?

Q2. Why is leaning the engine both practical and economical?

Q3. When can throttle ice occur?

ANTICIPATED ANSWERS:

A1. A high-wing, low-powered light aircraft uses a gravity-feed system.

A2. It results in:

- better fuel economy lowering the cost of operation,
- a smoother running engine,
- a more efficient engine giving higher indicated airspeeds and better aircraft performance,
- extended range of the aircraft at cruise,
- less spark plug fouling and longer life for spark plugs,
- more desirable engine temperatures, and
- cleaner combustion chambers and less chance of pre-ignition from undesirable deposits.

A3. Throttle ice can occur when the temperature is less than 5 degrees Celsius.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, Aviation Subjects–Combined Assessment PC.

CLOSING STATEMENT

Being able to describe fuel systems is important for understanding more complex material. A solid understanding of aero engines is required to pursue future aviation training.

INSTRUCTOR NOTES / REMARKS

Cadets who are qualified Advanced Aviation may assist with this instruction.

REFERENCES

C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Peppler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.

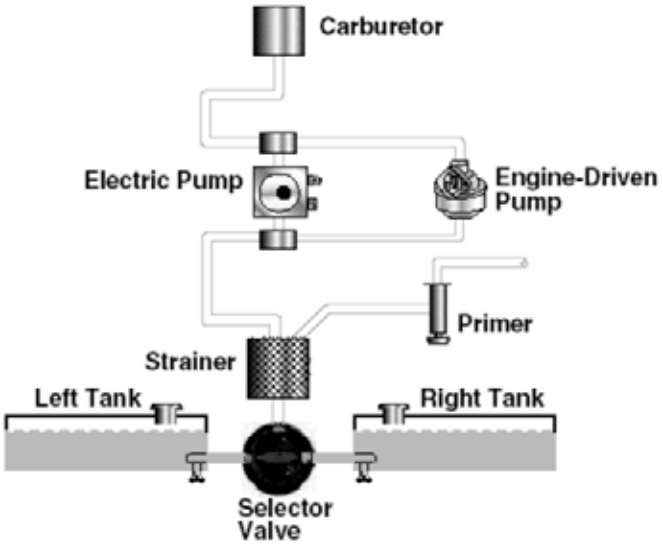

Figure A-1 Pressure-Feed System

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved November 24, 2008, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html

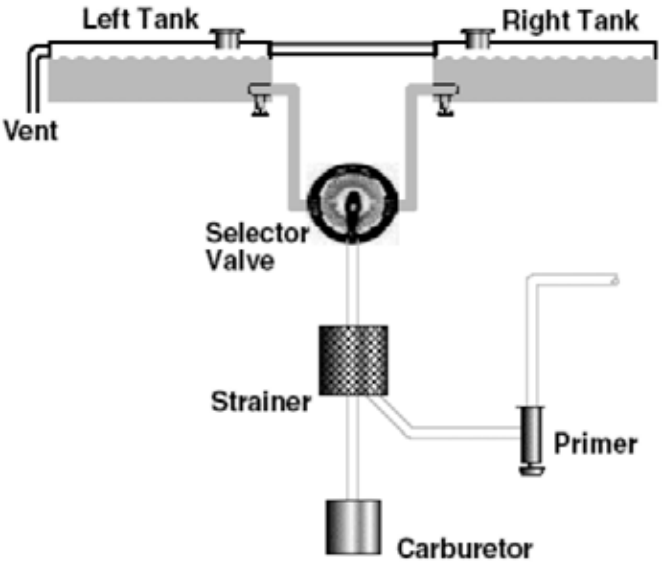

Figure A-2 Gravity-Feed System

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved November 24, 2008, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html

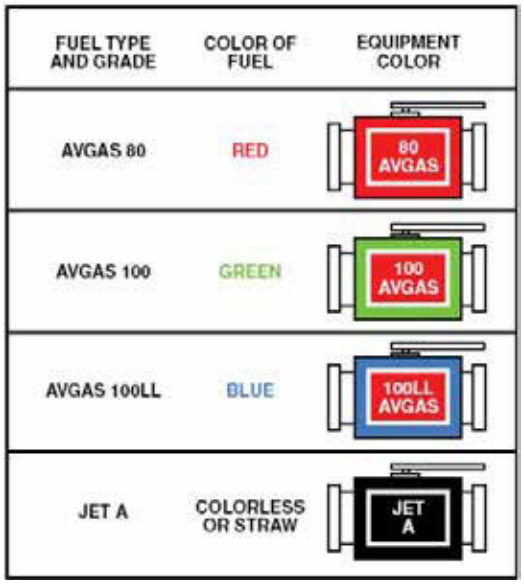

Figure A-3 Fuel Types

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved November 24, 2008, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html

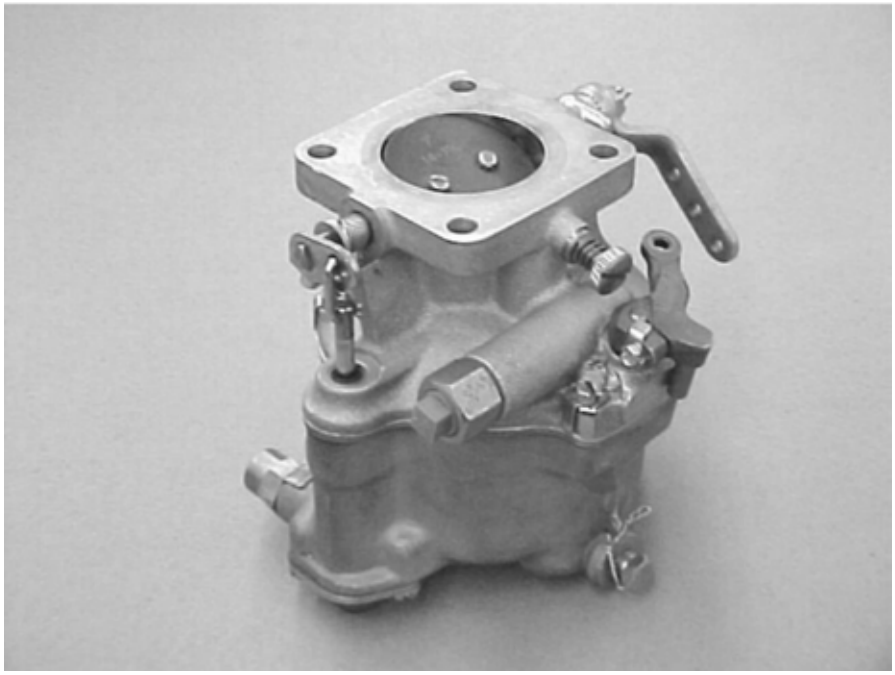

Figure A-4 Carburetor

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved November 24, 2008, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html

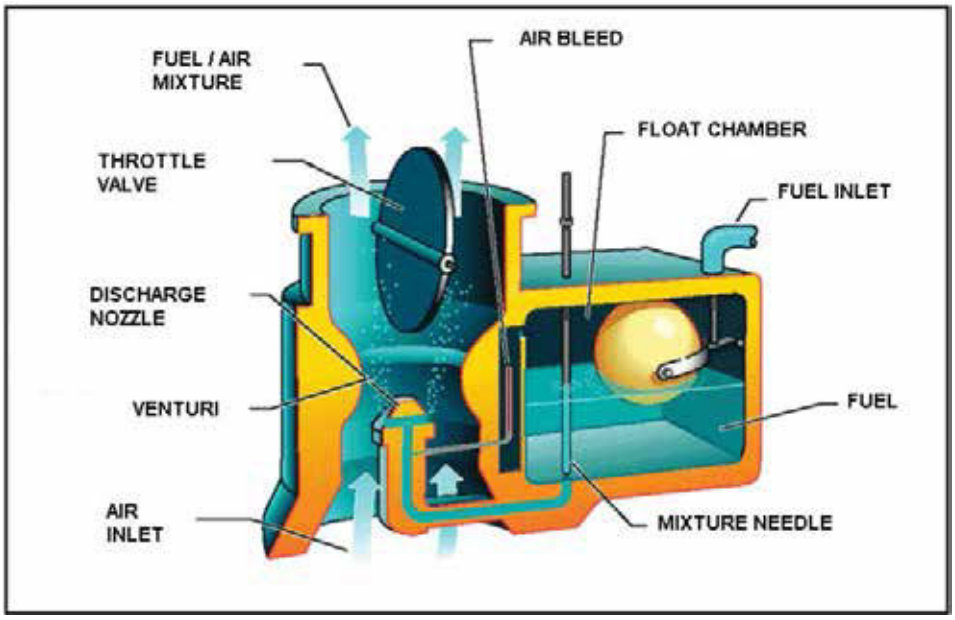

Figure A-5 Float-Type Carburetor

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved November 26, 2008, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html

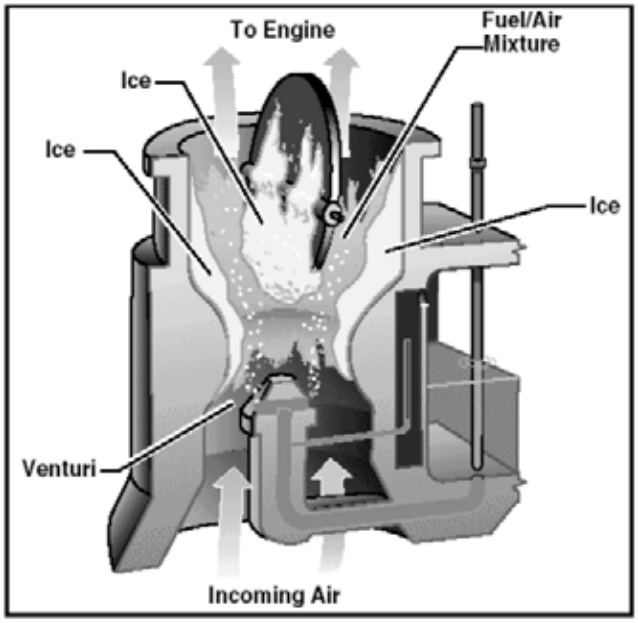

Figure A-6 Carburetor Icing

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved November 26, 2008, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html

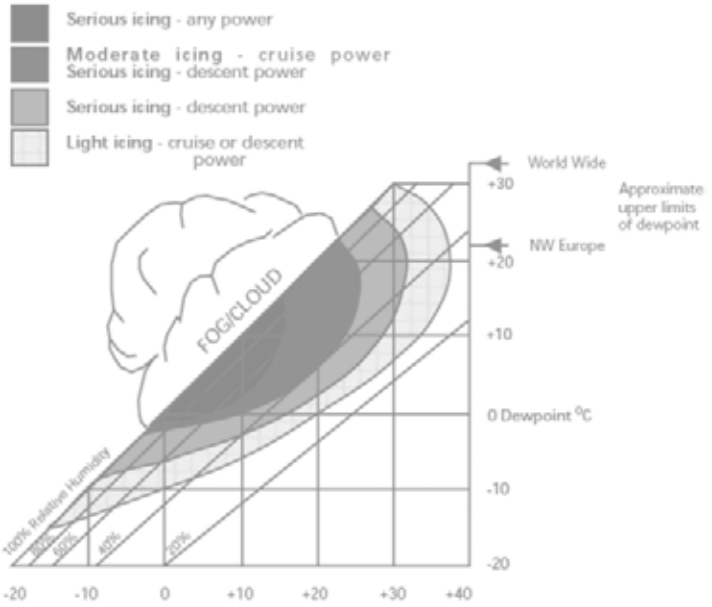

Figure A-7 Carburetor Icing Chart

Note. From "VAF Vansairforce.net", *The Truth about Carb Icing*, by J. Oldenkamp, 2006, Soonabe, Fl. Retrieved November 27, 2008, from *http*://www.vansairforce.com/community/showthread.php?t=9499

CARBURETOR STUDY HANDOUT

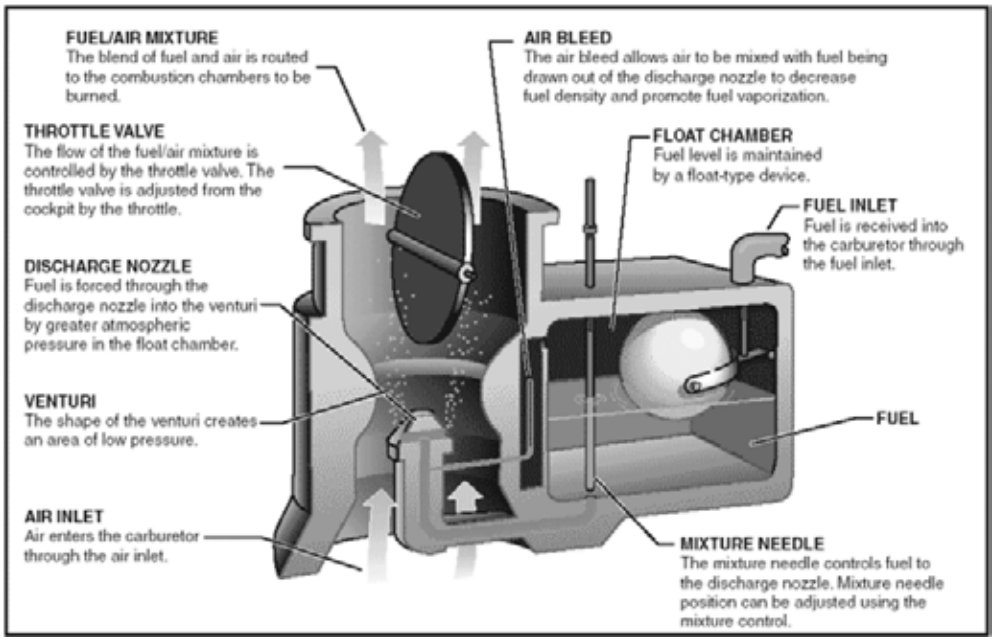

Figure B-1 Float-type Carburetor

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved November 26, 2008, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html

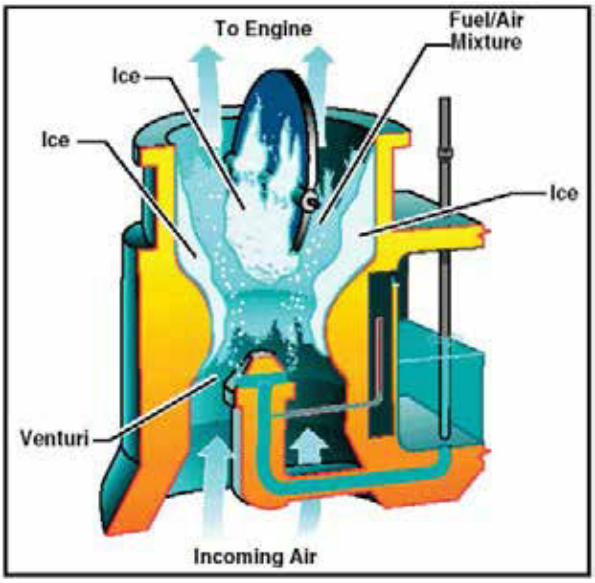

Figure B-2 Carburetor Icing

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved November 26, 2008, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html

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ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 2

EO M432.02 – DESCRIBE PROPELLER SYSTEMS

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Prepare slides located at Attachment A.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to clarify, emphasize, and summarize propeller systems.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have described propeller systems.

IMPORTANCE

It is important for cadets to be able to describe propeller systems as a solid understanding of propeller systems provides knowledge for potential instructional duties and is part of the fundamentals that cadets pursuing future aviation training will require.

Teaching Point 1 **Describe propeller systems.**

Time: 10 min Method: Interactive Lecture

The propeller provides the necessary thrust to pull, or in some cases push, the airplane through the air. The engine power rotates the propeller that generates thrust very similar to the manner in which a wing produces lift.

The propeller is a rotating airfoil designed to push air backward as it moves forward along a corkscrew (helical) path. It meets the air at an angle of attack as it rotates, producing thrust (lift) and torque (drag).

Propeller torque is different than engine crankshaft torque in that propeller torque is drag. It is the resistance to the blades as they rotate, resulting in a tendency in the aircraft to roll in a direction opposite to the rotation of the propeller. Engine crankshaft torque is the turning moment produced at the crankshaft. When the propeller is revolving at a constant rpm, propeller torque and engine torque will be exactly equal and opposite.

Show slide of Figure A-1 to the cadets.

A typical propeller is twisted so the blade angles and tapers from the hub to the tip. The highest angle of incidence (pitch) is at the hub and the smallest pitch is at the tip.

Show slide of Figure A-2 to the cadets.

By means of the variation in airfoil sections and the angle of attack, uniform thrust is maintained throughout most of the diameter of the propeller.

Show slide of Figure A-3 to the cadets.

Tractors are propellers attached forward of the engine that pull from the front of the aircraft.

Pushers are propellers attached aft of the engine that push from behind the aircraft.

Pitch. The distance in feet a propeller travels forward in one revolution. Propeller pitch is the difference between theoretical pitch (geometric pitch) and practical pitch (effective pitch).

Theoretical pitch. The distance travelled forward in one revolution if the propeller was working in a perfect fluid. This depends on the blade angle and diameter of the propeller.

Practical pitch. The distance the propeller travels in air in one revolution. The forward motion is less than theoretical pitch.

The angle of the blade, like the angle of incidence of a wing, governs the pitch. The propeller set in coarse pitch will travel a greater distance with each revolution. The aircraft will move forward at greater speed for a given rpm.

The propeller set in fine pitch will have less torque (drag) and will revolve at a higher speed around its axis. The engine will produce greater power. A fine pitch propeller will be good for taking off and climbing but a coarse pitch propeller will develop high cruise speed with comparatively low engine rpm giving good fuel economy.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What does the propeller provide?

Q2. What is propeller torque?

Q3. For what is a fine pitch propeller good?

ANTICIPATED ANSWERS:

A1. The propeller provides the necessary thrust to pull, or in some cases push, the airplane through the air.

A2. It is the resistance to the blades as they rotate, resulting in a tendency in the aircraft to roll in a direction opposite to the rotation of the propeller.

A3. A fine pitch propeller will be good for taking off and climbing.

Teaching Point 2 **Describe types of propellers.**

Time: 10 min Method: Interactive Lecture

FIXED PITCH PROPELLERS

Fixed pitch propeller. The blade angle can not be adjusted by the pilot and is used on most training aircraft. The blade angle is set by the manufacturer to provide the best compromise for all flight conditions.

VARIABLE PITCH PROPELLERS

Adjustable pitch propeller. The blade angle can be changed on the ground to adjust for the varying flight situations such as changed takeoff and climb needs.

Controllable pitch propeller. The blade angles can be adjusted by the pilot during flight. The propeller set in a fine pitch for takeoff allows the engine to develop maximum power. The propeller is then adjusted to a coarse pitch to accelerate at a rapid rate to the desired cruise speed.

Constant speed propeller. The blade angles automatically adjust themselves to maintain a constant rpm as set by the pilot.

The mechanism for adjusting the pitch of the propeller includes:

- mechanical,
- hydraulic, and
- electrical.

Mechanical variable pitch propeller. The pilot adjusts this type of propeller by a control on the instrument panel. The control is directly linked to the propeller which has stop sets to govern the blade angle and travel.

Hydraulic variable pitch propellers. A hydraulically operated cylinder pushes or pulls on a cam connected to gears on the propeller blade. The mechanism can be a counterweight or hydromatic.

The counterweight relies on oil pressure to move the cylinder that twists the blades of a controllable pitch propeller toward fine pitch. The control is adjusted by the pilot in the cockpit.

A constant pitch propeller uses the oil pressure and counterweight principle to twist the blades to the proper pitch angle to maintain a constant rpm. The pilot uses the throttle and propeller control located in the cockpit. The throttle controls the power output of the engine and the propeller control regulates the rpm of both the propeller and the engine.

If oil pressure is lost during flight, the propeller will automatically go into an extreme coarse pitch position where the blades are streamlined and cease to turn (feathered). This system is used in multi-engine aircraft.

A powerful force called centrifugal twisting moment turns the blades toward the fine pitch position of a hydromatic constant speed propeller. The natural force eliminates the use of counterweights. Oil enters the piston chamber under high pressure which moves the piston aft and the blades move into coarse pitch. When the oil enters into the piston chamber under engine pressure, the blades move to fine pitch.

If oil pressure is lost during flight, the propeller will automatically go into fine pitch position, enabling the engine to develop the most power it can and achieve the best performance under the circumstances. This system is used in single-engine aircraft.

Electric variable pitch propellers. An electrical motor turns the blades through a gear speed reducer and bevel gears for an electrical variable pitch propeller. Flyweights open and close electric circuits. One circuit causes a right-hand rotation of the motor and another causes a left-hand rotation. The rotation of the motor will adjust the blades toward a fine or coarse pitch as required. The pilot can set a two-way switch to either manual or automatic operation.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. Who sets the blade angle on fixed pitch propeller?

Q2. How can the propeller pitch be adjusted?

Q3. What happens to the propeller if oil pressure is lost on a single-engine aircraft?

ANTICIPATED ANSWERS:

A1. The blade angle is set by the manufacturer.

A2. The mechanism for adjusting the pitch of the propeller includes:

- mechanical,
- hydraulic, and
- electrical.

A3. If oil pressure is lost during flight, the propeller will automatically go into fine pitch position, enabling the engine to develop the most power it can and achieve the best performance under the circumstances.

Teaching Point 3 **Describe feathering and propeller reversing.**

Time: 5 min Method: Interactive Lecture

Feathering is used on multi-engine aircraft. When one engine is off, the propeller is feathered meaning the turning blades are the extreme coarse pitch position and stop turning. This reduces drag on the blades, possible damage to the defective engine and stops excessive vibration.

Propeller reversing is used at slow speed to assist with stopping an aircraft once on the ground. The blade angle of a controllable pitch propeller is changed to a negative value. The reverse pitch uses engine power to produce a high negative thrust at slow speed.

A pilot of a multi-engine aircraft can decrease the radius of a turn by using propeller reversing with the inside engine.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. What is feathering?

Q2. For what is propeller reversing used?

Q3. What pitch angle is used during propeller reversing?

ANTICIPATED ANSWERS:

A1. Feathering is when blades are set to the extreme coarse pitch position and stop turning.

A2. Propeller reversing is used at slow speed to assist with stopping an aircraft once on the ground.

A3. A negative pitch angle is used during propeller reversing.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. What is pitch?

Q2. Name two propeller types.

Q3. What type of aircraft use propeller feathering?

ANTICIPATED ANSWERS:

A1. Pitch is the distance in feet a propeller travels forward in one revolution.

A2. Fixed pitch and variable pitch.

A3. Multi-engine aircraft.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, Aviation Subjects–Combined Assessment PC.

CLOSING STATEMENT

Being able to describe propeller systems is important for understanding more complex material. A solid understanding of propellers is required to pursue future aviation training.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Peppler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.

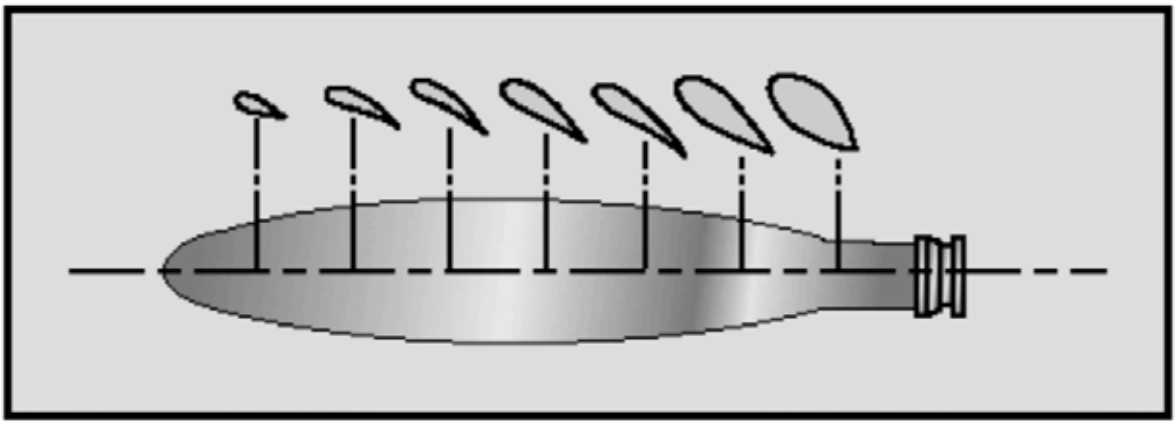


Figure A-1 Propeller Blade Shape

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved November 27, 2008, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html

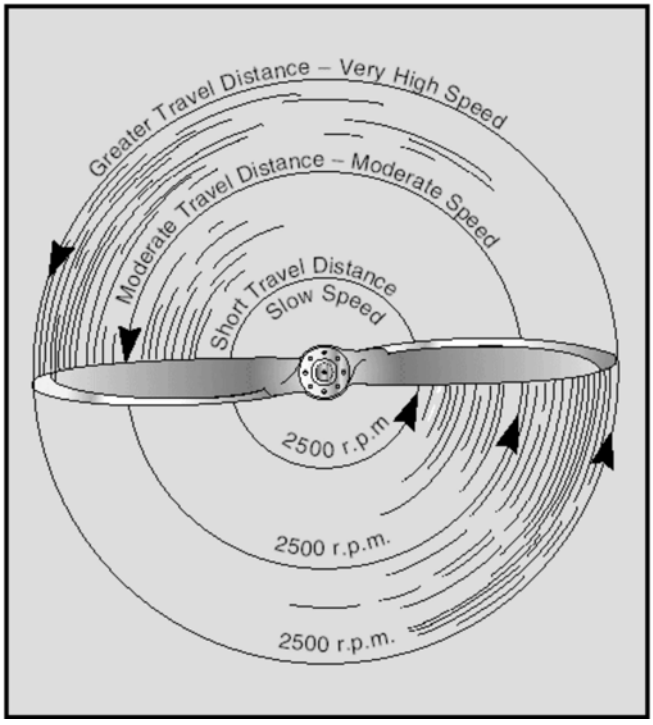


Figure A-2 Relationship of Travel Distance and Speed of Various Portions of Propeller Blade

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved November 27, 2008, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html

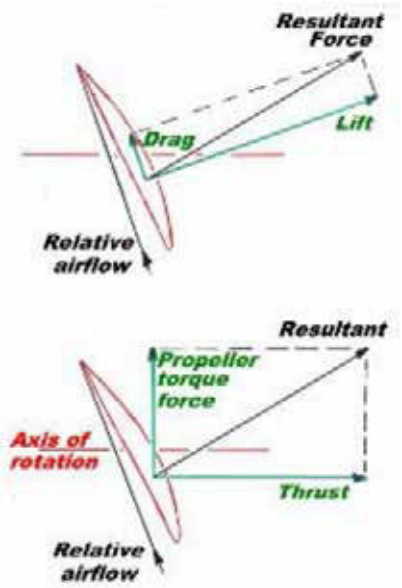


Figure A-3 Forces Acting on a Propeller Blade

Note. From "Recreational Aviation Australia Incorporated", *Engine and Propeller Performance*. Retrieved March 12, 2009, from http://www.auf.asn.au/groundschool/propeller.html

ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 3

EO M432.03 – DESCRIBE ENGINE INSTRUMENTS

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Prepare slides located at Attachment A.

Photocopy the Aero Engines Review Worksheet located at Attachment B for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TPs 1–4 to clarify, emphasize, and summarize engine instruments.

An in-class activity was chosen for TP 5 as it is an interactive way to reinforce the topic and confirm the cadets' comprehension of aero engine systems.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have described engine instruments.

IMPORTANCE

It is important for cadets to be able to describe engine instruments as a solid understanding of engine instruments provides knowledge for potential instructional duties and is part of the fundamentals that cadets pursuing future aviation training will require.

Teaching Point 1 **Describe the oil pressure and oil temperature gauges.**

Time: 5 min Method: Interactive Lecture

Show slide of Figure A-1 to the cadets.

One of the principle engine instruments is the oil pressure gauge. It is usually positioned beside the oil temperature and fuel gauges. The instrument is calibrated in pounds per square inch (psi) and indicates the oil pressure supplied by the oil pump to lubricate the engine.

The gauge should be checked immediately after the engine has been started. As the oil warms, the reading should adjust to operational pressure. This may take up to 15 minutes. If the pressure remains high, the engine is not getting proper lubrication. High oil pressure pushes oil into the combustion chamber where it burns causing a smoky exhaust and badly carbonized piston heads, valve seats, cylinder heads and more.

Low oil pressure causes more serious problems as no film of oil goes between the working surfaces of the engine. Metal against metal rubbing causes main bearings to wear out.

The oil temperature gauge records the temperature of the oil in degrees Fahrenheit or Celsius. As the oil warms during start-up, the pressure should read high and the temperature low. Both instruments should approach their normal readings as the oil warms.

An abnormal drop in oil pressure and rise in oil temperature indicates trouble. Also, no change in oil pressure but a change in oil temperature is a warning of excessive friction or overload in the engine.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. Which two gauges measure the properties of the engine oil?

Q2. When should the oil pressure gauge be first checked?

Q3. What changes in oil pressure and temperature indicates trouble?

ANTICIPATED ANSWERS:

A1. Oil pressure and temperature gauges.

A2. Immediately after the engine has been started.

A3. An abnormal drop in oil pressure and rise in oil temperature.

Teaching Point 2 **Describe the cylinder head temperature gauge.**

Time: 5 min Method: Interactive Lecture

Show slide of Figure A-2 to the cadets.

The cylinder head temperature gauge shows the temperature of one or all engine cylinder heads. This reading shows the pilot the effectiveness of the engine cooling system. Extremely high cylinder head temperatures indicate an immediate sign of engine overload which can result in detonation, pre-ignition, and eventual engine failure.

Detonation. Abnormally rapid combustion due to the inability of fuel to burn slowly. Detonation is dangerous and expensive, causing high stress on engine parts and overheating.

Pre-ignition. The premature ignition of the mixture due to glowing carbon particles. It is sometimes confused with detonation. Pre-ignition is often experienced when attempting to start a hot engine and results in a backfire.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. Which gauge measures the effectiveness of the engine cooling system?

Q2. What do extremely high cylinder head temperatures indicate?

Q3. In what can engine overload result?

ANTICIPATED ANSWERS:

A1. The cylinder head temperature gauge.

A2. An immediate engine overload.

A3. Detonation, pre-ignition and eventual engine failure.

Teaching Point 3 **Describe the tachometer.**

Time: 5 min Method: Interactive Lecture

Show slide of Figure A-3 to the cadets.

The tachometer shows the speed at which the engine crankshaft is turning in hundreds of revolutions per minute (rpm). The tachometer records the engine hours of operation. The more common types of tachometer, are mechanical including centrifugal, or magnetic and electrical, which include direct current, or alternating current.

An aircraft with a fixed pitch propeller will only have a tachometer to read the engine power produced. It records the rpm at which the engine cranks and the propeller turns.

An aircraft with a controllable pitch or a constant speed propeller uses two gauges. The tachometer shows the rpm settings as controlled by the propeller control. The manifold pressure gauge shows the power produced by the engine.

The tachometer is marked with colour-coded arcs to indicate the proper range of engine operation, including:

- green indicating normal range of operation;
- yellow indicating the caution range and possible problems; and
- red indicating the maximum limit.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. What does the tachometer show?

Q2. How is the tachometer marked?

Q3. Which colours are used to indicate the proper range of engine operation?

ANTICIPATED ANSWERS:

A1. The speed at which the engine crankshaft is turning.

A2. With colour-coded arcs.

A3. Green (normal range), yellow (caution range), and red (maximum limit).

Teaching Point 4 **Describe the manifold pressure gauge.**

Time: 5 min Method: Interactive Lecture

Show slide of Figure A-4 to the cadets.

The manifold pressure gauge also has colour-coded arcs displayed on the gauge to indicate the normal operating range and operation limits. The gauge indicates in inches of mercury the fuel / air pressure in the engine intake manifold at the point between the carburetor and the cylinders.

With an aircraft fitted with a constant speed propeller, the rpm setting will remain constant. The manifold pressure gauge is the only instrument to show any fluctuations in the engine power output. A reduction in manifold pressure can indicate carburetor icing.

When the engine is not running, the reading on the manifold pressure gauge will be of the existing atmospheric pressure.

Excessive manifold pressure raises the compression pressure causing high stress on the pistons and cylinder assemblies. It also produces excessive temperature which may cause scoring on the pistons, sticking rings, and burned out valves.

When increasing power, increase the rpm first and then the manifold pressure.

When decreasing power, decrease the manifold pressure first and then the rpm.

CONFIRMATION OF TEACHING POINT 4

QUESTIONS:

Q1. What does the manifold pressure gauge indicate?

Q2. What can a reduction in manifold pressure indicate?

Q3. What will the reading on the manifold pressure gauge be when the engine is not running?

ANTICIPATED ANSWERS:

A1. The gauge indicates in inches of mercury the fuel / air pressure in the engine intake manifold at the point between the carburetor and the cylinders.

A2. Carburetor icing.

A3. The existing atmospheric pressure.

Teaching Point 5 **Conduct an in-class activity to review aero engines.**

Time: 5 min Method: In-Class Activity

OBJECTIVE

The objective of this activity is to have the cadets review aero engine systems.

RESOURCES

- Pen / pencil,
- Aero Engines Review Worksheet located at Attachment B, and
- Aero Engines Review Worksheet Answer Key located at Attachment C.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Distribute a worksheet to each cadet.
2. Have the cadets complete the worksheet.
3. When the cadets have completed their worksheet, have them review their answers using the answer key located at Attachment C.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 5

The cadets' participation in the activity will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' completion of the Aero Engines Review Worksheet will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Additional time may be required for the cadets to complete the worksheet.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 3, Annex B, Aviation Subjects–Combined Assessment PC.

CLOSING STATEMENT

Being able to describe engine instruments is important for understanding more complex material. A solid understanding of engine instruments is required to pursue future aviation training.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Peppler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.

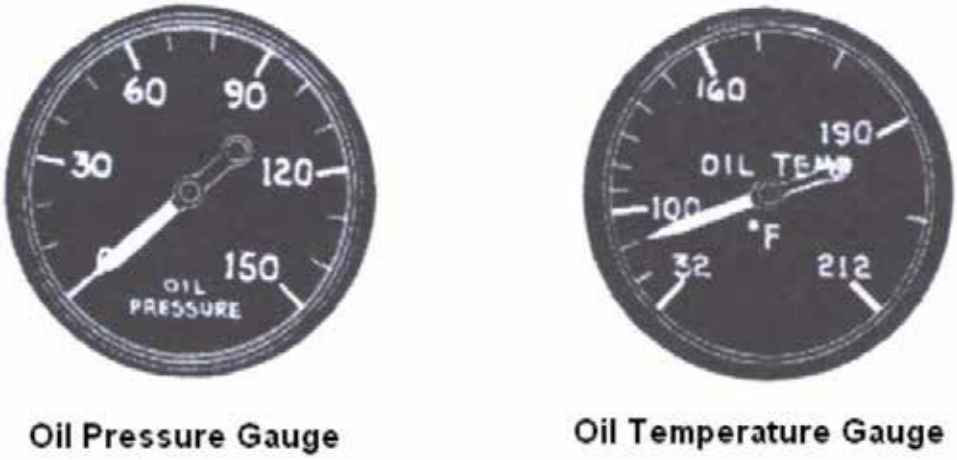


Figure A-1 Oil Pressure and Temperature Gauges

Note. From *From the Ground Up* (p. 133), by A. F. MacDonald and I. L. Pepper, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

Figure A-2 Cylinder Head Temperature Gauge

Note. From *From the Ground Up* (p. 133), by A. F. MacDonald and I. L. Pepper, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

Figure A-3 Tachometer

Note. From *From the Ground Up* (p. 133), by A. F. MacDonald and I. L. Pepper, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

Figure A-4 Manifold Pressure Gauge

Note. From *From the Ground Up* (p. 133), by A. F. MacDonald and I. L. Pepper, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

Aero Engines Review Worksheet

1. Where should the fuel tank be positioned in a gravity feed system?

   _____.

2. What system do low-wing configured aircraft and large aircraft with a large volume of fuel use?

   _____.

3. What does the fuel selector valve, used by the pilot, do?

   _____.

4. A rich mixture is used for:

   _____.

5. How are the fuel / air proportions calculated?

   _____.

6. Which propeller would not be good for taking off and climbing?

   _____.

7. What is maintained throughout most of the diameter of the propeller by means of the variation in airfoil sections and the angle of attack?

   _____.

8. What is the distance a propeller travels forward in one revolution?

   _____.

9. What colour-coded arcs are found on the tachometer?

   _____.

10. What reading will register on the manifold pressure gauge when the engine is not running?

    _____.

11. What occurs to an engine as the altitude increases and the air becomes less?

    _____.

12. A feathered propeller is in:

    _____.

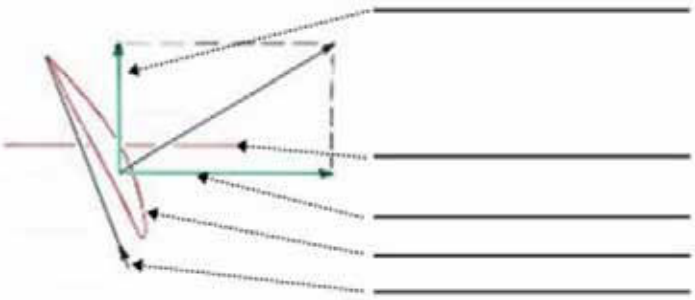
13. In what units is the oil pressure gauge calibrated?

    _____.

14. What does the tachometer show?

    _____.

15. Label the following parts on the diagram below.
    a. Thrust
    b. Relative airflow
    c. Propeller
    d. Axis of rotation
    e. Propeller torque force



Aero Engines Review Worksheet Answer Key

1. Where should the fuel tank be positioned in a gravity feed system?
   Above the carburetor.

2. What system do low-wing configured aircraft and large aircraft with a large volume of fuel use?
   Pressure-feed system.

3. What does the fuel selector valve, used by the pilot, do?
   Select desired fuel tank to draw fuel and shut off the flow of fuel from the tanks.

4. A rich mixture is used for:
   high power settings.

5. How are the fuel / air proportions calculated?
   By volume.

6. Which propeller would not be good for taking off and climbing?
   Coarse pitch.

7. What is maintained throughout most of the diameter of the propeller by means of the variation in airfoil sections and the angle of attack?
   Thrust.

8. What is the distance a propeller travels forward in one revolution?
   Pitch.

9. What colour-coded arcs are found on the tachometer?
   Green, yellow, red.

10. What reading will register on the manifold pressure gauge when the engine is not running?
    Atmospheric pressure.

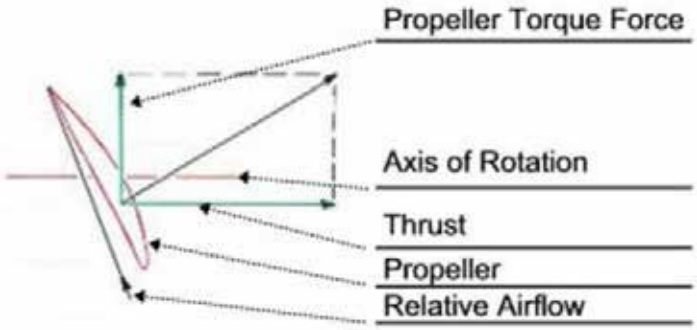
11. What occurs to an engine as the altitude increases and the air becomes less dense?
    Power decreases.

12. A feathered propeller is in:
    extreme coarse pitch position and stops turning.

13. In what units is the oil pressure gauge calibrated?
    Pounds per square inch.

14. What does the tachometer show?
    The speed at which the engine crankshaft is turning.

15. Label the following parts on the diagram below.
    a. Thrust
    b. Relative airflow
    c. Propeller
    d. Axis of rotation
    e. Propeller torque force



ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 4

EO C432.01 – DESCRIBE IGNITION AND ELECTRICAL SYSTEMS

Total Time:	30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Prepare slides located at Attachment A.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to clarify, emphasize, and summarize the ignition and electrical systems.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have described ignition and electrical systems.

IMPORTANCE

It is important for cadets to be able to describe ignition and electrical systems as a solid understanding of ignition and electrical systems provides knowledge for potential instructional duties and is part of the fundamentals that cadets pursuing future aviation training will require.

Teaching Point 1 **Describe the ignition system.**

Time: 15 min Method: Interactive Lecture

Show slide of Figure A-1 to the cadets.

The ignition system provides an electrical spark to ignite the fuel / air mixture in each cylinder. The system usually consists of:

- two magnetos,
- two spark plugs per cylinder,
- ignition leads, and
- a magneto switch (on the instrument panel).

The magneto is an engine-driven generator which produces an electrical current without using an external current. It combines all elements of the ignition system, including:

- generating a low tension current;
- transforming the low tension current to high tension; and
- distributing the current to the individual spark plugs and causing them to fire.

When the magneto switch is off, the system is grounded and the electrical charge does not flow through the magneto and a spark is not produced. When the switch is on, the system is not grounded and the electrical charge flows through the magneto and a spark can be produced.

Dual ignition systems include two spark plugs in each cylinder, and two magnetos.

One spark plug in each cylinder is fired by one magneto. The other magneto fires the second spark plug in each cylinder. This dual ignition system provides improved:

- **Safety.** If one system fails, the engine will still operate.
- **Performance.** Improved combustion of the fuel / air mixture increases the power output and gives better engine performance.

The magneto switch allows the pilot to select either one or both magneto systems. The engine should always be operated on both magneto systems during takeoff and normal flight.

The magneto switch shall be turned to off when the aircraft is parked. If the propeller is moved, the engine can fire if the ignition switch is on.

Correctly set ignition timing allows the magneto to fire at the right time. If the spark plug fires too early, poor engine performance may occur, including:

- loss of power, and
- overheating which can lead to:
    - detonation,
    - pre-ignition,
    - piston burning,
    - scored cylinders, and
    - broken rings.

The wires in the ignition system are shielded (a metal covering which is grounded). Shielding prevents the ignition current from interfering with the radio, whole ignition system, magnetos, plugs, and wiring.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What are the parts of the ignition system?

Q2. What does correct set ignition timing allow?

Q3. What does shielding prevent?

ANTICIPATED ANSWERS:

A1. The ignition system has:

- two magnetos,
- two spark plugs per cylinder,
- ignition leads, and
- a magneto switch (on the instrument panel).

A2. Allows the magneto to fire at the right time.

A3. The ignition current from interfering with the radio, whole ignition system, magnetos, plugs, and wiring.

Teaching Point 2 **Describe the electrical system.**

Time: 10 min Method: Interactive Lecture

Show slide of Figure A-2 to the cadets.

The electrical system includes everything that operates electrically except the magnetos. There is no connection from the aircraft's electrical system to the ignition system.

The basic electrical system includes:

- a storage battery,
- master switch and battery solenoid,
- starter motor and solenoid,
- generator (or alternator),
- voltage regulator,
- bus bar, and
- circuit breakers.

The electrical system is either a 12- or 24-volt system and is direct current. The battery solenoid activated by the master switch completes the circuit between the electrical energy from the storage battery and the electrical system. The most important action by a pilot is to have the battery fully charged for the electrical components to function satisfactorily.

The starter switch activates the starter solenoid which allows current to enter and drive the starter motor.

The engine drives the generator or alternator for the purpose of providing current to the electrical system, and recharging the battery.

An alternator produces sufficient current to operate the various electrical components at low engine speeds.

A generator will not begin to supply current until the engine is turning at a faster speed.

The voltage regulator is used to prevent the generator or alternator from overloading the system, and the battery from becoming overcharged.

The current produced by the generator or alternator and battery is received by the bus bar which passes the current through the various circuit breakers and branches out to the various electrical circuits.

Circuit breakers or other fuses protect all electrical circuits from damage from excess voltage or current, and short-circuits. Most circuit breakers have a push button to reset. If the circuit breaker continues to fail, there may be malfunction in the component that could cause an electrical fire.

The pilot monitors the electrical system in the cockpit using:

- an ammeter,
- a voltmeter, and / or
- a warning light.

The ammeter measures in amperes the rate of flow of the electrical current being produced and when power is being used by the battery.

The voltmeter indicates the voltage in the electrical system.

The generator warning light shows when the generator is not working.

If the ammeter is showing on the plus (+) side of 0 on the gauge, there is satisfactory electrical operation.

If the ammeter is showing discharge or minus (-), energy is drawing from the battery rather than from the generator / alternator.

All contacts between the battery, voltage regulator, and the alternator or generator need to be clean and secure. Battery water level should be checked regularly and an aged battery that is no longer working properly should immediately be replaced.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What is the most important action by a pilot regarding the electrical system?

Q2. What instruments does the pilot monitor?

Q3. What do all the contacts between the battery, voltage regulator, and the alternator or generator need to be?

ANTICIPATED ANSWERS:

A1. Ensure the battery is fully charged.

A2. An ammeter, a voltmeter, and / or a warning light.

A3. To be clean and secure.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. What is the difference between an alternator and a generator?

Q2. What shall the magneto switch be turned to when the aircraft is parked?

Q3. What is included in the basic electrical system?

ANTICIPATED ANSWERS:

A1. An alternator produces sufficient current to operate the various electrical components at low engine speeds while a generator will not begin to supply current until the engine is turning at a faster speed.

A2. The magneto switch shall be turned to off when the aircraft is parked.

A3. The basic system includes:

- a storage battery,
- master switch and battery solenoid,
- starter motor and solenoid,
- generator (or alternator),
- voltage regulator,

- bus bar, and
- circuit breakers.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Being able to describe ignition and electrical systems is important for understanding more complex material. A solid understanding of ignition and electrical systems is required to pursue future aviation training.

INSTRUCTOR NOTES / REMARKS

Cadets who are qualified Advanced Aviation may assist with this instruction.

REFERENCES

C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Peppler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.

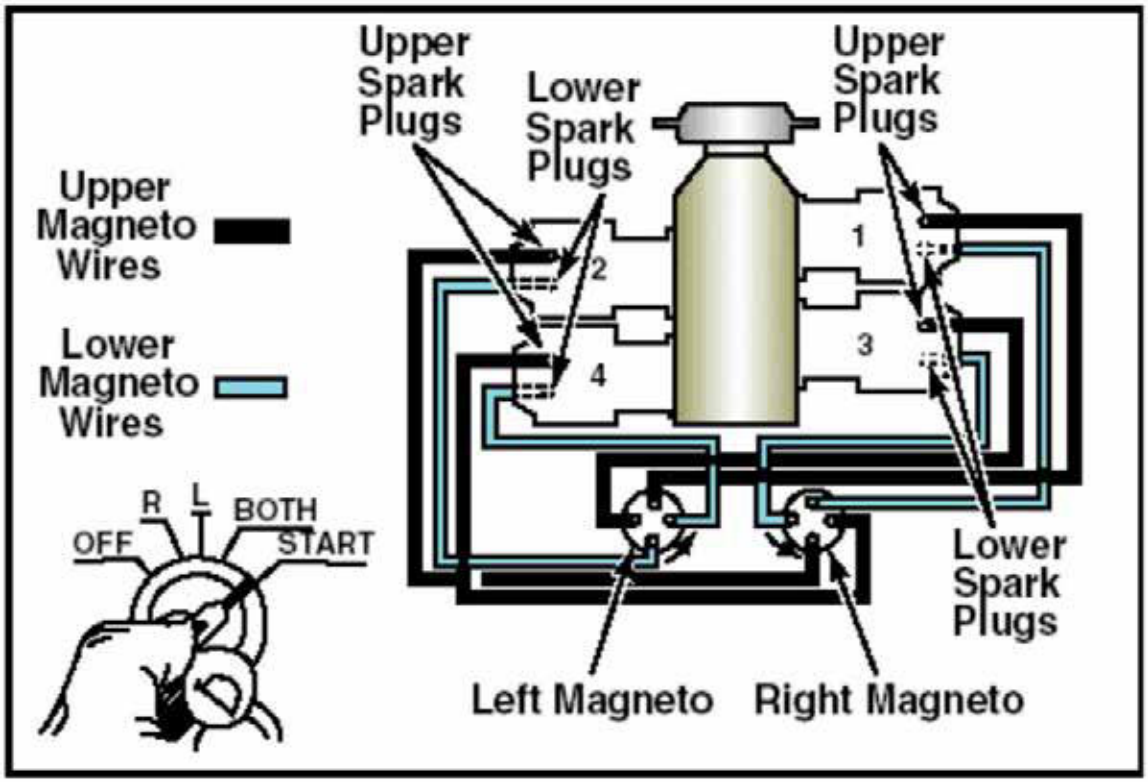


Figure A-1 Ignition System

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved March 13, 2009, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html

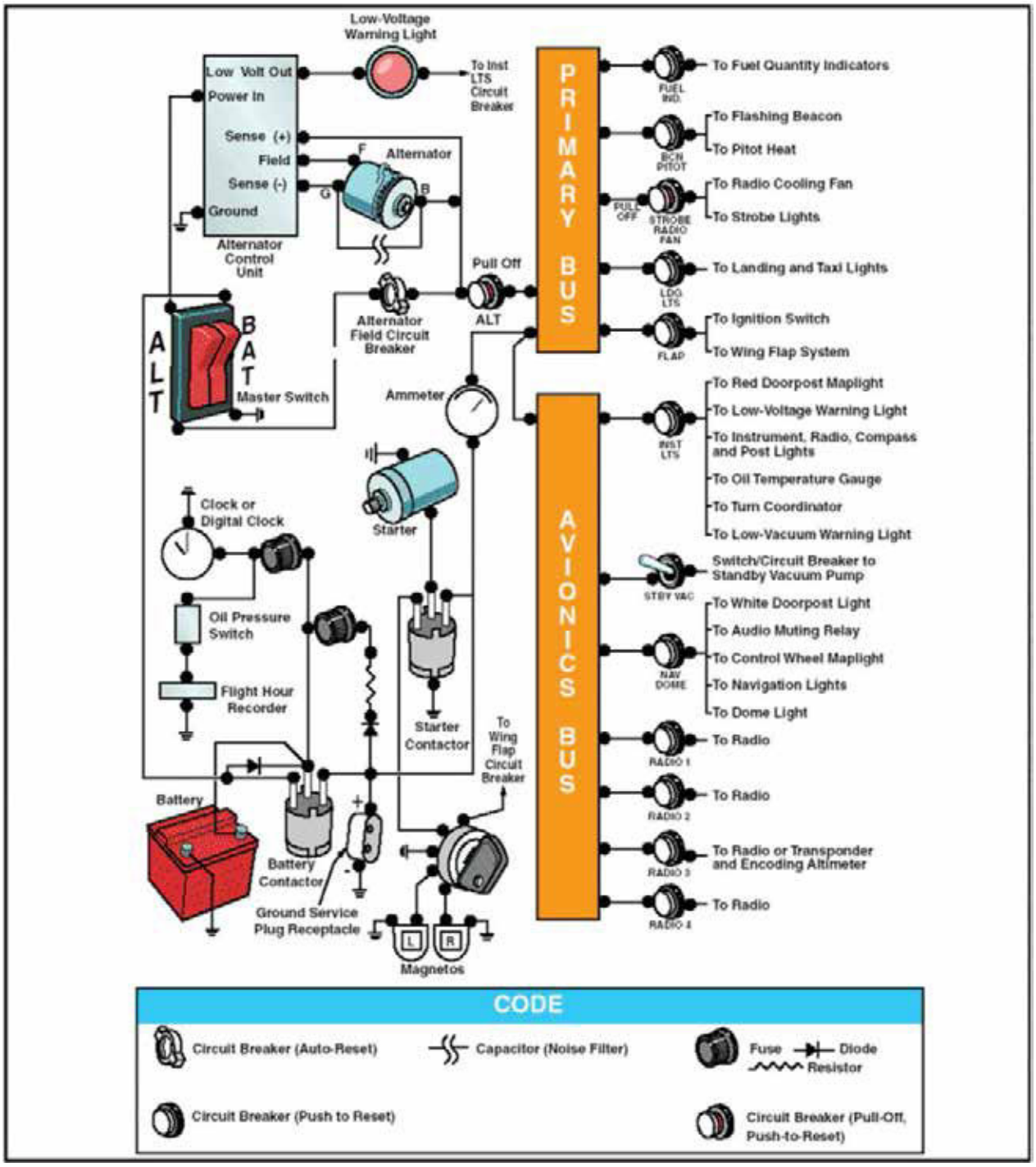


Figure A-2 Electrical System

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved March 13, 2009, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html

ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 5

EO C432.02 – DESCRIBE TURBOCHARGING AND SUPERCHARGING SYSTEMS

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Prepare slides located at Attachment A.

Photocopy the Turbocharging and Supercharging Worksheet located at Attachment B for each cadet.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TPs 1 and 2 to clarify, emphasize, and summarize turbocharging and supercharging systems.

An in-class activity was chosen for TP 3 to confirm the cadets' comprehension of turbocharging and supercharging.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have described turbocharging and supercharging systems.

IMPORTANCE

It is important for cadets to be able to describe turbocharging and supercharging systems as a solid understanding of turbocharging and supercharging systems provides knowledge for potential instructional duties and is part of the fundamentals that cadets pursuing future aviation training will require.

Teaching Point 1 **Describe turbocharging.**

Time: 10 min Method: Interactive Lecture

Show slide of Figure A-1 to the cadets.

The capability of the engine to produce power decreases as altitude increases and the air becomes less dense. A turbocharger supplies dense air when the aircraft is operating in thin air at a high altitude using the engine power without using engine horsepower.

Show slide of Figure A-2 to the cadets.

Hot exhaust gases are discharged as waste energy and directed through a turbine wheel (impeller) at high rpm. The turbine wheel is mounted on a shaft paired with a centrifugal air compressor enclosed in separate housings. The compressor turns at the same speed as the turbine wheel. The air supplied by the compressor will be denser which enables the engine to produce more power.

The turbocharger is located between the air intake and the carburetor so the air is compressed before mixing with the fuel from the carburetor. The speed of the turbine depends on the difference in pressure between the exhaust gas and the outside pressure. The greater the difference, the less back pressure on the escaping gases and more speed by the turbine.

When flying at lower, denser altitudes, a waste gate in the exhaust system can remain open and the exhaust gas vents around the turbine into the atmosphere. Control of the turbocharger is provided by manual control, and automatic control.

Manual control. The simplest control system. It involves bleeding exhaust gas continuously through an opening of predetermined size allowing the remainder of the exhaust gas to turn the turbocharger. Engine power is adjusted by the throttle.

The more common manual control connects the throttle and the waste gate with the cockpit throttle control. A programmed movement of the throttle plate in the carburetor and the waste gate pair the opening and closing of the two systems. As the throttle plate moves toward full open, the waste gate closes.

Automatic control. A pressure controller senses the difference in air pressure and controls the position of the waste gate using pressurized oil.

The turbocharging system increases performance at altitude. It delivers full power at altitudes above the service ceiling of a normal engine.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What does a turbocharger supply?

Q2. On what does the speed of the turbine depend?

Q3. What does the pressure controller in an automatic control do when it senses a difference in air pressure?

ANTICIPATED ANSWERS:

A1. Dense air when the aircraft is operating in thin air at a high altitude.

A2. The difference in pressure between the exhaust gas and the outside pressure.

A3. It controls the position of the waste gate using pressurized oil.

Teaching Point 2 **Describe supercharging systems.**

Time: 5 min Method: Interactive Lecture

Show slide of Figure A-3 to the cadets.

Supercharging works on the same general principles as turbocharging (eg, density). The supercharger is an internally driven compressor powered by the engine. A supercharger compresses the fuel / air mixture after it leaves the carburetor (forced induction). When forced induction is used to increase the power of an engine at low altitudes, it is called boost.

When forced induction is used at high altitude to adjust for the lower density of the air and maintain sea level power, it is called supercharging.

Turbocharging. Compressing the intake air using a turbine turned by the exhaust gases.

Supercharging. Compressing the intake air using a turbine turned by the engine / crankshaft power.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What powers the supercharger?

Q2. What is the name given when the supercharger compresses the fuel / air mixture after it leaves the carburetor?

Q3. What is supercharging?

ANTICIPATED ANSWERS:

A1. The engine powers the supercharger.

A2. Forced induction.

A3. Supercharging is the use of forced induction at high altitude to adjust for the lower density of the air and maintain sea level power.

Teaching Point 3 **Conduct an in-class activity to confirm the cadets' comprehension of turbocharging and supercharging.**

Time: 10 min Method: In-Class Activity

OBJECTIVE

The objective of this activity is to have the cadets confirm their comprehension of turbocharging and supercharging.

RESOURCES

- Pen / pencil,
- Turbocharging and Supercharging Worksheet located at Attachment B, and
- Turbocharging and Supercharging Worksheet Answer Key located at Attachment C.

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

1. Distribute a worksheet to each cadet.
2. Have the cadets complete the worksheet.
3. Review the answers using the answer key.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 3

The cadets' participation in the activity will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets' completion of the Turbocharging and Supercharging Worksheet will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Being able to describe turbocharging and supercharging systems is important for understanding more complex material. A solid understanding of turbocharging and supercharging systems is required to pursue future aviation training.

INSTRUCTOR NOTES / REMARKS

Cadets who are qualified Advanced Aviation may assist with this instruction.

REFERENCES

C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Peppler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.

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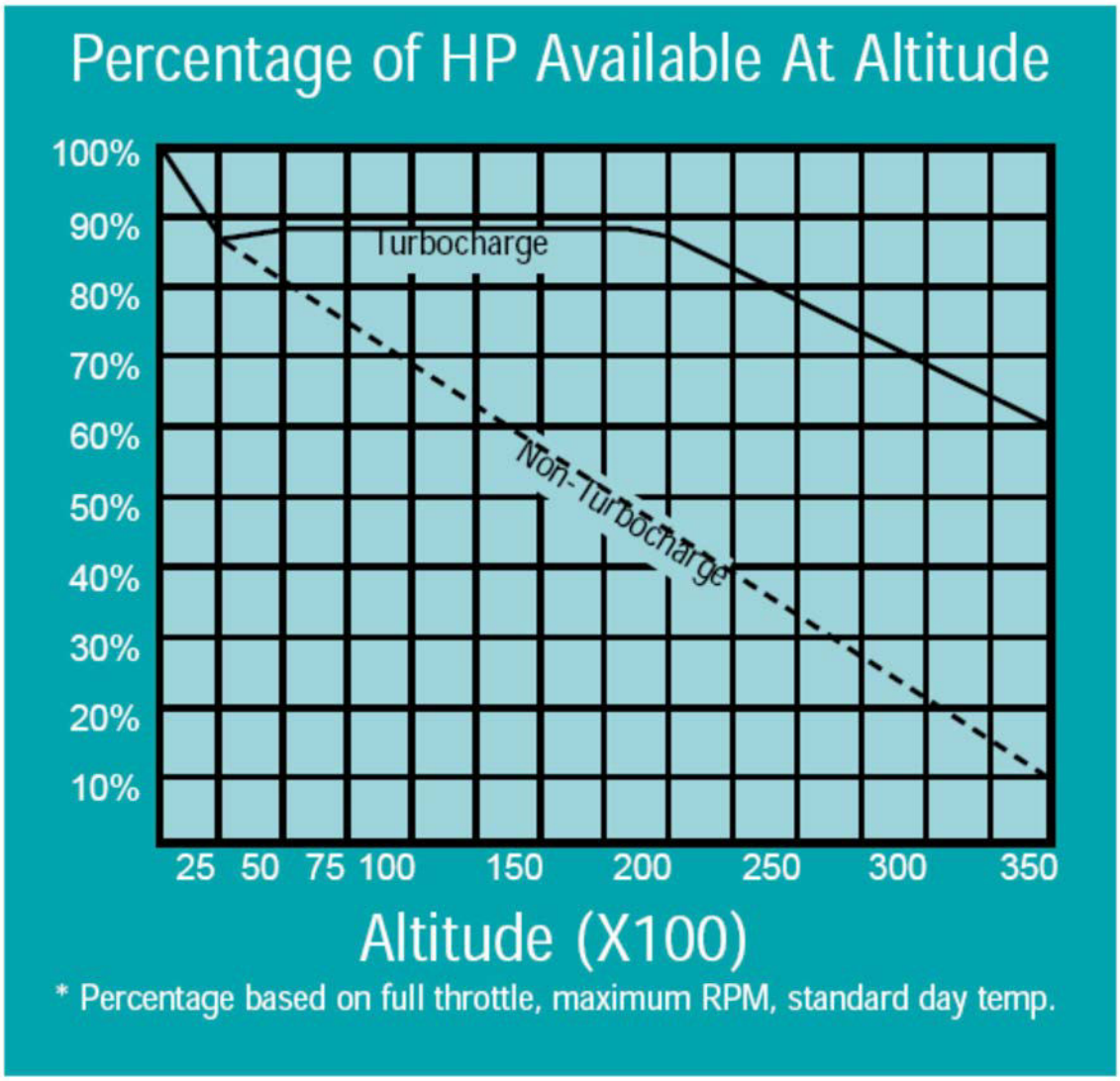


Figure A-1 Percentage of Horsepower Available at Altitude

Note. From "Boosting Your Knowledge of Tubocharging", *Kelly Aerospace*. Retrieved March 17, 2009, from http://www.kellyaerospace.com/articles/Turbocharging.pdf

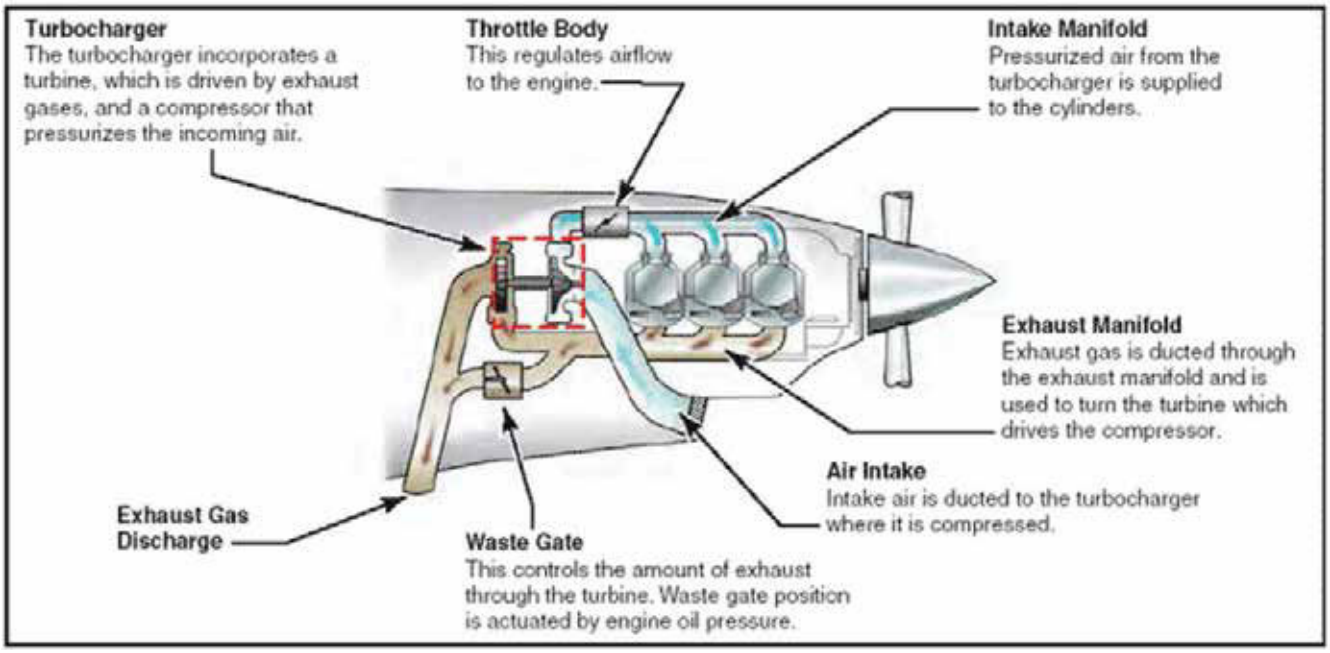
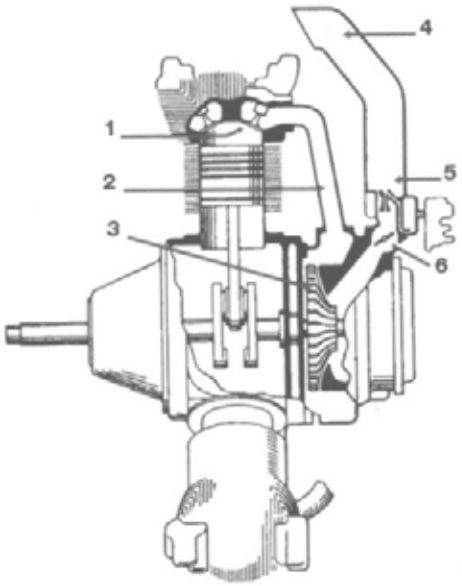


Figure A-2 Turbocharger Components

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved March 17, 2009, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html



1. intake valve
2. intake manifold
3. supercharger
4. airscoop
5. carburetor
6. throttle

Figure A-3 Supercharger Components

Note. From *From the Ground Up: Millennium Edition* (p. 56), by A. F. MacDonald and I. L. Pepper, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

Turbocharging and Supercharging Worksheet

1. Place the following labels in the correct location:

   a. exhaust manifold,

   b. air intake,

   c. waste gate,

   d. exhaust gas discharge,

   e. turbocharger,

   f. throttle body, and

   g. intake manifold.

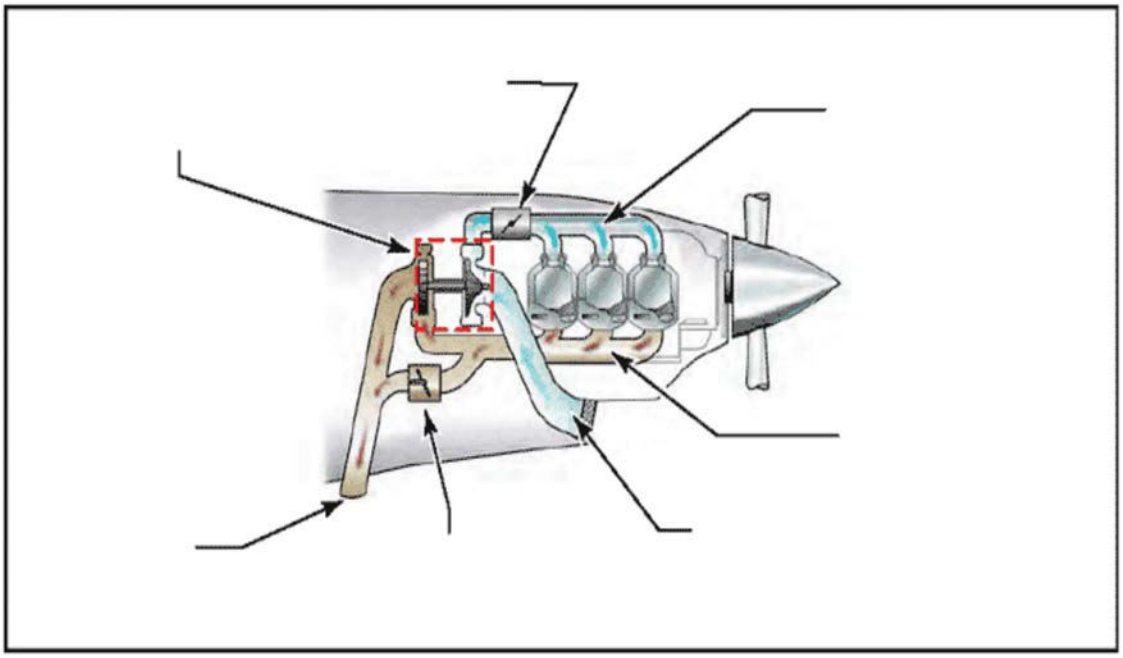


Figure B-1 Turbocharger Components

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved March 17, 2009, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html

2. Explain the key differences between turbocharging and supercharging.

3. Place the following labels in the correct location:

   a. supercharger,

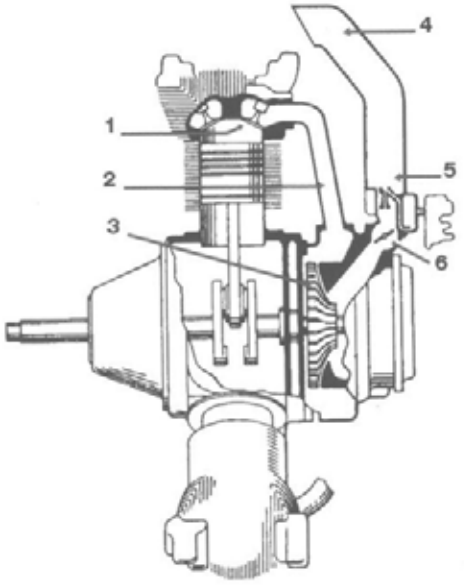
   b. intake manifold,

   c. airscoop,

   d. intake valve,

   e. carburetor, and

   f. throttle.



1. _____

2. _____

3. _____

4. _____

5. _____

6. _____

Figure B-2 Supercharger Components

Note. From *From the Ground Up: Millennium Edition* (p. 56), by A. F. MacDonald and I. L. Pepper, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

Turbocharging and Supercharging Worksheet Answer Key

1. Place the following labels in the correct location:

   a. exhaust manifold,

   b. air intake,

   c. waste gate,

   d. exhaust gas discharge,

   e. turbocharger,

   f. throttle body, and

   g. intake manifold.

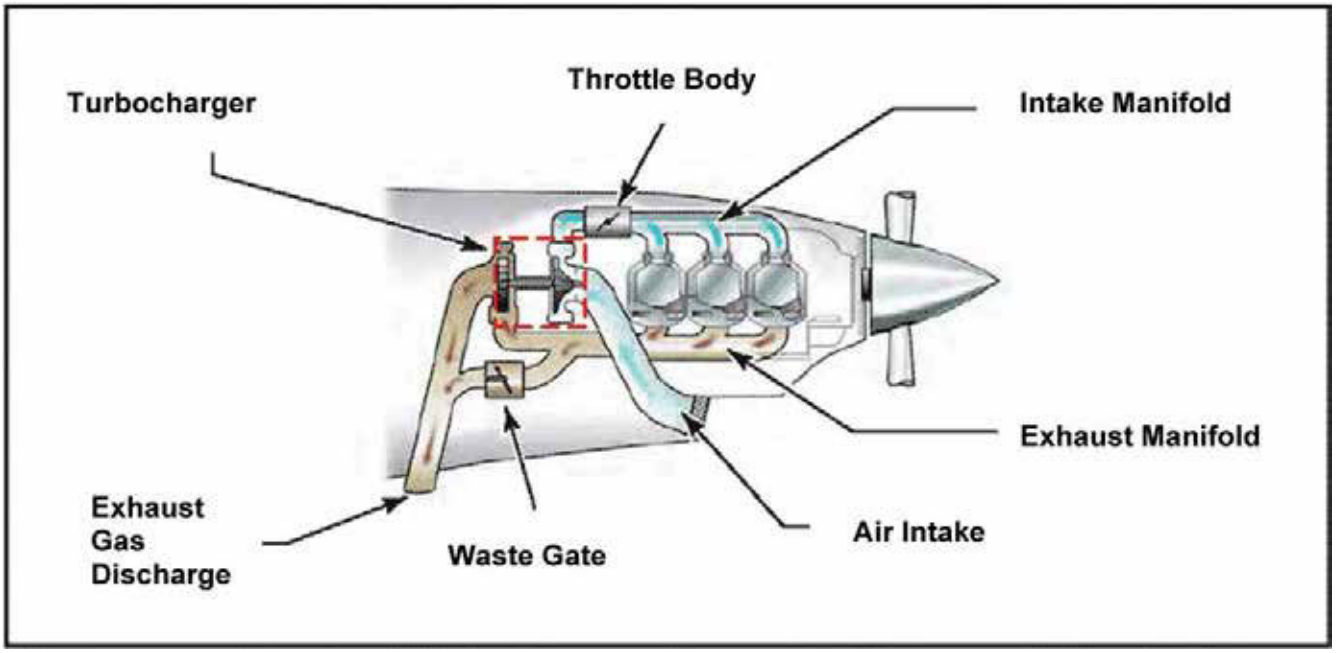


Figure C-1 Turbocharger Components

Note. From "Online Free Private Pilot Ground School", *The Aircraft Powerplant*. Retrieved March 17, 2009, from http://www.free-online-private-pilot-ground-school.com/aircraft-powerplant.html

2. Explain the key differences between turbocharging and supercharging.

A turbocharger compresses the intake air using a turbine turned by the exhaust gases.

A supercharger compresses the intake air using a turbine turned by the engine / crankshaft power.

3. Place the following labels in the correct location:

   a. supercharger,

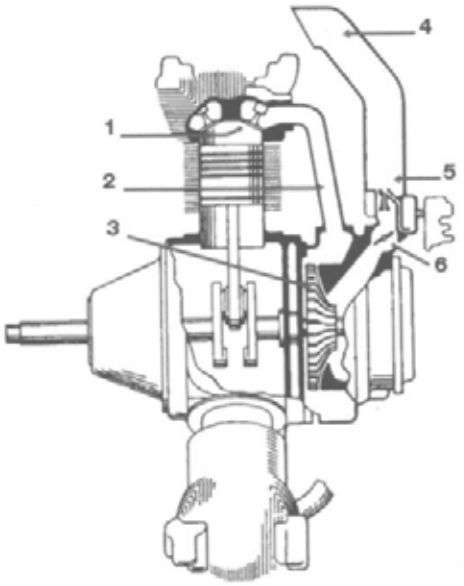
   b. intake manifold,

   c. airscoop,

   d. intake valve,

   e. carburetor, and

   f. throttle.



1. **intake valve**

2. **intake manifold**

3. **supercharger**

4. **airscoop**

5. **carburetor**

6. **throttle**

Figure C-2 Supercharger Components

Note. From *From the Ground Up: Millennium Edition* (p. 56), by A. F. MacDonald and I. L. Pepper, 2000, Ottawa, ON: Aviation Publishers Co. Limited. Copyright 2000 by Aviation Publishers Co. Limited.

ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL FOUR

INSTRUCTIONAL GUIDE

SECTION 6

EO C432.03 – DESCRIBE GAS TURBINE ENGINES

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-804/PG-001, *Proficiency Level Four Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

Review the lesson content and become familiar with the material prior to delivering the lesson.

Prepare slides located at Attachment A.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to clarify, emphasize, and summarize gas turbine engines.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have described gas turbine engines.

IMPORTANCE

It is important for cadets to be able to describe gas turbine engines as a solid understanding of gas turbine engines provides knowledge for potential instructional duties and is part of the fundamentals that cadets pursuing future aviation training will require.

Teaching Point 1 **Describe turbojets.**

Time: 10 min Method: Interactive Lecture

TURBOJETS

Newton's third law states that for every action there is an equal and opposite reaction. All propulsion systems rely on this fact in some way. A turbojet engine is a reactive engine, which creates thrust by ejecting hot gases to create a force, as described by Newton's third law of motion.

The amount of thrust developed by ejecting hot gases depends on the mass and velocity of the material ejected. A turbojet generates thrust by imparting a relatively large acceleration to a relatively small mass of air.

Show the slide of Figure A-1 to the cadets.

Air is brought into the engine through the intake opening at the front and compressed by a series of compressor blades. Once compressed, fuel is added and the mixture is ignited. The hot gases created by the very rapidly burning fuel / air mixture are highly pressurized. These high pressure gases exit at a high velocity out of the back of the engine. Between the combustion chamber and the exhaust nozzle, the high pressure gases are used to turn a turbine that is connected to the compressor blades.

In a reciprocating engine (eg, radial, in-line, horizontally opposed), a new combustion process occurs during each stroke / cycle.

In a turbojet engine, the combustion process is continuous from the time the engine is started until the engine is shut down.

To start the engine, pressurized air is injected into the engine from either an on-board or ground-based source. Another way is to use an alternate power source to spin the compressor blades, drawing air into the engine. Once a sufficient volume of air is flowing into the combustion chamber, fuel and an ignition source can be added. Once combustion has started and the hot exhaust gases are spinning the turbine connected to the compressor blades, the engine is capable of drawing air into itself on its own, and the on-board or ground-based air / power source can be disconnected.

As an aircraft with a turbojet engine flies faster, more air is pushed into the engine as a result of the forward motion. This improves the fuel efficiency of the engine. A turbojet engine becomes more fuel efficient as the airspeed increases.

Conversely, turbojets become fuel inefficient at low airspeeds.

Turbojets can usually be identified visually by their external shape. Turbojets typically have a constant diameter from the front of the engine (air intake) to the rear of the engine (exhaust nozzle).

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. Which law of motion does a turbojet engine demonstrate?

Q2. What is different about the combustion in a turbojet engine, when compared to a reciprocating engine?

Q3. What happens to the fuel efficiency of a turbojet engine as the airspeed increases?

ANTICIPATED ANSWERS:

A1. A turbojet engine demonstrates Newton's third law of motion.

A2. In a turbojet engine, the combustion process is continuous from the time the engine is started until the engine is shut down.

A3. A turbojet engine becomes more fuel efficient as the airspeed increases.

Teaching Point 2 **Describe turbofans.**

Time: 10 min Method: Interactive Lecture

TURBOFANS

Show the slide of Figure A-2 to the cadets.

The turbofan is a turbojet with a fan attached in front of the compressor blades. The fan diameter is larger than the engine core and some of the air moved by the fan bypasses the engine core. This air is moved backwards by the fan in the same way that a propeller works and creates additional thrust for the engine.

In a low-bypass turbofan, the amount of air that bypasses the engine and the amount of air that enters the engine core are approximately equal. In a high-bypass turbo fan, approximately four times as much air may bypass the engine core, which may result in up to 80 percent of the total thrust coming from the bypass portion of the engine.

Show the slide of Figure A-3 to the cadets.

Turbofans are more fuel efficient than turbojets, especially at lower airspeeds. They also produce less noise than turbojets. A turbofan produces more thrust than a turbojet of a similar physical size.

Turbofans can usually be identified visually by their external shape. Turbofans typically have an air intake that is two to four times the diameter of the exhaust nozzle.

Additional advantages of a turbofan engine include:

- very high power to weight ratio, compared to reciprocating and turbojet engines; and
- less vibration than a reciprocating engine.

Disadvantages of a turbofan engine include:

- high cost, and
- delayed response to changes in power settings.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What is a turbofan engine?

Q2. How much air may bypass the engine core in a high-bypass turbofan engine?

Q3. What are two advantages of a turbofan engine?

ANTICIPATED ANSWERS:

A1. A turbofan is a turbojet with a fan attached in front of the compressor blades.

A2. In a high-bypass turbofan approximately four times as much air that enters the engine core may bypass the engine core.

A3. Two advantages of a turbofan engine include:

- very high power to weight ratio, compared to reciprocating and turbojet engines; and
- less vibration than a reciprocating engine.

Teaching Point 3 **Describe turboprops and turboshafts.**

Time: 5 min Method: Interactive Lecture

Instead of using the power of the exhaust gases to produce thrust directly, the gases can be used to turn a turbine connected to a propeller or a shaft.

TURBOPROPS

Show the slide of Figure A-4 to the cadets.

When the power of the exhaust gases are used to turn a propeller, the engine is called a turboprop. In a fixed shaft turboprop, the same turbine turns both the compressor blades and the shaft connected to the propeller. In a free turbine turboprop, a separate turbine is used to turn the shaft connected to the propeller.

The PT6 turboprop engine, manufactured by Pratt and Whitney Aircraft of Canada, is one of the most popular turboprop engines in the world. It comes in a variety of power outputs and is used in a wide range of aircraft.

In all turboprop engines, the shaft from the turbine is connected to a gearbox to reduce the speed of the shaft to a range that is suitable for spinning the propeller.

TURBOSHAFTS

If the shaft of the gas turbine engine is connected to something other than a propeller, the engine is called a turboshaft. The shaft will be connected to a transmission system, and may be used to drive helicopter rotors, electrical generators, compressors, pumps, marine propulsion systems (eg, ships), and / or land propulsion systems (eg, tanks).

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. What is the difference between a turboprop and a turboshaft engine?

Q2. What is the shaft connected to in a turboprop engine to reduce the speed of the shaft?

Q3. For what can a turboshaft engine be used?

ANTICIPATED ANSWERS:

A1. In a turboprop engine, the shaft is connected to a propeller; in a turboshaft engine, it is connected to something other than a propeller.

A2. In a turboprop engine, the shaft from the turbine is connected to a gearbox to reduce the speed of the shaft to a range that is suitable for spinning the propeller.

A3. A turboshaft engine may be used for:

- helicopter rotors,
- electrical generators,
- compressors,
- pumps,
- marine propulsion systems (eg, ships), and / or
- land propulsion systems (eg, tanks).

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. How does a turbojet generate thrust?

Q2. How can a turbofan be visually identified?

Q3. How is a free turbine turboprop different from a fixed shaft turboprop?

ANTICIPATED ANSWERS:

A1. A turbojet generates thrust by imparting a relatively large acceleration to a relatively small mass of air.

A2. Turbofans typically have an air intake that is two to four times the diameter of the exhaust nozzle.

A3. In a free turbine turboprop, a separate turbine is used to turn the shaft connected to the propeller. In a fixed shaft turboprop, the same turbine turns both the compressor blades and the shaft connected to the propeller.

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Being able to describe gas turbine engines is important for understanding more complex material. A solid understanding of gas turbine engines is required to pursue future aviation training and provides knowledge for potential instructional duties.

INSTRUCTOR NOTES / REMARKS

Nil.

REFERENCES

C3-116 ISBN 0-9680390-5-7 MacDonald, A. F., & Peppler, I. L. (2000). *From the ground up: Millennium edition*. Ottawa, ON: Aviation Publishers Co. Limited.

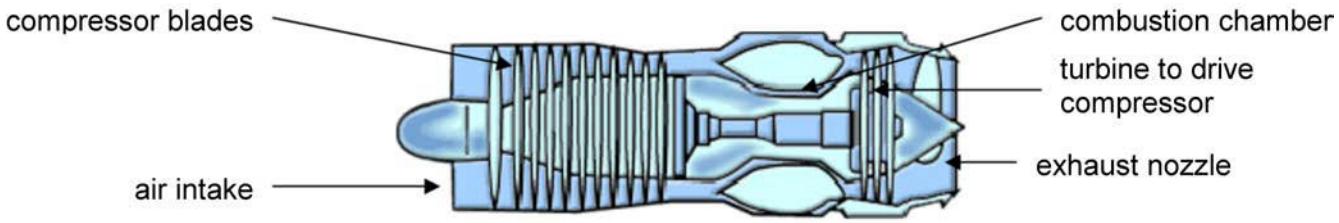


Figure A-1 Turbojet Engine

Note. From "Engines", *NASA Ultra Efficient Engine Technology*. Retrieved March 19, 2009, from http://www.ueet.nasa.gov/StudentSite/engines.html

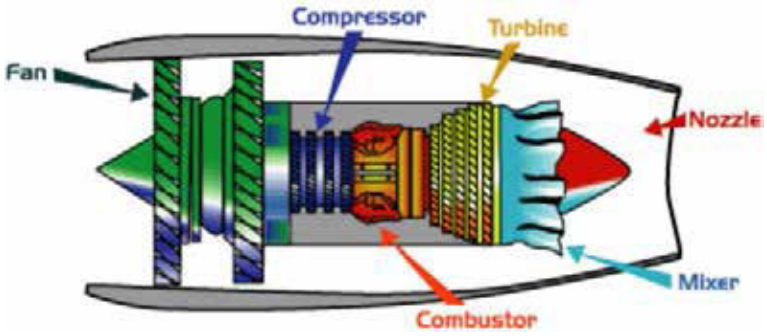


Figure A-2 Turbofan Engine

Note. From "Engines", *NASA Ultra Efficient Engine Technology*. Retrieved March 19, 2009, from http://www.ueet.nasa.gov/StudentSite/engines.html

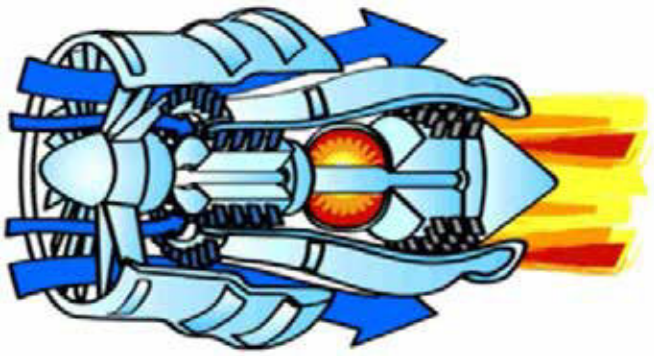


Figure A-3 Airflow Through a Turbofan Engine

Note. From "Engines", *NASA Ultra Efficient Engine Technology*. Retrieved March 19, 2009, from http://www.ueet.nasa.gov/StudentSite/engines.html

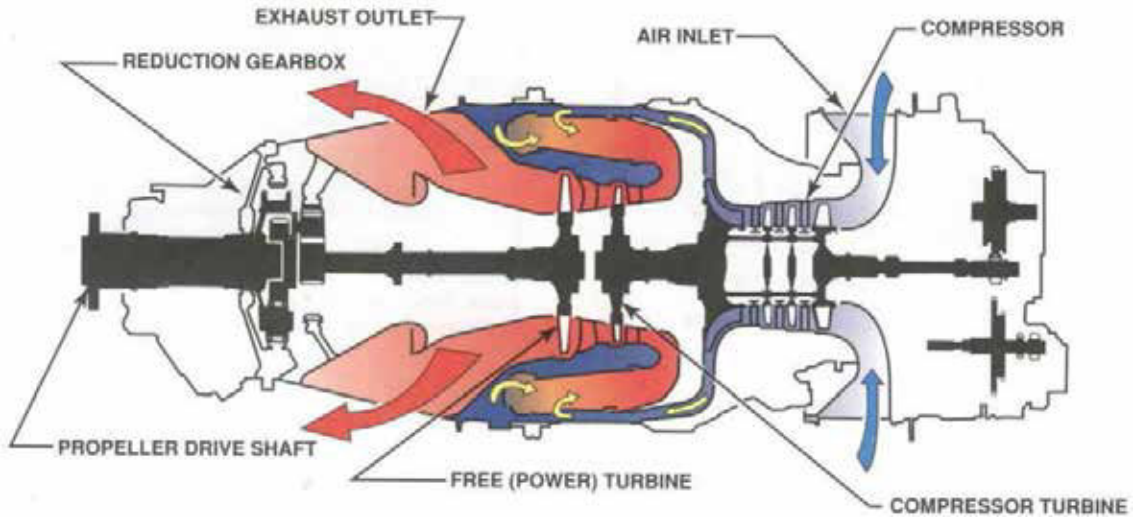


Figure A-4 Free Turbine Turboprop Engine

Note. From *A&P Technician Powerplant* (p. 3-6), by Jeppesen Standard Training Products, 2000, Englewood, CO:Jeppesen Sanderson Training Systems.