

CHAPTER 16

PO 326 – PERFORM EXPEDITION SKILLS



ROYAL CANADIAN ARMY CADETS

SILVER STAR

INSTRUCTIONAL GUIDE



SECTION 1

EO M326.01 – PREPARE FOR EXPEDITION TRAINING

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-703/PG-001, 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 necessary examples of outdoor clothing and equipment.

Obtain the necessary examples of high-energy snacks if available.

Obtain the updated version of the expedition centre joining instructions.

PRE-LESSON ASSIGNMENT

N/A.

APPROACH

An interactive lecture was chosen for this lesson to orient the cadets to expedition training and their responsibilities with regard to equipment.

INTRODUCTION

REVIEW

N/A.

OBJECTIVES

By the end of this lesson the cadet shall be expected to prepare for expedition training.

IMPORTANCE

It is important for cadets to understand the importance of preparing for expedition training to allow the cadet to be more comfortable. Reviewing the joining instructions prior to undergoing training will assist cadets in preparing for training.

Teaching Point 1**Discuss the Selection of Clothing, Footwear, and Personal and Group Equipment**

Time: 10 min

Method: Interactive Lecture



This TP is designed to familiarize cadets with the proper clothing and equipment to pack for expedition training.

This TP is an introduction to selection criteria for personal clothing and equipment as well as group equipment. Cadets should have some knowledge of this subject from previous information presented in Green and Red Star.

Have examples of outdoor clothing available if possible.

Customize the lesson to the anticipated weather for the respective expedition centre and its activities. Cadets should be advised to check the weather forecast prior to the training.

CLOTHING

The most effective way to maintain warmth and comfort in varying conditions is by using multiple layers of clothing, rather than just one. Layers allow one to build a microclimate that surrounds the body which can then be adapted to moisture, wind, temperature and exertion levels.



Remember:

- It is easier to stay warm than to try to warm up after getting cold.
- It takes more insulation to stay warm when sitting still than when moving.
- Heat is lost faster to a cold solid object through conduction than to cold air through convection, which is the transfer of heat by upward movement.

FOOTWEAR

Footwear is an important aspect of dressing for expedition training. Properly fitting, comfortable shoes/boots will make the cadet more comfortable during training. Low-ankle hiking boots are the ideal footwear. Finding shoes/boots that provide adequate ankle protection is important.



Combat boots or other military issue high-ankle support boots should not be worn during expedition training.

PERSONAL EQUIPMENT

Consult the joining instructions for a specific list of requisite personal kit.

Personal expedition equipment are items which benefit the participant and should be maintained by that person. Personal equipment is the kit the cadets need to carry on them.

Items to bring from home:

- **Hygiene Kit.** Includes all personal items required to maintain good health and hygiene. A hygiene kit should include:
 - camp soap (biodegradable),
 - toothbrush,
 - toothpaste,
 - toilet paper, and
 - facecloth or small towel.
- **Insect Repellent.** The active ingredient in bug repellent is DEET. Many brands are available and can be purchased at most grocery stores.
- **Lip Balm.** Lip balm with sunscreen will help protect lips. Lips burn easily at any elevation and cold dry winds can make lips crack and bleed.
- **Sunscreen.** A Sun Protection Factor (SPF) of 4 means that it will take four times longer to burn as when unprotected. Most sunburns can be prevented with a SPF of 15 with UVA and UVB protection, however an SPF of 30 or higher is recommended for most activities.
- **Sunglasses.** Protective eyewear.
- **Notepad and Pencil.** Allows for note taking/leaving a message in any situation.
- **Water Carrier.** A leak proof water bottle or canteen.
- **Camera.** Cameras are great to record new experiences.

Items that the expedition centre may provide:

- **Flashlight/Headlamp.** A flashlight/headlamp should always be carried; smaller is better to control weight (be sure to have a spare set of batteries and bulb before each trip). Headlamps allow for hands-free operation.
- **Matches.** At least 20 matches that can strike anywhere and are waterproof are best. Store matches with a striker in a separate container inside the kit (35 mm film cases would suffice).
- **Pocket Knife/Multi-tool.** Useful tool for many applications in the field. Hunting-type knives with long fixed blades are not appropriate for cadet activities.
- **Survival Kit.** Fill with useful items that are specific for the environment you will be travelling in.
- **Whistle.** For use as a signalling device in emergencies.
- **High-Energy Snacks.** As detailed in TP 2.



There may be a requirement for each participant to have a plate, a bowl and cutlery depending on food being consumed during expedition training.

GROUP EQUIPMENT

Group equipment should be selected for its versatility, weight and ease of use and packing. The more compact an item is or can become, the easier it will be to pack and carry.

Group equipment will be given to cadets upon arrival at the expedition centre.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

- Q1. What is the most effective way to maintain warmth and comfort in varying conditions?
- Q2. What is the ideal footwear for expedition training?
- Q3. What are the personal items a cadet should bring to the expedition centre?

ANTICIPATED ANSWERS

- A1. The most effective way to maintain warmth and comfort in varying conditions is by using multiple layers of clothing, rather than just one garment.
- A2. Low-ankle hiking boots are the ideal footwear for expedition training.
- A3. The personal items that should be brought to the expedition centre are:
- hygiene kit,
 - insect repellent,
 - lip balm,
 - sunscreen,
 - sunglasses,
 - notepad and pencil,
 - water carrier, and
 - camera.

Teaching Point 2

Discuss High-Energy Snacks

Time: 5 min

Method: Interactive Lecture



This TP is designed to introduce cadets to the importance of eating and snacking while performing high-energy activities.

Use actual food examples if available.

Food is one of the most important factors to consider when expending large amounts of energy during activities. Choosing the right snacks to supplement meals is important to maintain energy and nutrition.



People are more prone to injuries around 1100 hours and 1500 hours when blood sugar is low and people are tired from activities.

GRANOLA BARS

Granola bars are an easy snack that can be brought on the trail with little waste. The wrapper of the granola bar can be folded and placed in a resealable plastic bag for disposal. When eating on the move, the wrapper can simply be placed in a pocket.

Granola bars come in a variety of flavours and often include chocolate. The nutrition in granola bars is largely grain based and provides a high calorie count. Granola bars often have 10–14 grams of sugar and 11–16 grams of fat.



Stay away from granola bars with more than 20 percent fat. These bars will only impede energy levels.

DRIED FRUIT AND NUTS

Dried fruits last for months, and keeps most of their nutritional value. Dried fruit provides energy benefits without the added weight of 80 percent water content. Most grocery stores have varieties of mixed fruit, which can be dried at home.



Homemade Dried Apples

1. Slice the apples thinly.
2. Place on baking tray in a single layer.
3. Place in oven on a low temperature setting (60 degrees Celsius [140 degrees Fahrenheit]).
4. Check dryness every 20 minutes.
5. Crack open the oven door to remove moist air and improve result.

This process can take up to four hours.

Seeds and nuts are great sources of carbohydrates, protein and fat. Proteins are an essential part of any diet; known as the “don’t leave home without it” snack. The high fat content will slow digestion so seeds and nuts are best used for refuelling during longer breaks. Nuts also provide magnesium, guarding the muscles against burn from lactic acid.

CHEESE

A good source of dairy on the trail, cheese is a great form of calcium.



Cheese with a high moisture content does not keep well when not refrigerated for extended periods of time.

Cheeses with a low moisture content include:

- cheddar,
- colby, and
- swiss.

Cheeses with low moisture content can keep longer. The liquefied milk fat will run off at high temperatures. While this is not a pleasant sight, it is not a sign of spoilage.

“GOOD OLD RAISINS AND PEANUTS” (GORP)

“Good old raisins and peanuts,” is just that – a mixture of raisins, peanuts and anything else a person might want to add. There is often a sugar source like chocolate chips added to a dried fruit.

There are many varieties of GORP recipes. GORP can be bought in most groceries stores – pre-made – or made at home. Everyone has their favourite recipe. A person’s GORP may change every expedition depending on what is available, or what they feel like eating.



Small items like sunflower seeds will settle to the bottom of the bag while larger items will float to the top. Mix up the contents of the bag before eating.



Simple GORP Recipe:

- 118 mL (1/2 cup) peanuts,
- 118 mL (1/2 cup) raisins,
- 59 mL (1/4 cup) chocolate chips*, and
- 59 mL (1/4 cup) dried cranberries.

*In warmer weather, chocolate chips can be substituted with candy-coated chocolate which will not melt.

Mix in a bowl and store in an air tight container or resealable bag.

This makes a little more than 354 mL (1 1/2 cups). Add or take away items as you like.

Examples of food items to put in GORP:

- dried apples,
- banana chips,
- dried papaya,
- dates,
- dried cranberries,
- coconut,

- almonds,
- cashews,
- peanuts,
- chocolate,
- carob chips,
- candy-coated chocolate,
- chocolate or yogourt covered raisins,
- sunflower seeds,
- dried green peas, and
- pretzels.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

- Q1. When are people more prone to injuries on the trail?
- Q2. What nutrients are in nuts?
- Q3. What is GORP?

ANTICIPATED ANSWERS

- A1. People are more prone to injuries around 1100 hours and 1500 hours when blood sugar is low and people are tired from activities.
- A2. Nuts are great source of carbohydrates, protein and fat.
- A3. Good old raisins and peanuts. There is often a sugar source like chocolate chips added to dried fruit.

Teaching Point 3

Review, and Brief the Cadets on the Joining Instructions and Training Schedule for Silver Star Expedition Training

Time: 10 min

Method: Interactive Lecture



This TP is designed to introduce and brief cadets on what is required during training at the expedition centre.

Review joining instructions and after briefing cadets, answer any questions the cadets have.

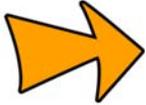
RISKS IN EXPEDITION TRAINING

Activities conducted at the expedition centres will likely include hiking, biking, canoeing and camping. With all adventure activities there are inherent risks. Risk is the chance or possibility of danger, loss or injury. Each activity has its own risks.

Hiking is the activity of walking outdoors on unpaved trails in a wilderness environment and may include many types of terrain and environments. It is not uncommon for cadets to be injured by tripping, falling and slipping over wet roots or rocks, or falling down a small slope.

Mountain biking is riding a bike on trails and secondary roads, using specialized equipment. Cadets are at risk of falling off the bike, or not using the bike properly which may cause injury. Injuries that may occur mountain biking are cuts and scrapes, bruising, flesh wounds, or broken bones.

Canoeing is travelling by canoe. Cadets should be seated, wearing PFDs and acting responsibly while canoeing. These actions will minimize the risks associated with canoeing.



Canoeing is of great cultural significance to Canadians and canoeing in expedition training allows cadets to see Canada's wilderness from a different perspective.



Refer to CATO 40-01, *Army Cadet Expedition Program* for general expedition information.

Medical Information

The Medical Information Form is located in A-CR-CCP-951/PT-002, Chapter 1, Annex B. This form must be completed by all cadets prior to undertaking expedition training. This form asks general questions regarding health.

Consent to Adventure Training

In addition to the medical form, the Consent to Adventure Training form, Chapter 1, Annex A to A-CR-CCP-951/PT-002, must be filled out by participating cadets. This form advises instructors and organizers that the cadet understands what they are undertaking and will comply with all rules and regulations.

Policies

Prior to participating in expedition training, all cadets shall be reminded of the following policies:

- CATO 11-08, *Environmental Stewardship Policy*,
- CATO 13-23, *Drug and Alcohol Policy*,
- CATO 13-24, *Harassment Prevention and Resolution Policy*,
- CATO 13-26, *Return To Unit Policy*, and
- CATO 15-22, *Cadet Conduct and Discipline Policy*.

JOINING INSTRUCTIONS

Joining instructions are issued to provide cadets with all the required information they may need to arrive at the expedition centre prepared and capable of performing the required training. They are issued for all activities outside of the local cadet corps.

Each region will have different joining instructions for each expedition centre.



Joining instructions for expedition training can be found at the regional website, through www.cadets.ca.

The joining instructions will have information such as:

- general information on the activity,
- directions to the expedition centre,
- dates of training,
- transportation requirements,
- what identification is required,
- administrative and claim information,
- rations and quarters information,
- uniform requirements,
- expected cadet conduct, and
- required kit list.

Joining instructions will often have a schedule/timetable included.

CONFIRMATION OF TEACHING POINT 3

The cadets participation in the briefing on the expedition centres training weekend will serve as confirmation of this TP.

END OF LESSON CONFIRMATION

The cadets participation in the briefing of the expedition centres training weekend will serve as confirmation of this lesson.

CONCLUSION

HOMEWORK/READING/PRACTICE

N/A.

METHOD OF EVALUATION

N/A.

CLOSING STATEMENT

Participating in a briefing on the local expedition centre, wearing clothing, and bringing equipment and snacks will better prepare cadets for the upcoming challenges of expedition training.

INSTRUCTOR NOTES/REMARKS

The joining instructions and timetable referred to in TP 3 will vary depending on the region. Instructors should acquire these from the local expedition centre.

This EO should be conducted in the two weeks preceding the cadet's Silver Star expedition centre training weekend.

REFERENCES

- A2-001 A-CR-CCP-951/PT-002 Director Cadets 3 (2006). *Royal Canadian Army Cadets Adventure Training Safety Standards*. Ottawa, ON: Department of National Defence.
- C2-051 (ISBN 978-0-7153-2254-3) Bagshaw, C. (2006). *The Ultimate Hiking Skills Manual*. Cincinnati, OH: David & Charles.
- C2-066 (ISBN 1-4000-5309-9) Curtis, R. (2005). *The Backpacker's Field Manual: A Comprehensive Guide to Mastering Backcountry Skills*. New York, NY: Three Rivers Press.



ROYAL CANADIAN ARMY CADETS

SILVER STAR

INSTRUCTIONAL GUIDE



SECTION 2

EO M326.02A – PADDLE A CANOE

Total Time:

165 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-703/PG-001, 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

N/A.

APPROACH

An interactive lecture was chosen for TPs 1–3, and TP 6 to orient the cadet, generate interest and present basic or background material on canoeing, canoeing equipment, and safety procedures.

Demonstration and performance was chosen for TPs 4, 5, and 9 as it allows the instructor to explain and demonstrate portaging a canoe, outfitting a canoe, and basic canoe strokes while providing an opportunity for the cadet to practice these skills under supervision.

Demonstration was chosen for TPs 7 and 8 as it allows the instructor to explain and demonstrate launching/landing and the canoe over canoe assisted rescue in a controlled environment.

A practical activity was chosen for TP 10 as it is an interactive way for the cadet to experience paddling a canoe in a safe, controlled environment during an expedition. The expedition contributes to the development of canoeing knowledge and skills in a fun and challenging setting on-water.

INTRODUCTION

REVIEW

N/A.

OBJECTIVES

By the end of this lesson the cadet shall have identified the parts of the canoe and the paddle; demonstrated how to: properly outfit a canoe with safety equipment, prepare for on-water activities and launch and land a canoe; performed a canoe over canoe assisted rescue; and performed basic canoe strokes.

IMPORTANCE

It is important for cadets to know the parts of the canoe and paddle, so they can respond to direction given by instructor when participating in canoeing activities. To ensure safety of individual cadets and those around them when canoeing it is critical that all cadets: understand how to outfit a canoe with the required safety equipment; know how to communicate with paddle and whistle signals; know how to properly fit a Personal Floatation Device (PFD); understand portaging, launching and loading procedures; have an awareness of emergency rescue procedures; and are able to manoeuvre their canoe on water.

Teaching Point 1

Identify the Parts of a Canoe

Time: 5 min

Method: Interactive Lecture



It is important that cadets can see the canoe and its parts. A canoe should be on site and as the parts are identified, the instructor or an assistant should point to the respective part.

There are many different styles of canoes. The technological improvements in canoe building have made it quite difficult to choose an ineffective canoe. Despite the advances in design, the basic elements of the canoe remain the same. The parts of the canoe are:

Bow. The bow is the front section of the canoe. The bow can be easily spotted by looking at the seats. There is more leg room between the end of the canoe and the bow seat.

Stern. The stern is the back section of the canoe; most of the steering is done from the stern.

Gunwales. Gunwales are the upper edges of the sides of the canoe.

Thwart. The thwart on a canoe is a crosspiece which is attached on either side to the gunwales, two-thirds of the way back from the bow. The thwart provides structure and support to the gunwales and to the hull.

Hull. The hull is the body of the canoe which displaces water and provides the buoyancy for the canoe.

Keel. The keel is a narrow strip that runs along the centre of the bottom of the hull from bow to stern. The keel helps to provide better tracking (movement in a straight line) and stability; as well as providing a small barrier between the ground and the hull.

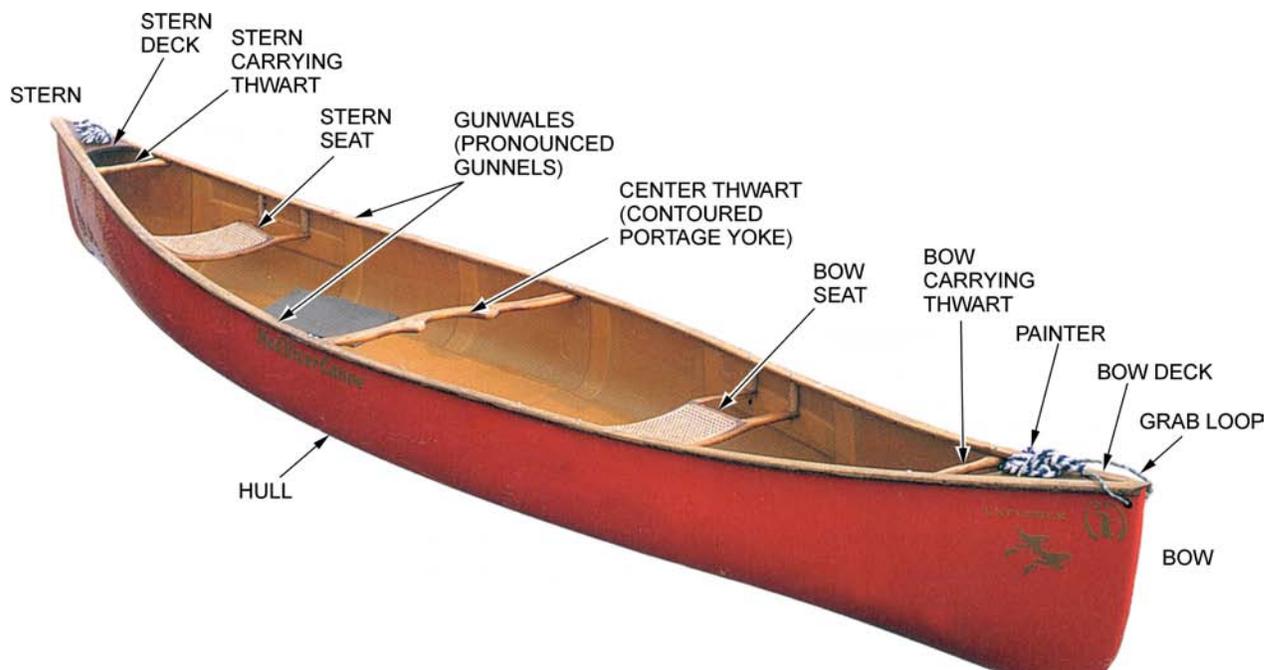
Bow Seat. The bow seat is located in the front (bow) of the canoe. It is further from the end of the canoe to provide leg room for the bow paddler.

Stern Seat. The stern seat is located in the back (stern) of the canoe. It is narrow and fastened to the gunwales closest to the rear of the canoe.

Bow Handle. The bow handle is a handhold at the bow, used for lifting and carrying. It is sometimes called the bow carrying thwart.

Stern Handle. The stern handle is a handhold at the stern, used for lifting and carrying. It is sometimes called the stern carrying thwart.

Deck Plate. The deck plate is a triangle piece of material that is fastened between the gunwales at both ends of the canoe. It is often called the bow deck and the stern deck. The deck plate provides a convenient handhold in the case of no bow or stern handle, as well as a place to attach a painter line.



G. McGuffin & J. McGuffin, *Paddle Your Own Canoe*, The Boston Mills Press (p. 13)

Figure 16-2-1 Parts of the Canoe

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

- Q1. What are the front and back of the canoe called?
 Q2. What is the hull?
 Q3. Where is the keel?

ANTICIPATED ANSWERS

- A1. The front and back of the canoe are called the bow and the stern.
 A2. The hull is the body of the canoe which displaces water and provides the buoyancy for the canoe.
 A3. The keel is at the bottom of the canoe, running from bow to stern.

Teaching Point 2

Discuss Paddles

Time: 5 min

Method: Interactive Lecture



Have a paddle available to help illustrate the parts.

The paddle is the most important piece of equipment required to canoe, with the exception of the canoe itself. The paddle provides the momentum to move the canoe.

PARTS OF A PADDLE

Shaft. The shaft is the narrow neck of the paddle between the grip and the blade.

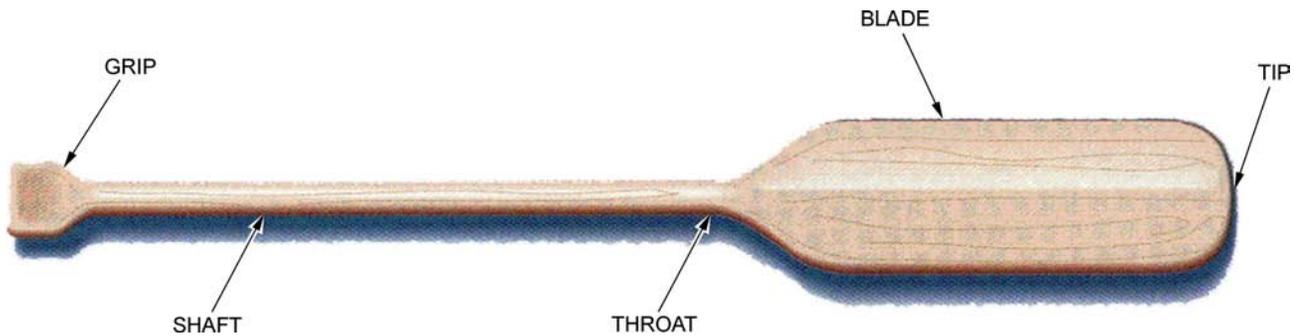
Grip. The grip is found at the top of the paddle shaft and is where the paddler holds the paddle.

Throat. The throat is located at the bottom of the shaft, where the paddler's shaft hand holds the paddle.

Blade. The blade is the part of the paddle that is placed in the water. The blade has two sides:

- **Power Face.** The power face is the side of the paddle blade that presses against the water during a forward stroke.
- **Back Face.** The back face is the side of the paddle blade that has no pressure against it during a forward stroke. The back face is the opposite side of the power face.

Tip. The tip is the very bottom edge of the paddle blade.



L. Guillon, Outdoor Pursuits Series: Canoeing, Human Kinetics Publishers (p. 21)

Figure 16-2-2 Parts of a Paddle

SIZING A PADDLE

When selecting a paddle, it is important to size it correctly. Torso length, canoe seat height and paddling style will determine the proper paddle length.

Most tandem paddlers will require a paddle length between 137 cm (54 inches) and 147 cm (58 inches). Shorter paddles allow for higher tempo strokes. If the grip hand is above the head during strokes, the paddle is too long.

 Paddle length will differ with individual preference, based on comfort and efficiency.

When choosing a paddle from a group of paddles, there are two ways to size a paddle.

1. Hold the paddle in both hands over your head with one hand on the grip and the other on the shaft, close to the throat. With the paddle rested on the head, the arms should be able to bend comfortably at the elbow in a 90 degree bend.
2. Hold the paddle in one hand and rest the blade on the top of the foot. The grip should come to the chin.

HOLDING A PADDLE CORRECTLY

The paddle is held in both hands. One hand will hold the grip (control hand) and the second hand, called the shaft hand, will hold the paddle somewhere between the shaft and the throat of the paddle. If the paddler has shorter arms, the shaft hand will be higher up on the shaft.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

- Q1. Where does the paddler hold the paddle?
 Q2. What is the shaft?
 Q3. What are the two sides of the paddle blade?

ANTICIPATED ANSWERS

- A1. The paddler holds the paddle at the grip and the throat of the shaft.
 A2. The shaft is the narrow neck of the paddle between the grip and the blade.
 A3. The two sides of the paddle blade are the power face and the back face.

Teaching Point 3

Discuss PFDs

Time: 10 min

Method: Interactive Lecture



Have a lifejacket and a PFD available to show the differences between each one to the cadets.

There are many people who use the water for both recreational activities and job-related duties. A lifejacket/PFD is used to assist in keeping a person afloat if they should fall into the water.



Government of Canada regulations state that anyone who is on and near the water, must have a Coast Guard/Transport Canada approved floatation device.

THE DIFFERENCE BETWEEN A LIFEJACKET AND A PFD

When in the water, a lifejacket is designed to keep the user's face up even if they are unconscious.

A PFD does not have the ability to turn the user face up but provides buoyancy (the ability to float without kicking or using arms).

Construction of a PFD

The Canadian Coast Guard regulates the construction of PFDs. When choosing a PFD, look for:

- Canadian Coast Guard/Transport Canada approved symbol;

- protection against hypothermia;
- allowance for maximum body movement;
- proper fit;
- ease of putting on and taking off; and
- rating for the user's weight.

Care Instructions for a PFD

Caring for a PFD is important in order to prolong its life.

The following is a list of PFD don'ts:

- dry clean,
- alter, or repair a PFD,
- use cleaners,
- leave in the sun for long periods,
- leave near direct heat (fires, radiators, hair dryer),
- place under heavy objects,
- use as a cushion or kneeling pad, or
- attach to a boat.

Before using a PFD it should be checked for:

- rips and tears,
- damage to seams and buckles, straps or zippers, and
- signs of waterlogging, mildew or hardening of the buoyant material.

FITTING A PFD

Fit is the most important thing when selecting a PFD. A PFD should:

- not be able to be pulled off easily,
- fit snugly, and
- be properly fastened.



A PFD must always be worn on and near water, and worn as the top layer.



Refer to A-CR-CCP-030/PT-001 *Water Safety Orders* for more information.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS

- Q1. What is the difference between a lifejacket and a PFD?
- Q2. What is the approving body for PFDs and lifejackets in Canada?
- Q3. How should a PFD fit?

ANTICIPATED ANSWERS

- A1. A lifejacket is designed to keep the user's face above water, while a PFD only provides buoyancy.
- A2. Canadian Coast Guard/Transport Canada is the approving body for PFDs and lifejackets in Canada.
- A3. A PFD should:
- not be able to be easily pulled off;
 - fit snugly; and
 - be properly fastened.

Teaching Point 4**Explain, Demonstrate and Have the Cadet Practice Portaging a Canoe**

Time: 15 min

Method: Demonstration and Performance



For this TP, it is recommended that instruction take the following format:

1. Explain and demonstrate each method of portaging while the cadets observe.
2. Explain and demonstrate each step required to complete each method of portaging. Monitor the cadets as they practice each step.
3. Monitor the cadets' performance as they practice each method of portaging.

Note: Assistant instructors may be used to monitor the cadets' performance.

CARRYING A CANOE TO THE WATER

Once a canoe is off the vehicle or trailer, it still needs to get to the water. There are several ways to carry a canoe; having one person at each end is a typical way. Hand and arm placement should allow for maximum comfort and provide balance and security against dropping.



It is critical that the canoe is not dragged along the ground. This damages the keel and the bottom of the canoe which may result in holes.

Tandem Hand Carry

For a short distance over relatively flat ground, a canoe can be carried much like a briefcase. This is referred to as the tandem hand carry.

To execute the tandem hand carry:

1. The bow paddler will stand at the bow on the left or right of the canoe.
2. The stern paddler will stand at the stern on the side opposite to the bow paddler.
3. Each paddler will lift the canoe by the handle at their end.



L. Guillon, Outdoor Pursuits Series: Canoeing, Human Kinetics Publishers (p. 36)

Figure 16-2-3 Tandem Hand Carry

Tandem Portage Carry

For longer distances, a canoe can be carried on the shoulders in the tandem portage carry. The canoe is lifted over the head and carried in such a manner that the stern seat rests across the shoulders of the person at the rear and the bow deck rests on one shoulder of the person in front.

To execute the tandem portage carry:

1. Stand up straight, with the legs slightly apart and knees bent. Grasp the gunwale closest to the body, near the bow and stern seats respectively. Place the fingers inside the gunwale and the thumbs outside the gunwale.
2. Keeping the back straight and knees bent, lift the canoe to the thighs in a rocking motion.
3. Reach across the canoe and grasp the far gunwale. The fingers are pointing out and the thumb is in. Reposition the hand from step one so that the fingers are out and the thumb is in.
4. Rocking the canoe again, use your legs to launch and lift the canoe over the head.
5. As the canoe is raised, turn to face the bow and then guide the bow and stern seats onto the shoulders.
6. Rest the weight of the canoe on the shoulders. The bow person will move further forward to improve visibility.
7. To move forward, the bow paddler hand-walks along the gunwale toward the front of the canoe. Balance the canoe's weight side to side and bow to stern.
8. Rest the deck plate on the bow paddler's shoulder.



Figure 16-2-4 (Sheet 1 of 2) Tandem Portage Carry Steps 1–8
A. Westwood, *Canoeing: The Essential Skills and Safety*, Heliconia Press (p. 136)



Figure 16-2-4 (Sheet 2 of 2) Tandem Portage Carry Steps 1–8

A. Westwood, *Canoeing: The Essential Skills and Safety*, Heliconia Press (p. 136)

CONFIRMATION OF TEACHING POINT 4

QUESTIONS

- Q1. Why does dropping a canoe normally occur?
- Q2. What are the different ways a canoe can be carried to the water?
- Q3. When the portage is very long, what is the best way of carrying the canoe?

ANTICIPATED ANSWERS

- A1. Dropping a canoe is usually caused by incorrect placement of the hands.
- A2. A canoe can be carried to the water by the tandem hand carry or the tandem portage carry.
- A3. When a portage is very long, the best way to carry the canoe is by the tandem portage carry.

Teaching Point 5

Explain, Demonstrate and Have the Cadet Practice Outfitting a Canoe With Safety Equipment

Time: 15 min

Method: Demonstration and Performance



For this skill TP, it is recommended that the instruction take the following format:

1. Explain and demonstrate the complete process of outfitting a canoe while the cadets observe.
2. Explain and demonstrate each step to outfit a canoe. Monitor the cadets as they practice each step.
3. Monitor the cadets' performance as they practice the complete skill of outfitting a canoe.

Note: Assistant instructors may be used to monitor the cadets' performance.

Every boat that enters the water has to be outfitted with certain safety equipment that is required by law. The Canadian Coast Guard and Transport Canada deem every canoe must have the following safety equipment:

BUOYANT HEAVING LINE OR THROW BAG

One buoyant heaving line not less than 15 m (49 ft) in length must be available for use in emergencies such as capsized paddlers. The heaving line shall be capable of floating and shall be attached using a figure-of-eight knot, or by clipping the throw bag to the thwart or bow handle.



A throw bag is a nylon rescue bag with a length of rope stuffed loosely inside, so it can pay out through the top when thrown to a person in the water.

BAILER

A bailer is any container capable of removing water from a canoe. It must be made of plastic or metal, with an opening of 65 cm² (25 in²) and a minimum volume of 750 mL (25 oz). The bailer will be attached to the thwart of the canoe using a clove hitch.

SPARE PADDLE

In addition to the paddles used by the paddlers, a third paddle is required in the case that one is lost, broken or forgotten on shore. The spare paddle should be secured, but immediately available in an emergency. Lashing the paddle into the canoe is not recommended.

WHISTLE

A pealess whistle or noise-making device is required to communicate with other paddlers and signal in case of emergency. The whistle is often attached to the paddler's PFD, if not, it should be worn on a cord around the paddler's neck.

WHITE NAVIGATION LIGHT

The white navigation light is a watertight flashlight complete with working batteries. This light can be used to signal other paddlers and during an emergency. It is attached to the bow plate using a carabiner or a piece of cordage.



The cadets are to be introduced to the requirement for a white navigation light as safety equipment, however, as cadets will not canoe at night, there is no requirement to use this device when outfitting a canoe.

PAINTER LINES

Painter lines are two lines 6 m (19 feet) in length made of 10 mm (0.3 inches) buoyant polypropylene rope, with no knots. The lines are attached to the bow (bow line) and stern (stern line) of a canoe. They are used for pulling the canoe through shallow water and securing it to the shoreline or other stationary object. Painter lines will be attached to the bow and stern handles using a re-woven figure-of-eight knot.

PFD

A vest style jacket filled with foam panels or tubes that provide buoyancy. A PFD must be worn when an individual is within 3 m (10 feet) or less of the shoreline, prior to or upon completion of an on-water activity and when they are on the water. It is important to ensure that the PFD is properly zipped and buckled prior to moving to the waters edge.



The A-CR-CCP-030/PT-001, states “the PFD shall always be worn over the outer layer of clothing. When worn, the PFD must have all fasteners and tighteners secured as they are intended to be used. A properly fitted PFD should be snug around the cadet’s upper body when in or out of the water. The PFD should not ride up to the cadet’s face when all fasteners and tighteners are fitted and secured. If it is riding up under these conditions, a smaller size is required.”



The A-CR-CCP-951/PT-002, states that one Canadian-approved PFD or lifejacket of appropriate size must be available for each person participating in on-water activities.

CONFIRMATION OF TEACHING POINT 5

The cadets’ participation in outfitting a canoe with safety equipment will serve as the confirmation of this TP.

Teaching Point 6

Discuss Safety Concerns While Canoeing

Time: 10 min

Method: Interactive Lecture



When completing any cadet training, safety is always the main concern. This is also the case when cadets are in an unknown area or unfamiliar terrain, such as a body of water. It is important to consider hazards and to get to know the strengths and limitations of the members of the group.

Discuss responsibilities on water and passing procedures.

UNDERSTAND PERSONAL RESPONSIBILITIES

Skill Level

It is the responsibility of the paddler to ensure that they have the proper skill set for paddling. Participants should always advise staff when they feel uncomfortable or unprepared for any aspect of canoe training.

Physical Fitness

Fitness and well-being are an important part of canoeing. Individuals must take responsibility for themselves. Every paddler must make sure they are physically and mentally prepared for paddling.

Physical preparedness includes having the endurance to be able to paddle the entire trip. The paddler should not be suffering from a cold or illness, and should not have any physical injuries, such as cramped or sore muscles.

IDENTIFY PADDLE SIGNALS



When explaining paddle signals, it is important for cadets to see the signal in action. Demonstrate all paddle signals.

The water can be a noisy place. Using a whistle, paddle or gestures are the best ways of getting the attention of other paddlers.

Before heading out on any body of water, it is important to know and understand universal paddle signals. Paddle signals are important in times when there is distance between canoes and it is difficult to hear. Good communication on the water is essential to prevent accidents and ensure swift emergency response.



When receiving a signal, it is important to repeat the signal to the sender and pass the signal on to paddlers behind.

Paddle signals are used to alert the entire group to the direction of travel or to an unexpected situation, such as an overturned canoe.

Stop. To communicate the stop signal, form a horizontal bar with the paddle and move with an up and down motion until remaining paddlers see it. If you are already stationary, stay where you are. Wait for the all clear signal before proceeding.



J. Rounds, Basic Kayaking: All the Skills and Gear You Need to Get Started, Stackpole Books (p. 83)

Figure 16-2-5 Stop



Paddle signals should be given to indicate the direction of travel; not the location of the obstacles.

Help Required/Emergency. To communicate the help required/emergency signal, a paddle, helmet or a bright object (not a PFD) are waved in a continuous motion side to side above the head. This means “assist the signaller as quickly as possible”.

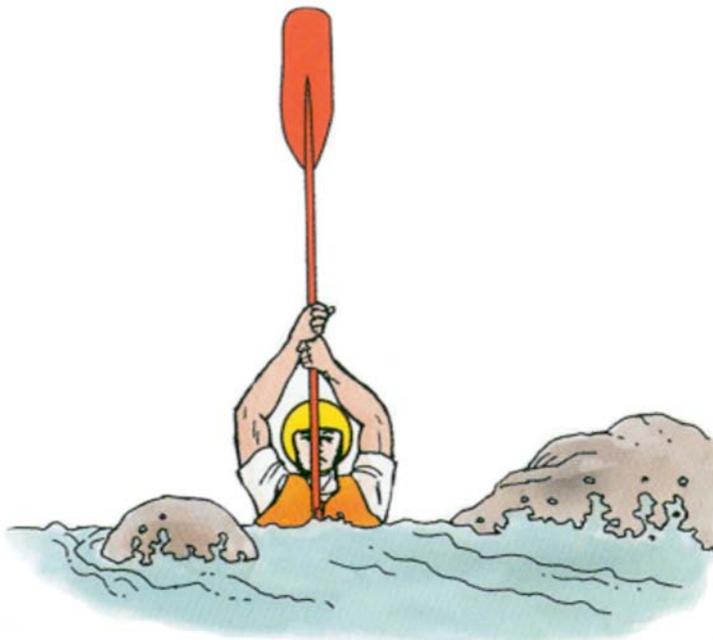


J. Rounds, Basic Kayaking: All the Skills and Gear You Need to Get Started, Stackpole Books (p. 83)

Figure 16-2-6 Emergency

Raft Up. To communicate the raft up signal, raise the paddle vertically above the head and move in a circular motion. This signal means “come to me”.

All Clear. To communicate the all clear signal, extend the paddle over the head vertically. Maintain the paddle in the air in order to ensure that all members of the group have seen the signal. This signal is used when it is safe to continue on and indicates that there are no obstructions or danger ahead.



J. Rounds, Basic Kayaking: All the Skills and Gear You Need to Get Started, Stackpole Books (p. 83)

Figure 16-2-7 All Clear

IDENTIFY WHISTLE SIGNALS



When explaining whistle signals, it is important for cadets to hear the signal in action. Demonstrate all whistle signals.

A whistle is an effective way to get the attention of other paddlers when visibility is limited and there is a lot of noise. Before heading out on any body of water, it is important to know and understand universal whistle signals. Good communication on the water is essential to prevent accidents and ensure swift emergency response.



Cadets shall be reminded that they will not play with or blow whistles unless they are in an emergency situation.

Universal Distress Signal. Three whistle blasts indicate that there is an emergency. All action should stop, and action should be taken for the emergency. This signal means: assist the signaller as quickly as possible.



J. Rounds, Basic Kayaking: All the Skills and Gear You Need to Get Started, Stackpole Books (p. 83)

Figure 16-2-8 Universal Distress Signal

Move to Shore/Raft Up. This signal indicates that there is a need for the group to get together. When two whistle blasts are heard, all personnel will look to the instructor or group leader for instructions and guidance on where to meet up, whether to move to the shore or to raft up at a given point. It should only be used when other forms of communication are not working.

All Clear/Look at Me. When one whistle blast is heard, focus attention on the instructor (look at me). It is used to get the attention of the group. This signal could also mean all clear.



As there are alternative meanings for one and two whistle blasts, it is imperative that the group understands what the signal means for their group. The team/group leader will specify before moving to the water.



Any series of three signals such as three whistle blasts or three horn blasts indicates an emergency. Immediately stop all activity and assist.

CONFIRMATION OF TEACHING POINT 6

QUESTIONS

- Q1. What are the personal responsibilities of the paddler when canoeing?
- Q2. What is the paddle signal for raft up?
- Q3. What action is to be taken when two whistle blasts are heard?

ANTICIPATED ANSWERS

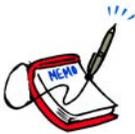
- A1. The personal responsibilities of the paddler include:
- making sure they are physically prepared; and
 - ensuring that they have the proper skill set.
- A2. To signal raft up, the paddler will raise their paddle vertically above the head and move it in a circular motion.
- A3. When two whistle blasts are heard, all personnel will look to the instructor or group leader for instructions or guidance on where to meet up.

Teaching Point 7

Explain and Demonstrate Launching and Landing a Canoe

Time: 10 min

Method: Demonstration



For this teaching point, it is recommended that instruction take the following format:

1. Explain and demonstrate launching and landing a canoe while the cadets observe.
2. Explain and demonstrate each step required to complete the skill.

Note: Cadets will be given the opportunity to practice this skill during the on-water training and the practical activity.

IDENTIFYING A LOCATION

Putting a canoe on water and taking it out of water should be done carefully, smoothly and without damage to the canoe.

The ideal location to launch a canoe is a soft shore or beach where the water is calm. Avoid locations where there are large rocks, stumps and roots, strong wind or large waves.

If you are launching from a shallow beach, launch the canoe at a right angle to the beach and hold it with its stern touching the bottom at the water's edge.

AVOIDING EQUIPMENT DAMAGE

A canoe should not be pushed, pulled or slid in or out of the water on a beach, bank, or dock. When launching, it is best to lay the canoe in the water from a lift position. It should be raised with the same care when being taken out of the water.

The canoe should be empty when launching. Once the canoe is placed on the water, it can be loaded with equipment while it is floating.

ENTERING A CANOE

Getting into a canoe for the first time is difficult; with practice, it will become easier. The stern paddler should always hold the canoe steady while the bow paddler enters. Likewise, once the bow paddler has entered the canoe, they will steady the canoe, using their paddle and body, while the stern paddler enters.

The steps for getting into a canoe are:

1. Keep the body low at all times, to lower the centre of gravity; never stand in a canoe.
2. Place the paddle shaft across the gunwales for stability.
3. Grasp both gunwales and step into the canoe over the centreline.
4. Step along the centreline and slide the hands and paddle along the gunwales to move to the seat.

LAUNCHING A CANOE

Launching at a Shoreline



Launching and landing a canoe in waves is inadvisable. Wait for a lull and keep the canoe at a right angle to the water.

If the canoe swamps at any time, avoid getting between the canoe and the shore. A canoe full of water weighs approximately 1 ton (1 000 kg) and can seriously injure a paddler.

There are several ways to launch a canoe from shore. The most common is the bow first launch:

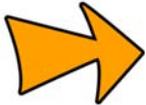
Procedure for the bow first launch:

1. Put on a PFD and have paddles in the canoe or on the shoreline. Set the canoe at a right angle to the shore.
2. Place the spare paddle and stern paddle in the centre of the canoe. Have the stern paddler hold the canoe while the bow paddler walks up the length of the canoe keeping low, along the centreline. Stability is maintained by keeping the paddle shaft across the gunwales.
3. Have the bow paddler sit or kneel and place the paddle in the ready position as detailed in Figure 16-2-9. The stern paddler will hold the paddle shaft across the gunwales for stability.
4. Have the stern paddler slide their paddle forward along the gunwales, continuing to hold both paddle shaft and gunwales. The blade is positioned on the side opposite to the bow paddlers' paddling side.
5. Once the stern paddler is kneeling and in the ready position move the canoe away from the shore.



G. McGuffin & J. McGuffin, Paddle Your Own Canoe, The Boston Mills Press (p. 36)

Figure 16-2-9 Bow First Launch



On windy days, the canoe should be faced directly into the wind when launching.

Launching at a Dock

Procedure for a dock launch:

1. Put on a PFD and have paddles in the canoe or on the dock. Pick the canoe up in the middle and lower it hand-over-hand into the water perpendicular to the dock.
2. Place the spare paddle in the centre of the canoe. Have the stern paddler swing the canoe parallel to the dock (bow facing into the wind if any). The bow has more buoyancy, so have the bow paddler get in first while the stern paddler steadies the canoe.
3. From a crouched position on the dock, have the stern paddler steady the bow end by holding the paddle shaft across the gunwales, with the blade extended toward the paddling side. Have the bow paddler step in, keeping low and over the centreline.
4. Have the bow paddler kneel, holding their paddle in the ready position as detailed in Figure 16-2-9. The stern paddler will steady the canoe by positioning their paddle across the gunwales. With the blade on the paddling side and still holding the dock, step in keeping weight low and balance over the centreline.
5. When the stern paddler is in the ready position, move the canoe away from the dock.



G. McGuffin & J. McGuffin, *Paddle Your Own Canoe*, The Boston Mills Press (p. 35)

Figure 16-2-10 Dock Launch

LANDING A CANOE

Landing at a Shoreline

When a suitable location to exit the canoe is found, the following procedure shall be followed:

1. Bring the canoe into landing without running up on shore.
2. Have the bow paddler exit first to steady the canoe for the stern paddler.
3. Have the stern paddler move forward, keeping their weight low in the canoe.
4. Have the stern paddler exit at the bow.

Landing at a Dock

1. Bring the canoe into landing without running into the dock.
2. Have the stern paddler hold the dock and steady the canoe while the bow paddler exits the canoe.
3. From a crouched position on the dock, have the bow paddler hold the canoe steady next to the dock for the stern paddler.
4. Have the stern paddler exit the canoe by keeping low and stepping to the dock.

EXITING A CANOE

To exit the canoe, reverse the entry procedures:

1. Bring the canoe into the landing slowly and carefully.
2. Keep the body low at all times, lowering the centre of gravity.
3. Place the paddle shaft across the gunwales for stability.
4. Grasp both gunwales and the paddle shaft, and move to the bow of the canoe.
5. Step out of the canoe, keeping weight low.

CONFIRMATION OF TEACHING POINT 7

QUESTIONS

- Q1. When launching from shore, which paddler is first to enter the canoe?
- Q2. How is a canoe launched in the wind?
- Q3. How is a canoe brought to the dock for landing?

ANTICIPATED ANSWERS

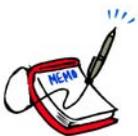
- A1. When launching from shore, the bow paddler is the first to enter the canoe.
- A2. On windy days, the canoe should be launched directly into the wind.
- A3. The canoe is brought to the dock for landing carefully without running into the dock to avoid damaging the canoe.

Teaching Point 8

Explain and Demonstrate Action on Capsizing

Time: 15 min

Method: Demonstration



For this skill TP, it is recommended that instruction take the following format:

1. Discuss the process a rescuer will follow in the event that a canoe has capsized, including the responsibilities of the cadet and what the rescuer will and will not do to assist them.
2. Explain and demonstrate the canoe over canoe assisted rescue while the cadets observe.
3. Explain and demonstrate the steps required to complete a canoe over canoe assisted rescue.

Note: Cadets will be given the opportunity to practice this skill during the on-water training and the practical activity.

Although strong rescue skills are important, preventing rescues by making careful, informed decisions will reduce the chances of capsizing. Anticipating changes in weather, actions of other paddlers and being properly trained will aid in the prevention of accidents.

RESCUE PRIORITIES



The priority of rescue is listed below, but rescuers will only initiate rescue if it is safe to do so without harm to themselves.

When carrying out rescues, it is imperative that every individual involved be aware of the priorities of rescue. The rescue priorities are:

Rescuer. Rescuer safety is priority. The rescuer should not complete any part of the rescue that is beyond the scope of the rescuer's ability. Another casualty will only escalate the emergency.

People. The paddler(s) in the water. Each paddler will make sure they are okay, and that their partner is okay. If they cannot see their partner, they must establish voice contact to confirm that their partner is conscious, not seriously injured and is preparing to self-rescue.

Canoes. Canoes will be retrieved once all the paddlers in the water are safe.

Equipment. Equipment is the last thing to be retrieved as it is not essential. Clothing and food can be shared if need be.



If involved in a high risk rescue, the rescuer or rescue team should be prepared and trained to perform effectively and efficiently and follow the procedures.



Cold water and wind will accelerate the loss of body heat. People can become hypothermic very quickly, even in warm weather.

TANDEM CANOE OVER CANOE ASSISTED RESCUE

The canoe over canoe assisted rescue is the universal rescue means.



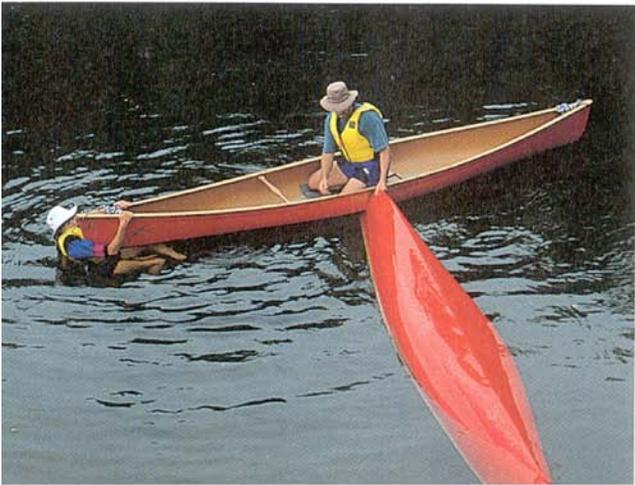
The figures below depict two solo paddlers completing a canoe over canoe assisted rescue. The procedure is virtually the same as a tandem rescue with only minor adjustments, which are detailed in the numbered procedure. Use the figures as a guideline.



STEP 1



STEP 2



STEP 3



STEP 4

Figure 16-2-11 (Sheet 1 of 2) Tandem Canoe Over Canoe Assisted Rescue

G. McGuffin & J. McGuffin, *Paddle Your Own Canoe*, The Boston Mills Press (p. 36)



STEP 5



STEP 6



STEP 7



STEP 8

Figure 16-2-11 (Sheet 2 of 2) Tandem Canoe Over Canoe Assisted Rescue

G. McGuffin & J. McGuffin, Paddle Your Own Canoe, The Boston Mills Press (p. 36)

The procedure to follow in a tandem canoe over canoe assisted rescue is:

1. One paddler will swim to the stern of a rescue canoe, hang on and get as much of the body out of the water as possible.
2. The second paddler will swim to the far end of the canoe.
3. The rescuers will lift up on the capsized canoe as the second paddler pushes down on the opposite end of the canoe to break the suction.
4. The second paddler will then move to the bow of the rescue canoe, hang on and get as much of the body out of the water as possible.
5. Both paddlers will remain in that position until told to move by the rescuers. The rescuers will move the canoe across the gunwales of their canoe. Once it is centred they will flip it over and gently continue to slide it into the water.
6. Maintain communication and when instructed to do so the paddlers will, one at a time, get back into the canoe by one of two ways:

- a. hook one leg over each canoe and pull up out of the water and climb into the canoe; or
 - b. propel themselves upward by scissor kicking, tucking the shoulder in and rolling into the canoe.
7. Return to the paddling position.

CONFIRMATION OF TEACHING POINT 8

QUESTIONS

- Q1. What are the rescue priorities?
- Q2. When shall the rescuer stop a rescue?
- Q3. What are the two methods which can be used to re-enter a canoe after a capsizing?

ANTICIPATED ANSWERS

- A1. The rescue priorities are rescuers, people, canoes and equipment.
- A2. The rescuer shall stop a rescue when they are in danger themselves, or the rescue is beyond their scope of knowledge.
- A3. The two methods a paddler can use to re-enter a canoe after a capsizing are:
- hook one leg over each canoe and pull up out of the water and climb into the canoe; or
 - propel themselves upward by scissor kicking, tucking the shoulder in and rolling into the canoe.

Teaching Point 9

Explain, Demonstrate and Have the Cadet Practice Strokes

Time: 35 min

Method: Demonstration and Performance



For this skill lesson, it is recommended that instruction take the following format:

1. Explain and demonstrate each stroke while the cadets observe.
2. Explain and demonstrate each step required to complete each stroke. Monitor the cadets as they practice each step.
3. Monitor the cadets' performance as they practice each stroke.

Note: Time devoted to practice during this TP will be limited due to time constraints, however, cadets will be provided additional time to practice individual strokes during the practical activity.



Kneeling is the position of choice for paddling because it provides increased canoe stability. When a person kneels, their centre of gravity is lowered. To give sore knees a break, a paddler can sit on the seat.



There are four phases of a stroke that help ensure the transition between each stroke is natural and smooth.

Catch. The beginning of the stroke where the blade is inserted into the water. **Power.** The movement of the paddle through the water by rotating the torso to transmit power to the blade. When paddling, it is important to use the muscles of the torso, which have more strength and endurance than the arm muscles.

Exit. When the paddle leaves the water.

Recovery. When the paddle is returned to the catch position. This is completed by feathering the blade (keeping it flat and just above the water surface) to minimize wind resistance.



The stern paddler will control the direction of the canoe using corrective strokes where applicable. The bow paddler will complete mostly power strokes when canoeing, unless the stern paddler requires assistance with corrective strokes.

POWER STROKE

The power stroke is used to move the canoe forward. It is the foundation stroke on which most other strokes are built. The power stroke is made close to the side of the canoe and parallel to the keel, with the shaft of the paddle moving in a vertical or near-vertical plane. To complete the power stroke:

1. Rotate the torso forward toward the bow to engage the muscles for the stroke.
2. Place the blade deep into the water with as little splash as possible.
3. Unwind the torso while pulling on the shaft hand (lower hand) and pushing with the control hand (upper hand).
4. Power the stroke through the water until the blade of the paddle is in line with the knee.
5. Lift the paddle out of the water by slicing it out to the side.
6. Recover the stroke with the blade clear and flat across of the water (to reduce wind resistance) and complete another stroke.



A. Westwood, *Canoeing: The Essential Skills and Safety*, Heliconia Press (p. 71)

Figure 16-2-12 Power Stroke

J-STROKE



Watch for ruddering as the cadets' practice the J-stroke. Ruddering is when the stern paddler places their paddle in the water behind the hip and manoeuvres it back and forth to turn the canoe. This will create drag and slow the forward momentum of the canoe.

The J-stroke is a version of the power stroke used as a corrective stroke by the stern paddler to help keep the canoe travelling in a straight line. When applied with force, it can be used to turn the canoe to the stern paddler's side (the side they are paddling on). To complete the J-stroke:

1. Complete the first four steps of the power stroke, ending with the control hand above the gunwale and the shaft hand at the hip.
2. Twist the control hand thumb forward and down while pulling the shaft hand inward, forming a "J".
3. Recover to complete another stroke.



A. Westwood, *Canoeing: The Essential Skills and Safety*, Heliconia Press (p. 74 and p. 75)

Figure 16-2-13 J-Stroke

FORWARD SWEEP

The purpose of the forward sweep is to turn the canoe away from the canoeist's paddling side. It is a wide sweep of the paddle, using the power face of the blade. There are many occasions when this stroke would be used, such as:

- swinging the canoe for pivot turns or partial turns;
- manoeuvring the canoe around obstacles;
- following along the bends of streams or rivers;

- making sudden changes of direction in paddling;
- aiding in holding a straight course in crosswinds; and
- incorporating with other strokes as necessary to control the canoe.



Reverse sweeps use the back face of the blade and are the opposite of forward sweeps. Both sweeps have many of the same functions.

As the bow paddler, to complete the forward sweep:

1. Rotate the torso and bend forward slightly while immersing the blade of the paddle almost horizontally by the bow of the canoe.
2. Push the shaft hand out slightly from the waist while swinging in a 90 degree arc until the arm extends out from the hip (the paddle should be at a right angle to the side of the canoe).
3. Recover to complete another stroke.

As the stern paddler, to complete the forward sweep:

1. Lean back slightly as the upper body rotates while extending and immersing the paddle almost horizontally at a right angle to the side of the canoe at the hip, keeping the lower hand at waist height with the thumb pointing up.
2. Push out slightly with the shaft hand while swinging in a 90 degree arc (the paddle should be almost touching the stern).
3. Recover to complete another stroke.



When the bow paddler is completing a forward sweep, the stroke should never move past the paddler's body. Any further movement will result in drag and loss of momentum.



STEP 1



STEP 2



STEP 3

G. McGuffin & J. McGuffin, *Paddle Your Own Canoe*, The Boston Mills Press (p. 51)

Figure 16-2-14 Forward Sweep

DRAW

The purpose of the draw is to turn the canoe or to move it sideways. The draw stroke can be completed by both the bow and stern paddler. To complete the draw stroke:

1. Rotate the torso and extend the arms fully to position the paddle at the side of the canoe, adjacent to the knee.
2. Reach across the canoe with the control hand and place the paddle vertically into the water.
3. Plant the blade deeply in the water and pull the power face toward the body.
4. Twist the control hand thumb away from the body and rotate the blade 90 degrees (before the blade hits the canoe).
5. Bring the paddle back to the beginning position by slicing it through the water.

6. Twist the blade back into the original position to complete another stroke.



A. Westwood, *Canoeing: The Essential Skills and Safety*, Heliconia Press (p. 95)

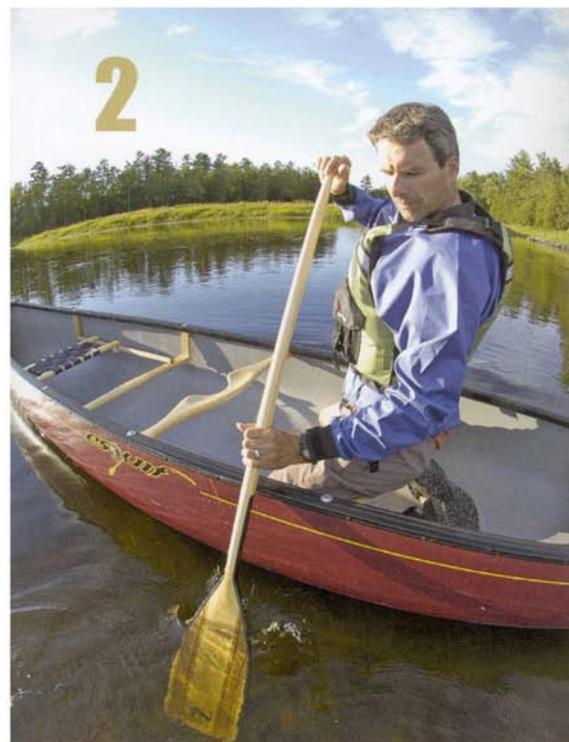
Figure 16-2-15 Draw

PRY

The pry is a powerful, deep-water stroke that can be applied by the bow or the stern paddler to move the canoe away from the paddler's side. To complete the pry stroke:

1. Place the paddle vertically against the gunwale adjacent to the knee with both hands above the gunwale.
2. Pull inward with the control hand to force the paddle away from the canoe.

3. Rotate the blade 90 degrees by twisting the thumb of the control hand away from the body and slicing the blade back to the beginning point.



A. Westwood, *Canoeing: The Essential Skills and Safety*, Heliconia Press (p. 96)

Figure 16-2-16 Pry



If the bow paddler completes a pry and the stern paddler completes a draw, the canoe will move sideways. This combination of strokes could be useful if trying to move a canoe parallel to a dock or when rafting up.

LOW BRACE

The low brace will assist in righting a canoe from capsizing or if it begins to tip. This stroke will also help a paddler rely on the paddle to steady the canoe as well as lean into turns. It can also be used by the stern paddler to steady the canoe when the bow paddler is initiating a turn. To complete a low brace:

1. Twist the upper body to face the water, with the paddle out at a 90 degree angle to the canoe.
2. Smack the water with the flat backside of the paddle to provide support to balance the body in the canoe.
3. Begin to get the knees level in the canoe by dropping the head towards the shaft of the paddle.
4. Assume a stable posture with the head centred inside the canoe once the canoe has levelled.



A. Westwood, *Canoeing: The Essential Skills and Safety*, Heliconia Press (p. 98 and p. 99)

Figure 16-2-17 Low Brace

JAM

The jam stroke will stop a canoe's forward momentum quickly when applied. To execute the jam, the paddler will shove the paddle into the water at a right angle to the canoe in a vertical position.

BACKPADDLING

To go backward, the bow paddler can complete a reverse power stroke. If necessary, the stern paddler can do a pry in the beginning to steady the canoe. To backpaddle:

1. Lean slightly back, rotate the shoulders back and place the blade of the paddle vertically in the water at the rear of the canoe up to the throat.
2. Unwind the body while pushing forward with the shaft hand and pulling with the control hand.
3. Continue with the stroke until the shoulders are square with the gunwales.
4. Lift the blade out of the water and recover to complete another stroke.



A. Westwood, *Canoeing: The Essential Skills and Safety*, Heliconia Press (p. 98 and p. 99)

Figure 16-2-18 Backpaddling



If both paddlers are backpaddling, the canoe will turn away from the bow paddler's side.

CONFIRMATION OF TEACHING POINT 9

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

Teaching Point 10**Have the Cadet Practice Canoe Skills During an Expedition**

Time: 40 min

Method: Practical Activity



The cadets shall receive feedback during and after the activity. Have each cadet perform the strokes individually. When completing strokes, watch closely for the following:

Power Stroke

The cadet shall lean forward, place the paddle vertically into the water up to the throat, rotate the torso while pulling on the shaft hand and pushing with the control hand until the paddle is just past the knee and in line with the hip, then slice the blade out of the water and then recover.

J-Stroke

The cadet shall lean forward, place the paddle vertically into the water up to the throat, rotate the torso while pulling on the shaft hand and pushing with the control hand, ending with the control hand above the gunwale and the shaft hand at the hip, twist the control hand thumb forward and down while pulling the shaft hand inward to form a "J", then slice the blade out the water and then recover.

Forward Sweep

The cadet shall lean back, extend and immerse the paddle from the hip so it is horizontally at a right angle to the side of the canoe, pushing out and pulling with the shaft hand, swing the paddle in a 90 degree arc to the stern of the canoe, then slice the blade out of the water and then recover.

Draw

The cadet shall rotate the torso and extend the arms fully to the side of the canoe, adjacent to the knee, reach across the canoe with the control hand, plant the paddle vertically into the water, pull the power face toward the canoe, twist the control hand thumb away from the body, rotate the blade 90 degrees just before it hits the canoe and then slice it through the water back to its original position.

Pry

The cadet shall place the paddle vertically against the gunwale adjacent to the knee with both hands above the gunwale, pull inward with the control hand to force the paddle away from the canoe, rotate the blade 90 degrees by twisting the thumb of the control hand away from the body and then slice the blade back to the beginning point.

ACTIVITY**OBJECTIVE**

The objective of this activity is for the cadets to participate in a practical expedition activity to practice canoe strokes in a controlled environment for an extended period of time.

RESOURCES

- Canoe equipment, to include:
 - Tandem canoe (one per two cadets),
 - Paddle (three per canoe),
 - PFD (one per cadet),
 - Whistle (one per cadet),
 - Bailer (one per canoe),
 - Painter lines (two per canoe), and
 - 15 m buoyant heaving line or throw bag (one per canoe);
- Water carrier (one per cadet),
- Topographical map of the area (two per team/group),
- Compass (one per team/group),
- Communication device (two per team/group),
- GPS Receiver (one per team/group),
- Batteries (spares for communication device and GPS), and
- First aid kit (one per team/group).

ACTIVITY LAYOUT

- All canoes must be ready to launch.
- All canoes must be outfitted.
- Designated expedition canoe route.

ACTIVITY INSTRUCTIONS

1. Place cadets in canoe partners.
2. Assign a bow and stern paddler (groups will be required to switch half-way through the activity).
3. Allow each group of cadets to launch their canoe, one at a time.
4. Have the cadets practice strokes to paddle in a straight line, turn 180 degrees and stop for the first half of the designated route.
5. Have each group complete a canoe over canoe assisted rescue.
6. Have the cadets land their canoes, switch positions and launch again.
7. Have the cadets practice strokes to paddle in a straight line, turn 180 degrees and stop for the remaining portion of the route.
8. Have the cadets land their canoes and store equipment.



When on the water, observe stroke technique and correct the cadets when necessary.

SAFETY

- All cadets must wear their PFDs at all times.
- The cadets must respect the pre-determined boundaries for this activity.
- Teams/groups will travel in single file.
- Teams/groups will not pass another team/group unless directed to do so by their team instructor.
- All the cadets must have at least 500 mL (16 oz) of water.

CONFIRMATION OF TEACHING POINT 10

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

END OF LESSON CONFIRMATION

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

CONCLUSION

HOMEWORK/READING/PRACTICE

N/A.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-703/PG-001, Chapter 3, Annex B, Appendix 7 (326 PC).

CLOSING STATEMENT

Canoeing is one of three dynamic modes of transport that can be used during expedition training. It is critical that the cadets understand the importance of following canoe safety procedures while on the water. Being able to manoeuvre a canoe on an expedition will provide a great sense of freedom and accomplishment. While there are many different strokes cadets should know prior to setting out on a canoe trip, these strokes will take a long time to master but the more they are used, the more comfortable they will feel.

INSTRUCTOR NOTES/REMARKS

Expedition centres are required to select two dynamic modes of travel from EO M326.02a (Paddle a Canoe), EO M326.02b (Ride a Mountain Bike, Section 3), and EO M326.02c (Hike Along a Route, Section 4) to incorporate into their weekend training.

This EO has been allocated five and a half periods in the overall course period allocation. Each expedition centre may adjust this allocation to reflect the choice of activities, facilities and available resources at the expedition centre.

Upon arrival at the expedition centre, cadets will be divided into teams/groups. These teams/groups will remain the same for the duration of the weekend.

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ROYAL CANADIAN ARMY CADETS

SILVER STAR

INSTRUCTIONAL GUIDE



SECTION 3

EO M326.02B – RIDE A MOUNTAIN BIKE

Total Time:	180 min
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PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-703/PG-001, 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.

Every cadet must have a water carrier prior to the start of this lesson.

All mountain bikes and helmets being used should be organized by size prior to the start of this lesson.

For TP 3 select a mountain bike to use as a model when identifying the parts of the bike. These parts should be labelled on the bike using gear or masking tape.

Choose a location that is large enough to allow the cadets to ride and practice mountain bike techniques as they are presented, but not too large that control is compromised. The area should have some hills and varied terrain.

Have cleaning materials available to complete the pre-ride and post-ride check.

Timings for this EO will vary. While there is a requirement for initial training, the focus should be on having the cadets complete each technique through the practical activity in TP 7.

PRE-LESSON ASSIGNMENT

N/A.

APPROACH

An interactive lecture was chosen for TPs 1 and 2 to introduce the principles of safe riding and provide an overview of the parts of a mountain bike.

Demonstration and performance was chosen for TPs 3, 4, 6 and 8 as it allows the instructor to explain and demonstrate selecting and adjusting a mountain bike, the procedure for a pre-ride and post-ride bike check, and proper mountain bike techniques while providing an opportunity for the cadet to practice each skill under supervision.

Demonstration was chosen for TP 5 as it allows the instructor to explain and demonstrate safety precautions when mountain biking.

A practical activity was chosen for TP 7 as it is an interactive way to introduce the cadet to mountain bike techniques and procedures in a controlled environment during an expedition. The expedition contributes to the development of these skills and procedures in a fun and exciting manner.

INTRODUCTION

REVIEW

N/A.

OBJECTIVES

By the end of this lesson the cadet shall have selected and fitted a mountain bike, followed trail etiquette, obeyed safety regulations and ridden a mountain bike.

IMPORTANCE

It is important for cadets to be able to safely ride a mountain bike for the safety of them and those around them. Safe riding practices are built on knowing the parts of a mountain bike, an ability to properly fit a mountain bike, the development of mountain bike techniques and an awareness of trail etiquette. Having a properly fitted mountain bike will make the riding experience more positive for the cadets, allowing for a more comfortable ride, limiting the possibility and occurrence of injuries and increasing the overall performance of the mountain biker. Demonstrating mountain bike techniques without difficulty will assist the cadets in keeping up with members of their team and completing the practical expedition activity. Following trail etiquette will ensure that all trail users (mountain bikers, hikers, joggers and motorists) are able to use the trails and roads in a safe, enjoyable manner.

Teaching Point 1

Introduce Principles of Safe Riding

Time: 5 min

Method: Interactive Lecture



The following information will be explained to the cadets as a lead-in to the technical skills associated with mountain biking.

Mountain biking is a growing sport in North America. By the 1980s, the popularity of mountain bikes exceeded all other styles of bicycles combined, culminating with its entry into the 1996 Olympic games in Atlanta as a genuine racing event.

The popularity of the sport in the past two decades has led to the development of a trail classification system which informs mountain bikers of the type and technical difficulty of hundreds of trails throughout North America and the rest of the world.

TRAIL RATING SYSTEM

Mountain bike trails are classified by mountain biking organizations. Interest in establishing consistent criteria for the rating of trails has been increasing.

The International Mountain Bicycling Association (IMBA) developed a basic method to categorize the technical difficulty of recreation trails. The system was adapted from the International Trail Marking System used at ski areas throughout the world.

The IMBA Trail Difficulty Rating System has been created to:

- help trail users make informed decisions;
- encourage visitors to use trails that match their skill level;

- manage risk and minimize injuries;
- improve the outdoor experience for a wide variety of visitors; and
- aid in the planning of trails and trail systems.

Mountain bike trails, in accordance with the IMBA Trail Difficulty Rating System have been divided into three categories based on trail width, trail surface, trail grade, obstacles and technical features.

Novice Trails. A novice trail should take two hours or less to complete. Characteristics of a novice trail include:

- hard-packed surfaces,
- some hills which require limited skill to ascend and descend, that are short in duration with few obstacles to navigate around – not too many included in the route,
- no high-speed downhill, and
- mostly flat ground with the inclusion of interesting terrain features such as small roots, logs and rocks to negotiate around.

Intermediate Trails. An intermediate trail can be completed in three to four hours. Characteristics of an intermediate trail include:

- a variety of moderate hills, that require technical skill to ascend and descend with ease,
- some high-speed downhill,
- some difficult obstacles such as roots, logs and rocks are included, but should not be a common feature of the trail, and
- some loose surface.

Experienced Trails. An experienced trail can vary from one to several days in length. Characteristics of an experienced trail include:

- a mix of flat and technical terrain (hills, obstacles and cornering),
- a variety of ascents and descents on steep and uneven terrain,
- a combination of loose and hard-packed surfaces, and
- obstacles such as rocks, roots and logs throughout the route.



It is critical that trail ratings are observed and that the mountain biker pays due diligence by riding on trails that meet their skill and experience level.

SIX CODES OF CONDUCT

With the popularity of mountain biking on the rise, problems between mountain bikers and other trail users is increasing. Conflicts between trail users and mountain bikers have resulted in frequent trail closures in parks and wilderness areas, leaving enthusiasts of the sport seeking alternative locations to ride.

One of the best ways to prevent trail closures and to improve the image of the sport held by non-mountain bikers, is to improve relations with other trail users. To do this, mountain bikers are required to understand and practice trail etiquette whenever they are out on the trail. The IMBA has developed six codes of conduct to minimize the impact of mountain bikers on the environment and on other users, which all mountain bikers are encouraged to adhere to when riding.

Riding on Open Trails Only

Mountain bikers should always respect trail and road closures. Check the status of roads/trails before riding on them. Ensure that permits and authorization are obtained as required. Respect private and public property.

Practicing the Principles of Leave No Trace

Be sensitive to the earth. Even on open trails, care should be taken to ensure that no evidence is left once the trail has been ridden. After a rain or thaw, the ground may be soft and should not be ridden to avoid causing damage. When the trail bed is soft, consider other riding options. Practice low-impact mountain biking by not sliding when riding, staying on the existing trails and not creating new trails. Do not ride through streams and pack out what was brought in.

Controlling Your Bicycle

Inattention may cause an accident. Pay attention to the trail and be aware of approaching mountain bikers and hikers. Excessive speed can hurt the mountain biker and other people on the trail. Obey all speed regulations.

Giving Way to Other Users

Approach other trail users with caution. Let them know well in advance of the approach of a biker. A friendly greeting (or bell) is considerate and works very well. Try not to startle others on the trail by speeding up to or behind them. Show respect when passing others by slowing down or even stopping, depending on the trail width. Anticipate that other trail users may be around corners or in blind spots.

Avoiding Animals

Animals may be startled by an unannounced approach, a sudden movement or a loud noise. This can be dangerous for the mountain biker, other trail users and the animals. Give animals extra room and time to adjust. When passing horses, it is advised that the helmet and sunglasses are removed. Then use care and follow the directions of horseback riders. It is a serious offence to run cattle and disturb wild animals.

Planning Ahead

Know the equipment being used and the ability of the mountain biker and the trail, and prepare accordingly. Be self-sufficient at all times. Wear a helmet, ensure the bike is maintained and carry the necessary supplies for changes in weather and other conditions. A well executed trip will result in a satisfactory experience for the mountain biker.



Respect for other trail enthusiasts and the natural environment is an attitude that all mountain bikers should adopt.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

- Q1. What level of trail are you riding on when it is a mix of flat and technical terrain, made up of both loose and hard-packed surfaces, consists of a variety of ascents and descents on steep and uneven terrain and has obstacles such as rocks, roots and logs throughout the trail to navigate?
- Q2. What measures should you take to practice low-impact mountain biking?
- Q3. What actions should be taken when approaching a horse on the trail?

ANTICIPATED ANSWERS

- A1. An experienced trail.
- A2. Practice low-impact mountain biking by not sliding when riding, staying on the existing trails, not creating new trails, not riding through stream and packing out what was brought in.
- A3. When approaching a horse on the trail it is advised that the helmet and sunglasses should be removed. Use care and follow the directions of horseback riders.

Teaching Point 2**Identify the Parts of a Mountain Bike**

Time: 10 min

Method: Interactive Lecture



This TP is intended to give cadets an overview of the different parts of a mountain bike.

Use a mountain bike as a training aid to point out each as they are discussed. Allow the cadets to have a closer look.



Cadets will have some previous knowledge of the material presented in this TP. Use this knowledge through questions to identify the parts.



To make it easier for the cadets to remember the different parts, present them in a clockwise direction, as illustrated in Figure 16-3-1.

Handlebar. The handlebar is a horizontal bar attached to the bike with handgrips at each end, where brake levers and gear shifters are attached.

Gear Shifter. There are two gear shifters, high and low, located on either side of the handlebars. The front shifter, which works the front derailleur, is normally located on the left side. The rear shifter, which works the rear derailleur, is normally located on the right side.

Brake Lever. There are brake levers on both sides of the handlebar to activate the brakes. The left brake lever is for the front brake, the right is for the rear brake.

Top Tube. The top tube is the horizontal tube running across the top of the bike providing strength and stability to the bike frame.

Tire. The tire is rubber tubing attached to the rim to form a wheel.

Quick Release. There are quick release levers located on both the front and rear wheels. These levers allow for the wheels to be dropped out without the need of a screwdriver or other tool.

Derailleur (Front and Rear). The derailleur is a lever-activated mechanism that pushes the chain off one chainring or sprocket and onto another, altering the gear ratio.



Sprocket is the general term that applies to both chainrings and to cassette cogs. A sprocket is defined as a disc with teeth which drives the chain when the bike is pedalled to propel it forward.

Chainring. A chainring is a toothed ring attached to the crank that drives the chain.

Chainset. The chainset is made up of two or three chainrings that pull the chain around when the pedals are turned.

Chainstay. The chainstay is the lower bar on the bike frame that attaches the rear wheel.

Pedal. The pedal is the platform for the foot to press on, attached to the crank.

Chain. A chain is the circular set of links to transfer power from the chainrings at the front of the bike, to the sprockets in the rear of the bike.

Cogs. A cog is a disc with teeth which drives the chain when the bike is pedalled to propel it forward. Cogs are blocked together to form cassettes which work in conjunction with the rear derailleur.

Cassette. A cassette is comprised of a number of cogs mounted together and attached to the rear hub. The smaller cogs provide a higher (harder) gear for maximum speed, while the larger cogs provide a lower (easier) gear for climbing hills.

Brakes. A bike has two sets of brakes: one set located in the front and the other in the rear. The brakes are activated by the brake levers attached to the handlebars.



There are two different types of braking systems which are used on mountain bikes. The traditional direct-pull (V-Brake) system and the more advanced disc brake system. Some bikes might have a combination of both types, with a disc brake on the front and a direct-pull on the rear.

Seat Tube. The seat tube is a hollow tube which runs from just below the saddle down to the bottom bracket of the bike in which the seat post is inserted into.

Seat Post Release. The seat post release is a quick release lever that holds the seat post in the desired position when it is inside the seat tube.

Seat Post. The seat post is an adjustable support for the saddle which fits into the seat tube.

Saddle. A saddle is the term used to describe the seat of a bike.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

- Q1. If the left brake lever is pulled, which brake—front or rear—would be activated?
- Q2. When climbing up a hill a biker would want to use the gear shifter on which side to move the chain to a smaller cog on the cassette?
- Q3. What are the two different types of brakes found on mountain bikes?

ANTICIPATED ANSWERS

- A1. The front brake.
- A2. The right gear shifter.
- A3. The two types of brakes found on mountain bikes are disc brakes and direct-pull brakes (V-brakes).

Teaching Point 3

Explain, Demonstrate and Have the Cadet Select and Adjust a Mountain Bike

Time: 20 min

Method: Demonstration and Performance



For this skill TP it is recommended that the following format be followed:

1. Introduce cadets to the importance of selecting a proper fitting mountain bike and a proper fitting helmet.
2. Discuss selection of a helmet and then demonstrate how the helmet can be adjusted.
3. Discuss the different methods which can be used to select a mountain bike.
4. Using a bike that has already been properly selected and adjusted, explain the complete procedure for selecting and adjusting a mountain bike.
5. Explain and demonstrate each step required to complete the skill. Monitor cadets as they imitate each step.
6. Once each cadet has selected a mountain bike and helmet, they must be labelled with gear or masking tape.

Note: Assistant instructors may be used to monitor cadet performance.



Since the first introduction of the mountain bike in the mid to late 1970s, the design of bikes has evolved. The quest for improved products has led to continued improvements and advancements in materials being used to construct the bikes, as well as the overall design of the bikes themselves. With the introduction of new bikes each year by front runner manufacturers the use of stronger and lighter new materials and cutting edge designs compete to maximize speed, power and strength.

While it is important to have a well-designed mountain bike, if the bike chosen does not fit the mountain biker then the excellence in design will be lost. Having a properly fitted bike is important for riding efficiency and power as well as safety. When a bike does not fit the mountain biker properly, injuries are more likely.

SELECTING A HELMET

A properly fitted helmet should:

- fit level and square on the head;
- cover the front of the forehead;
- sit snug on the head, without fastening the chin strap;
- not slip when the head moves; and
- have straps adjusted to meet just below the ear and fasten tightly.



INCORRECT



INCORRECT



CORRECT

"Ministry of Transportation Ontario", Cycling Skills: Cycling Safety for Teen and Adult Cyclists, Copyright 2005 by Government of Ontario. Retrieved October 5, 2007, from <http://www.mto.gov.on.ca/English/pubs/cycling/cyclingskills.htm>

Figure 16-3-2 Proper Fit of a Helmet



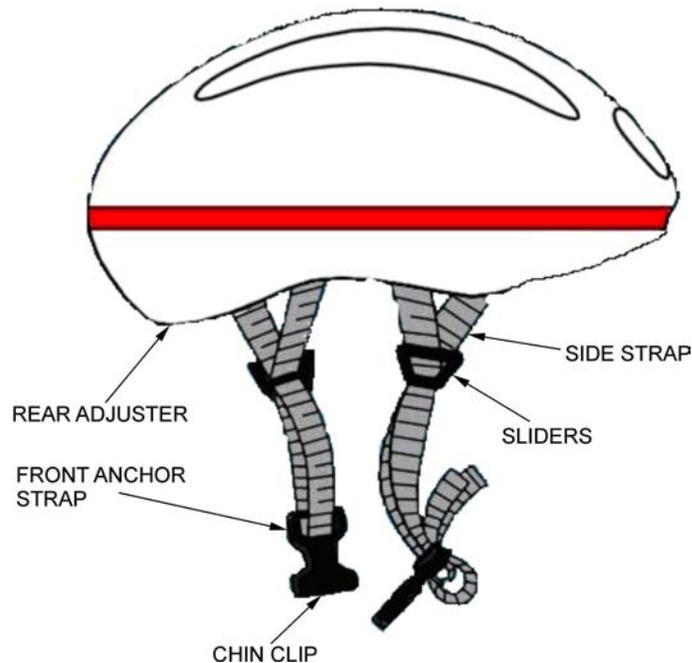
Helmet sizes vary from extra small to extra large and it is important to try on a variety of sizes to make sure the fit is correct.

ADJUSTING THE HELMET

A helmet will not necessarily fit properly without making some minor adjustments. The following are some basic adjustments that can be made to ensure the helmet will protect the mountain biker in an accident:

- Adjust removable pads, if required, to make the fit firm and comfortable.
- Centre the chin clip so it is just under the chin and so the strap is even on both sides. This is done by pulling the strap from one side to another through the underside of the helmet.

- Adjust the side straps by pulling or pushing them through the sliders. The slider should sit just below the ears forming a 'V'.
- Use the rear adjuster (if there is one) by sliding the mechanism to make it bigger or smaller.
- Buckle the chin clip and ensure that no more than two fingers can fit under it.



*"U.S. Consumer Product Safety Commission", CPSC Issues New Safety Standard for Bike Helmets.
Retrieved October 30, 2007, from <http://www.cpsc.gov/cpscpub/prerel/prhtml98/98062.html>*

Figure 16-3-3 Parts of a Helmet

SIZING A MOUNTAIN BIKE

While some manufacturers size their bikes by labelling them as small, medium, large and extra large, in most cases bike size is given in inches and is based on leg length. The size is determined by measuring the distance from where the crank attaches to the bike to the intersection of the seat tube and the top tube.



"Dynamic Bicycles", Bike Sizing Guide, Copyright 2005 from Dynamic Bicycles, Inc. Retrieved October 31, 2007, from <http://www.dynamicbicycles.com/bikes/sizing.php>

Figure 16-3-4 Sizing Measurements

The following steps should be followed when sizing a mountain bike:

1. **Size by Eye.** The initial step in sizing a bike is to select a bike with a frame size that coincides with the height of the mountain biker.
2. **Stand-Over Test.** The next step is to straddle the bike. There should be minimum five-centimetre (two-inch) clearance between the top tube and the crotch when the mountain biker is straddling the mountain bike.
3. **Saddle Adjustment.** Standing next to the bike, the mountain biker will adjust the saddle height to just above their hip by opening the seat post release, raising or lowering the saddle, then closing the release. The mountain biker will then sit on the saddle, place their left foot on the pedal with the ball of the foot over the centre of the pedal. The left leg should be almost perpendicular, without the knee locking.



It is important for cadets to label their bikes and helmets after they have been selected and adjusted. This can be done by using a different colour of gear or masking tape for each team/group. On the bike it is best to wrap the gear tape around the left side of the handlebar and then using a permanent marker place the cadets' initials on the tape. On the helmet, wrapping the tape around one of the side straps on the inside will work. Ensure that the cadets initials are on that as well.

Note: It is best to have assistant instructors help with the labelling.

CONFIRMATION OF TEACHING POINT 3

Selecting and adjusting a helmet and a mountain bike will serve as the confirmation for this TP.

Teaching Point 4**Explain, Demonstrate and Have the Cadet Practice the Procedure for Completing a Pre-Ride Bike Check Using the ABC Quick Check Method**

Time: 10 min

Method: Demonstration and Performance



For this skill, it is recommended that instruction take the following format:

1. Explain and demonstrate a pre-ride check while the cadets observe.
2. Explain and demonstrate each step of the pre-ride check. Monitor the cadets as they practice each step.
3. Monitor the cadets' performance as they practice a complete pre-ride check.

Note: Assistant instructors may be used to monitor the cadets' performance.



When demonstrating the pre-ride check, have the cadets seated away from the bikes to ensure they are paying attention.



The cadets should don their helmets prior to completing any steps of the pre-ride check. This will ensure that no cadet will ride their bike without a helmet.

Mountain biking is incredibly hard on the bikes and equipment. Before the start of a ride it is important to run through a pre-ride check to ensure the mountain bike is in the best possible condition for riding. It may seem redundant to do this before every ride, especially when a post-ride check was completed; however, it only takes one broken cable or one flat tire to ruin a ride.

The ABC Quick Check is an easy way to remember what parts of the bike should be checked during a pre-ride check. The check is a series of questions that the mountain biker must ask themselves, in relation to five areas of the mountain bike. The ABC Quick Check should be practiced so that it can be done quickly and efficiently. The mountain biker will correct any minor issues at the time of the pre-ride check; any major issues, or those that require a bike tool, will have to be brought to the attention of the ride leader for further attention.

AIR

The first step in the ABC Quick Check begins by focusing the mountain bikers' attention on the wheels and tires of the bike.

Do the Tires Have Enough Air?

This can be checked using a bicycle pump that has a built-in tire pressure gauge. The tire pressure for mountain biking should not be below 35 pounds per square inch (psi) (240 kpa) and not above 65 psi (448 kpa).



When pumping the tires, the cadets should aim to ensure that the tire pressure is between 45–50 psi (310 kpa – 345 kpa). This will allow for a variety of trail conditions.



Different trail conditions require different tire pressures. Harder surfaces are easier to ride with harder tires; 50–65 psi (345 kpa – 448 kpa), and conversely, softer surfaces are easier with softer tires; 35–40 psi (240 kpa – 275 kpa).

Is There Any Excessive Wear on the Tread or Any Cuts on the Sidewalls of the Tires?

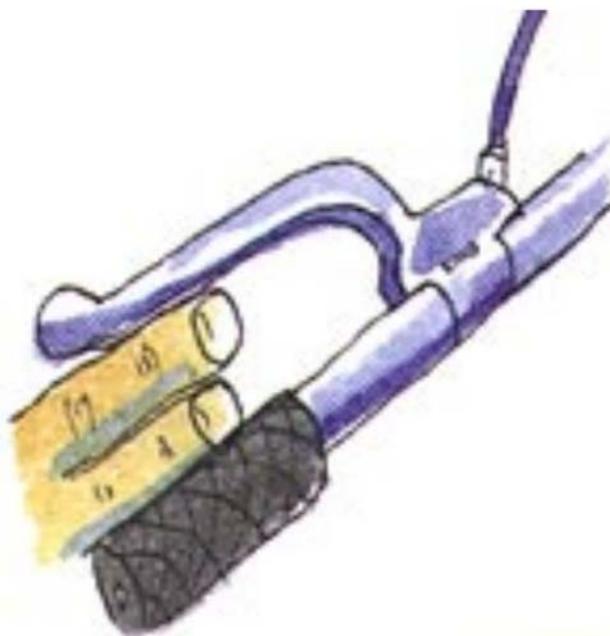
Any loose or engrained mud or debris that is lodged into the tread should be removed. This will help eliminate the possibility of sharp objects working their way through the tire casing into the inner tube, causing a flat.

BRAKES

The mountain biker will now inspect the front and rear brakes of the bike. It is important to spend time on the brake levers, as well as the actual braking mechanism.

Do the Brake Levers Work Effectively?

There should be at least two finger's width of distance between each brake lever and the handlebar when pulled. It should require little effort to engage the brake lever. If it is hard to pull then the brake cables require adjustment.



"Ministry of Transportation Ontario", Young Cyclists Guide, Copyright 2005 by Government of Ontario. Retrieved November 5, 2007, from <http://www.mto.gov.on.ca/English/pubs/cycling/youngcyclists.htm>

Figure 16-3-5 Brake Lever Positioning

Do the Brakes Function as They Are Supposed to?

The front and rear brakes should be checked independently. The mountain biker should stand beside the bike and push it forward by the handlebars. When the front brake lever is pulled, on its own, the rear wheel should lift up as the front wheel locks. When the rear brake lever is pulled, on its own, the rear wheel should lock and slide across the ground.

CHAIN AND CRANK

The chain and crank are what make the bike move forward. If they are not in good working order then the bike will be difficult to manoeuvre and will most likely not get very far.

Is the Chain On and Lubricated?

The chain should be able to move freely around the front and rear sprockets when the pedals are moved with no visible signs of bends or kinks. There should be no evidence of rust on the chain. If there is, an application of lubricant should work out the rust.



"Ministry of Transportation Ontario", Young Cyclists Guide, Copyright 2005 by Government of Ontario. Retrieved November 5, 2007, from <http://www.mto.gov.on.ca/English/pubs/cycling/youngcyclists.htm>

Figure 16-3-6 Lubricating the Chain

Do the Pedals Spin Freely?

The mountain biker should lift up the rear wheel and move the pedals with one hand to check the functionality.

QUICK RELEASE

Quick release levers are located on the front and rear wheels, as well as the seat post.

Are the Wheel Quick Releases Working?

Open and close both the front and rear tire quick release levers. They should be easy to open and close. If not, lubricant can be applied. Ensure that they are fully tightened following the check and that the lever is flush with the fork of the bike.



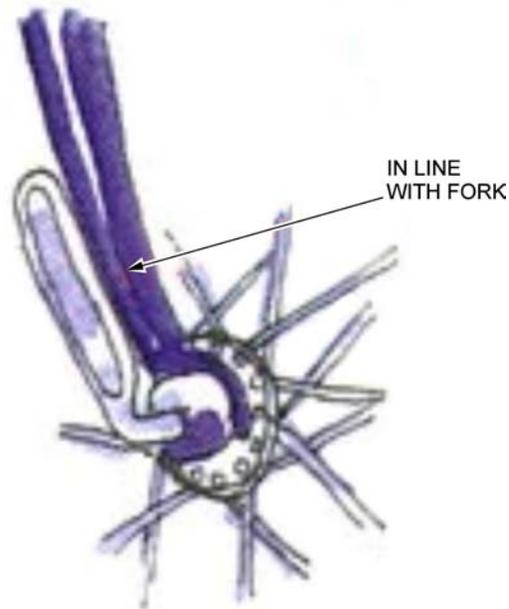
"Ministry of Transportation Ontario", Young Cyclists Guide, Copyright 2005 by Government of Ontario. Retrieved November 5, 2007, from <http://www.mto.gov.on.ca/English/pubs/cycling/youngcyclists.htm>

Figure 16-3-7 Quick Release Incorrect Position – Example 1



"Ministry of Transportation Ontario", Young Cyclists Guide, Copyright 2005 by Government of Ontario. Retrieved November 5, 2007, from <http://www.mto.gov.on.ca/English/pubs/cycling/youngcyclists.htm>

Figure 16-3-8 Quick Release Incorrect Position – Example 2



"Ministry of Transportation Ontario", Young Cyclists Guide, Copyright 2005 by Government of Ontario. Retrieved November 5, 2007, from <http://www.mto.gov.on.ca/English/pubs/cycling/youngcyclists.htm>

Figure 16-3-9 Quick Release Correct Position

Is the Saddle Quick Release Working?

Open and close the lever to ensure that it is in good working order. It should be easy to open and close. If not, lubricant can be applied. When closed the lever should be flush with the seat post, pointing towards the back of the bike.

FINAL CHECK

Finally, the mountain biker should complete a final check of their bike. The bike should be lifted five to seven centimetres (two to three inches) off the ground and then dropped in a controlled manner. When it drops the mountain biker should be listening for sounds associated with loose parts (clings/clangs/pings).

CONFIRMATION OF TEACHING POINT 4

The cadets' participation in completing a pre-ride check of a mountain bike will serve as the confirmation of this TP.

Teaching Point 5**Explain and Demonstrate Safety Precautions Which Must be Adhered to When Mountain Biking**

Time: 10 min

Method: Demonstration



For this TP, it is recommended that instruction take the following format:

1. Discuss the rules of the road.
2. Demonstrate all three (left, right, stop) hand signals while cadets observe.
3. Discuss ride discipline.
4. Demonstrate riding distances and stopping procedures.

Keeping safe on mountain bikes is part common sense and part informed risk-taking, together with a healthy dose of good judgment. Prevention of injury is far easier to deal with than seeking medical attention after the fact. Following basic trail and road safety rules will ensure that the ride is safe, not only for the mountain biker but for all trail users.



Investigate the specific rules and regulations associated with bike safety for your province or territory to pass along to cadets in conjunction with the material presented in this TP.

Each province and territory has specific rules and regulations in relation to bike safety. Bikes are the smallest vehicles on the road which makes it very important for mountain bikers to be as visible as possible to other road users at all times.

RULES OF THE ROAD

Each province has specific rules of the road which form laws within the province. In Ontario, these rules are stated in the *Highway Traffic Act* (HTA).

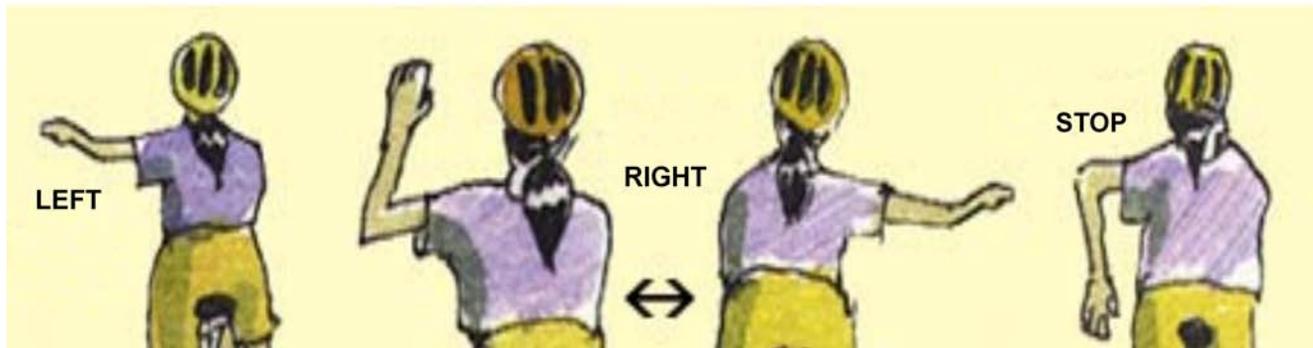
Some important rules that mountain bikers should know are:

- A bike is a vehicle and as a mountain biker, the same rights and responsibilities apply as to other road users.
- Stop at red lights and stop signs, and travel in the designated direction on one-way streets.
- A bike is a slow vehicle and must travel as far to the right as possible, except when preparing for a left turn or passing. Ride out from the curb far enough to maintain a straight-line path.
- Never compromise safety for the convenience of a motorist; use any part of a lane if safety of the mountain biker requires it.
- Stop for pedestrians at crosswalks, and walk the bike across crosswalks.
- Stop for school buses when the upper red lights are flashing and the stop arm is out.
- Stop 2 m (6.5 ft) behind streetcar doors and wait until the passengers have boarded or reached the curb.
- Do not attach a bike to a vehicle to hitch a ride.

- Do not ride on expressways, freeways or on roads where “No Bicycle” signs are posted.
- Mountain bikers must correctly identify themselves when stopped by the police for breaking traffic laws.

SIGNALLING

When riding a bike on the road it is important to ensure that drivers of motor vehicles are aware of the mountain bikers' direction of travel at all times. Making a surprise turn in front of a car is dangerous to both the mountain biker and the driver. Demonstrating proper hand signals will help to eliminate some of the risk associated with riding a bike on roadways.



*“Ministry of Transportation Ontario”, Young Cyclists Guide, Copyright 2005 by Government of Ontario.
Retrieved October 5, 2007, from <http://www.mto.gov.on.ca/English/pubs/cycling/youngcyclists.htm>*

Figure 16-3-10 Hand Signals

RIDE DISCIPLINE

Whether riding a bike on the side streets of town or on a double track in a conservation area, demonstrating awareness for the other mountain bikers will ensure that everyone has a safe ride. Ride discipline is a multi-faceted term that coincides with a variety of aspects of mountain biking, from personal and group organization, to stopping and starting procedures.

Riding in a group is one of the safest ways to ride. It is important to remember that each mountain biker is responsible for the person following them. Always have visual contact with the mountain biker behind. If when looking back the other mountain biker is not visible, stop and wait for a moment. If the mountain biker does not appear in a reasonable amount of time, call a halt to the mountain bikers ahead, and go back and look for the other mountain biker.

There are a few safety tips to keep in mind when travelling in groups:

- Ride in single file on roads and trails as much as possible.
- The lead mountain biker must communicate turns, obstacles and changes in momentum to the remainder of the group through hand signals and voice commands.
- Keep at least 1 m (3.2 ft) between mountain bikers in the group on flat ground.
- When descending hills, keep at least 3 m (9.8 ft) between mountain bikers.
- When ascending hills, stay in single file and keep to the right.
- When stopping, ensure that the entire group is completely off the trail or road.
- When stopped, all group members should get off their bikes, turn bikes so they are facing the road, close in ranks and stand to the left of their bikes.

- If travelling on roads in a large group, break into smaller groups of about 10 with at least 1 km (.62 miles) between each group to allow traffic to pass.
- Road crossings should be completed with the group lining up parallel to the other side of the road and then, in-line, walking their bikes across.

CONFIRMATION OF TEACHING POINT 5

QUESTIONS

- Q1. The rules of the road are found in what document?
- Q2. When making a left hand turn what hand signal should be used?
- Q3. When riding in a group how should you cross a road?

ANTICIPATED ANSWERS

- A1. They are found in provincial regulations.
- A2. The left arm should be extended straight out from the body.
- A3. Road crossings should be completed with the group lining up parallel to the other side of the road and then, in-line, walk their bikes across.

Teaching Point 6

Explain, Demonstrate and Have the Cadet Practice Mountain Bike Techniques

Time: 55 min

Method: Demonstration and Performance



The cadets should be standing beside and to the left of their bikes with their helmets on, in a large semicircle when presented the demonstration portion of each skill.



When the cadets are practicing each individual technique, it is important to set clear and defined boundaries of where they are to ride. It is also important to give specific time limits for each practice phase and a signal for the cadets that tells them to return to the main teaching area and reform the semicircle for further instruction. This could be a whistle blast. Establish signals before the demonstration and ensure cadets know what action is required.



Mountain bike techniques should be presented using the following format:

1. Explain and demonstrate each technique while the cadets observe.
2. Explain and demonstrate the steps for each technique in the following order – mounting, braking, dismounting, gearing, ascending hills and descending hills – while the cadets observe. Ascending and descending hills can be demonstrated concurrently.
3. In a controlled manner, have the cadets practice the steps for all skills. Changes from step to step and technique to technique should be on the command of the instructor.
4. Monitor the cadets as they practice all techniques.

Note: Assistant instructors may be used to monitor the cadets' performance.

MOUNTING

The straddle mount is the most common way to mount a bike. It is always advisable that the bike is in a low, easy gear prior to attempting to mount it.



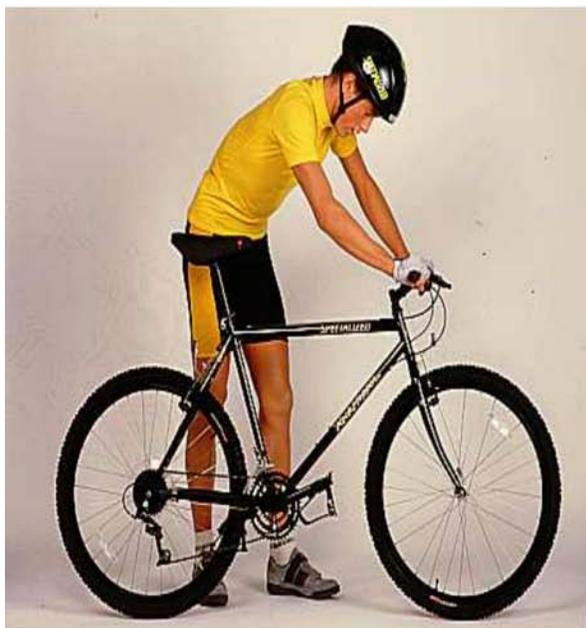
It is recommended that the mountain biker start the mounting procedure with their non-dominant side. If they are right-handed then they should start with the left pedal. If left-handed then they should start with the right pedal.



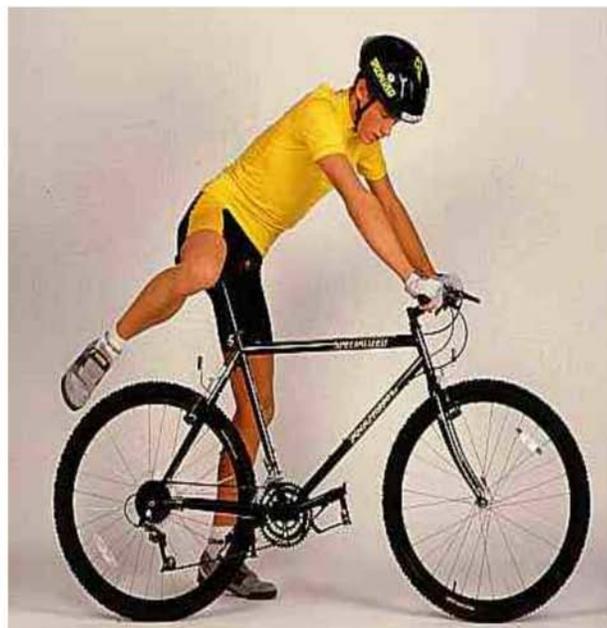
Instructions for the cadets who favour the left leg are in brackets.

The steps for completing a straddle mount are as follows:

1. Stand to one side of the bike with hands firmly on the handlebars.
2. Lift the right (left) leg over the saddle and straddle the bike.
3. Move the right (left) pedal into the three o'clock position.
4. Place the left (right) foot securely on the left pedal and then hop onto the saddle and push forward.
5. Once moving forward, place the right (left) foot onto the right (left) pedal and keep pedalling.



STEP 1



STEP 2



STEP 3-5

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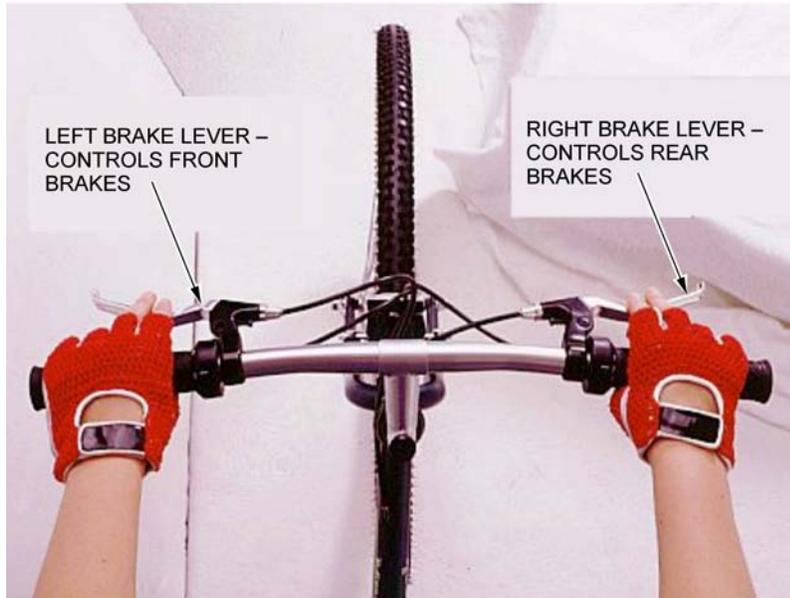
Figure 16-3-11 Straddle Mount a Bike

BRAKING

Braking is used not only for stopping, but for slowing down and controlling the bike through technical portions of the trail. It is important for a mountain biker to be able to judge the amount of pressure to use and when to

brake for various situations while on the roads and trails. This knowledge will ensure personal safety as well as the safety of other mountain bikers and trail users.

The left hand brake lever controls the front brake while the right hand lever controls the rear. Most braking is completed by the right hand, rear brakes, with the left adding assistance as required.



"DK Images", Sports, Games, Recreation, Mountain Biking, Copyright 2007 by DK Limited. Retrieved November 5, 2007, from <http://www.dkimages.com/discover/Home/Sports-Games-Recreation/Outdoor-Adventure/Mountain-Biking/index.html>

Figure 16-3-12 Braking Hand Position

DISMOUNTING

The straddle dismount is the most common and safest dismount.

The steps to complete a straddle dismount are as follows:

1. Prepare to stop by applying the brakes to slow down the bike.
2. While coasting, remain seated in the saddle.
3. Place the left (right) pedal into the six o'clock position.
4. Remove the right (left) foot from the right (left) pedal and place it on the ground slightly to the outside of the pedal.
5. Once the bike has come to a complete stop, slide forward off the saddle and place the left (right) foot onto the ground.
6. Swing the right (left) leg over the back of the bike.



Mountain bikers should be cautioned against using the left brake lever by itself. While this will stop the bike, the forward momentum may cause the mountain biker to continue over the front of the handlebars and bike, resulting in a possible injury.

GEARING

Terrain can change quickly when mountain biking. The ability to time a perfect gear shift is a crucial mountain bike technique to master. Smooth shifting makes the difference between a smooth, easy ride and a rough, hard ride. Gear components are equipped with pre-set gears and ramps built into the chainrings and cogs to help the chain move smoothly from one to another. The mountain biker has to shift to the correct gear at the appropriate time.

Gearing adjusts the pedalling load so the mountain biker can adapt to changes in terrain. A gear is described by the number of teeth on the sprocket that is being used.

Gear Ratio

The gear ratio is the relationship between the front chainring and the rear cassette being used. If the chainring and the cog have the same number of teeth, then the rear wheel would turn once for every pedal stroke and the ratio would be 1 : 1. If the chainring has more teeth than the cog, for example, 34 versus 17, then the ratio would be 2 : 1 and the rear wheel would revolve twice for every pedal stroke. There can also be negative gear ratios where the rear cog has more teeth than the smallest chainring, which makes the rear wheel turn slower than the pedal stroke.



FRONT CHAINSET



REAR CASSETTE

“DK Images”, Sports, Games, Recreation, Mountain Biking, Copyright 2007 by DK Limited. Retrieved November 5, 2007, from <http://www.dkimages.com/discover/Home/Sports-Games-Recreation/Outdoor-Adventure/Mountain-Biking/index.html>

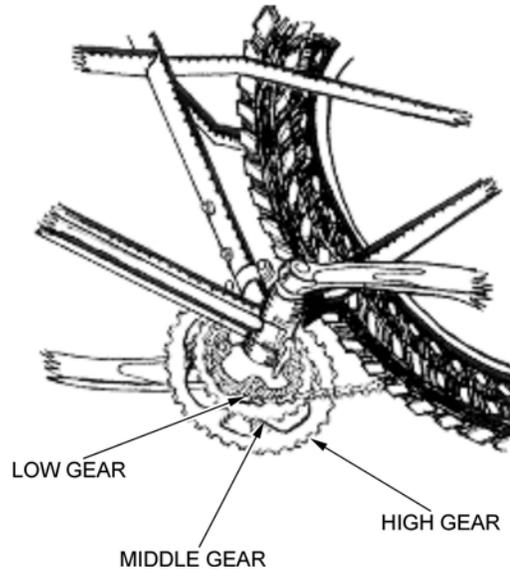
Figure 16-3-13 Front Chainset and Rear Cassette

Typically, mountain bikes have two or three chainrings in the front and seven to nine cogs in the back. Each of these sprockets is attached to a numerical value, which corresponds to the numbers on the gear shifting mechanism attached to the handlebars.

Chainset

The chainset is numbered one through three. The biggest chainring in the chainset – three – is located on the outside of the set while the smallest chainring in the chainset, one, is located on the inside of the set.

The bigger chainring in the chainset is used for flat terrain, high speeds, downhills and road pedalling. The middle chainring in the chainset is for most off-road situations including single track, small hills and bumpy downhills. The smallest chainring in the chainset is used for steep uphill and very difficult technical terrain.

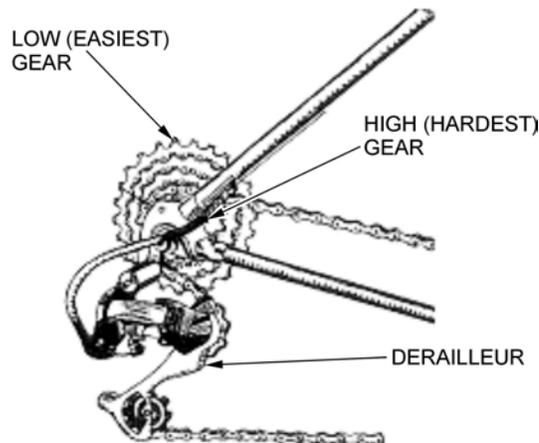


*"Gorp", Your First Mountain Bike Moves: Shifting Gears, Copyright 2007 by Orbitz Away LLC.
Retrieved November 7, 2007, from http://www.gorp.away.com/gorp/publishers/menasha/how_ride5.htm*

Figure 16-3-14 Front Chainset

Cassette

The cassette is numbered one through nine from the inside, closest to the frame, to the outside. The inside cogs, the larger sprockets, equal the low and easiest gears which are primarily used to climb hills and when traversing uneven terrain. The outside, smaller sprockets, equal the highest and hardest gears which are used to gain speed on flat terrain.



*"Gorp", Your First Mountain Bike Moves: Shifting Gears, Copyright 2007 by Orbitz Away LLC.
Retrieved November 7, 2007, from http://www.gorp.away.com/gorp/publishers/menasha/how_ride5.htm*

Figure 16-3-15 Rear Cassette



The bike chain should never be in the big rings on the front and rear at the same time. It places an enormous amount of tension on the chain as it moves the chain from a straight to a diagonal line.

Shifting Gears

As with braking, the left gear shifter controls the chainrings on the front chainset, while the right gear shifter controls the cogs on the rear cassette. When the gear shifter is pushed, the derailleur, front or rear, will move the chain from one sprocket to another.



"2 Wheel Bikes", Suspension Mountain Bikes. Retrieved November 7, 2007, from <http://www.2wheelbikes.com/suspension-mountainbikes/sm3000-mountain-bike.html>

Figure 16-3-16 Right Gear Shifter

All mountain bike gears are indexed which means that they are pre-set and will click into place when the gear lever is activated. Most bikes have a visual indicator on both sides, which shows what gear the bike is in.

Pushing the gear shifter moves the chain onto a bigger chainring or cog, because the movement is against the spring tension in the derailleur. The mountain biker will have to push the lever further than the resting point so that the chain can make it up onto the bigger chainring or cog. This is done with the mountain biker's thumb, because it is stronger than the index finger.

Changing to the smaller chainrings or cogs is an easier motion because the lever is releasing the spring tension, letting the derailleur fall naturally into position. These gear changes are completed using the mountain biker's index finger to pull the lever forward.

It is possible to change more than one gear at a time. This is done through either a series of several clicks or one movement depending on the type of gear shifting mechanism the bike uses.

There are several important points to remember when gearing:

- Gears cannot be changed if the pedals are not moving.
- Cogs are used for small changes in speed, like when the mountain biker is climbing a long steady hill.
- Chainrings are for bigger changes in speed, such as descending the summit of a hill.
- The ideal gear to begin biking is somewhere in the middle of the cassette, four or five, and the middle chainring.

ASCENDING HILLS

Climbing hills is a challenge when mountain biking and the mountain bike has been specifically designed to meet this challenge. Its broad, grippy tires, the position of the mountain biker over the back wheel and the increased number of gears give the mountain bike the technical ability to ascend hills.



A mountain bike can handle inclines close to 45 degrees on badly broken ground.

Being able to ascend a hill is influenced by two factors – power and balance. Balance is gained through awareness and practice, while power is gained through repetition of the skill and muscular and cardiovascular strength.

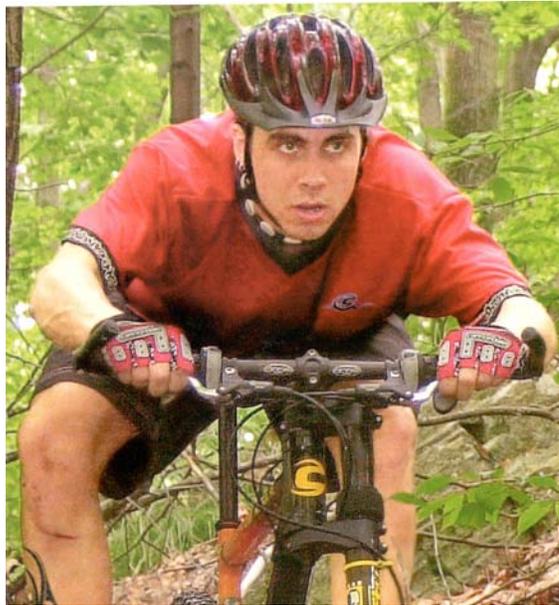
There are factors that affect the mountain bikers' technique while attempting to ascend a hill.

Position

The centre of gravity of a bike and the mountain biker is located at the mountain biker's abdomen. When climbing a hill, the centre of gravity must move forward on the bike to enable the mountain biker to keep their balance. The mountain biker should pull their body weight forward on the bike as the climb gets steeper, otherwise the front tire will not have enough weight on it and will lift up, resulting in a fall.



Centre of gravity is the point where all the weight of an object is concentrated.



T. Brink, The Complete Mountain Bike Book, Ragged Mountain Press (p. 51)

Figure 16-3-17 Proper Ascent Position



While it may seem easier to stand up from the saddle when climbing hills, it in fact requires more power and expends more of the mountain biker's energy. Keeping the body low and forward on the saddle is a much more effective climbing position.

Gearing and Shifting

Depending on the steepness of the hill, it is acceptable to have the front chainset on the middle chainring, index two. The rear cassette is more dependent on the grade of the hill. It is advisable, when approaching

a hill to begin shifting down into a medium intensity gear, perhaps four or five. Once the mountain biker has begun the ascent they will have to continue to lower the cogs in relation to their ability to maintain pedal power. Remember that in order to change gears, the pedals have to be moving and the more steep the incline the harder it will be to pedal.

DESCENDING HILLS

Descending is about letting gravity do the work, while the mountain biker concentrates on braking and distributing weight. It becomes a combination of balance and applying the brakes at the correct time. Mountain bikers must always think ahead and be aware of rough terrain, corners, obstacles and other mountain bikers that may be on the trail. It is critical to apply the brakes to move around or by disturbances, but not too much will completely lose the momentum from the hill.

Position

When descending a hill it is critical that the centre of gravity of the mountain biker does not fall more than halfway down the top tube of the bike. If it does, the mountain biker may go over the handlebars. The mountain biker should move their body weight towards the back of the bike, be as low as possible and extend their arms so they are almost straight in front of them. Depending on the steepness of the hill, the mountain biker may want to slide their bottom off and behind the saddle for further stability.



"2 Wheel Bikes", Suspension Mountain Bikes. Retrieved November 7, 2007, from <http://www.2wheelbikes.com/suspension-mountainbikes/sm3000-mountain-bike.html>

Figure 16-3-18 Proper Descent Position

Gearing and Shifting

Gearing and shifting are not as critical when descending hills as they are in ascending hills. The key thing to remember is that descending hills provides momentum, and speed must be maintained once the hill has ended. To do this, think ahead and shift into gears that will provide the most momentum. The front chainset should be in the biggest chainring and the rear cassette should be in the highest gear, eight. It may be necessary to shift to lower gears once the momentum from the hill begins to slow and pedalling gets harder.



Speed must be controlled when descending hills, with the mountain biker applying equal brake pressure, as required, on both the front and rear brakes. The mountain biker's hands must remain on the brake levers for the duration of the descent and should be ready to break at all times.

CONFIRMATION OF TEACHING POINT 6

The cadets' participation in the practice of each mountain bike technique will serve as the confirmation of this TP.

Teaching Point 7

Have the Cadet Practice Mountain Bike Skills and Techniques During an Expedition

Time: 45 min

Method: Practical Activity

ACTIVITY

OBJECTIVE

The objective of this activity is for the cadets to participate in a practical expedition activity to practice mountain bike skills and techniques in a controlled environment for an extended period of time.

RESOURCES

- Mountain bike equipment, to include:
 - Mountain bike (one per cadet),
 - Helmet (one per cadet),
 - Bell or horn (one per mountain bike),
 - Lights and reflectors,
 - Water carrier (one per cadet),
 - Day pack (one per cadet); and
- Topographical map of area (one per team/group),
- Compass (one per team/group),
- Whistle (one per cadet),
- Communication device (two per team/group),
- GPS Receiver (one per team/group),
- Batteries (spares for communication device and GPS),
- First aid kit (one per team/group), and
- Bike maintenance tool (one per team/group).

ACTIVITY LAYOUT

Designated novice mountain bike trail route.

ACTIVITY INSTRUCTIONS

1. Have the cadets retrieve their bikes and helmets.
2. Have the cadets conduct a pre-ride check for no longer than 10 minutes.
3. Conduct a mountain bike phase of the practical expedition activity, following the designated route to practice:
 - a. mountain bike techniques, to include:
 - (1) mounting;
 - (2) braking;
 - (3) dismounting;
 - (4) gearing;
 - (5) ascending hills; and
 - (6) descending hills; and
 - b. riding formations, and
 - c. communication skills.
4. Upon arrival at the end point, instruct TP 8 and then have the cadets store their bikes and helmets.

SAFETY

- Each group will have a cadet wearing a reflective vest in both the front and back.
- Road- and trail-riding rules must be reviewed with the cadets prior to the commencement of the ride.
- The cadets must travel in single file at all times.
- The cadets must use road hand signals.
- All the cadets must have at least 500 mL (16 oz) of water.

CONFIRMATION OF TEACHING POINT 7

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

Teaching Point 8

Explain and Demonstrate the Procedure for Completing a Post-Ride Bike Check

Time: 5 min

Method: Demonstration and Performance



This TP can be instructed following the biking phase of the practical expedition activity. The instructor should first demonstrate the procedure on their bike and then have the cadets complete a post-ride bike check on their own bike.

Proactive maintenance can reduce the chances of trail side breakdowns. It is the mountain biker's responsibility to ensure the bike is road/trail ready. The initial step in this process is through the implementation of the pre-ride bike check. While the pre-ride check is important, it is just as important to complete a post-ride check.

A post-ride check consists of:

- cleaning; and
- assessing for repairs.

CLEANING

Mountain biking can be a dirty sport. While riding through mud, dirt and water on the trails is part of the experience, if left on the bike long term they can effect the technical components of the mountain bike. Regularly cleaned parts last longer. The following steps should be taken when cleaning the bike:

1. Hose the bike down to get as much mud and dirt off as possible.
2. Turn the bike upside down, wipe down the tires.
3. Using a stiff brush clean all excess dirt and grease off the rear cassette and the front chainset.

ASSESSING FOR REPAIRS

A final quick assessment of the bike should be completed to ensure that nothing requires maintenance before the next time the bike is used. Some key issues to look for include:

- frayed or damaged cables,
- unevenness in the cable and lever system of the brakes; the brake lever should not be able to touch the handlebar,
- cuts in the sidewalls of the tires, and
- wear, cuts and missing knobs on the tires.

CONFIRMATION OF TEACHING POINT 8

The cadets' participation in completing a post-ride check of a mountain bike will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

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

CONCLUSION

HOMEWORK/READING/PRACTICE

N/A.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-703/PG-001, Chapter 3, Annex B, Appendix 7 (326 PC).

CLOSING STATEMENT

Mountain biking is one of three dynamic modes of transport that can be used during expedition training. It is critical that the cadets understand the importance of maintaining a mountain bike and riding it safely. Being able to perform mountain bike techniques will allow the cadets to have an enjoyable and safe experience during the biking phase of the practical expedition activity.

INSTRUCTOR NOTES/REMARKS

Expedition centres are required to select two dynamic modes of travel from EO M326.02a (Paddle a Canoe, Section 2), EO M326.02b (Ride a Mountain Bike), and EO M326.02c (Hike Along a Route, Section 4) to incorporate into their weekend training.

This EO has been allocated five and a half periods in the overall course period allocation. Each expedition centre may adjust this allocation to reflect the choice of activities, facilities and available resources at the expedition centre.

Upon arrival at the expedition centre cadets will be broken into teams/groups. These teams/groups will remain the same for the duration of the weekend.

IAW A-CR-CCP-951/PT-002, the following equipment is required for the familiarization ride:

1. reflective vest (worn by the person in the rear of the group),
2. topographical map of the area (if unfamiliar),
3. compass,
4. first aid kit,
5. communication device (cellular phone or hand-held radio), and
6. basic bike repair kit.

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ROYAL CANADIAN ARMY CADETS

SILVER STAR

INSTRUCTIONAL GUIDE



SECTION 4

EO M326.02C – HIKE ALONG A ROUTE

Total Time:

165 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-703/PG-001, 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.

Ensure every cadet has a water carrier.

PRE-LESSON ASSIGNMENT

Instructors should be aware of and discuss interesting historical sites and geographic features along the route as well as trivia on flora and fauna. This will enhance the experience for the cadet and help create interest. The hike should be treated as a learning experience, not a forced march.

APPROACH

A practical activity was chosen for this lesson as it is an interactive way to allow the cadet to experience hiking on Class 3 terrain in a safe, controlled environment.

INTRODUCTION

REVIEW

N/A.

OBJECTIVES

By the end of this lesson the cadet shall be expected to hike 8–10 km along a route with some Class 3 terrain using the “rest step” principle and employing obstacle crossing techniques as required.

IMPORTANCE

It is important for cadets to be able to hike along a route that contains Class 3 terrain so they will be prepared for the technical challenges if/when given the opportunity to participate in more advanced level expeditions. Hiking is not just about walking along a trail or predetermined route; it requires the individual to be aware of their surroundings, their limitations and the limitations of the group they are travelling with. Knowing what to do when an obstacle is on the route is critical for everyone’s safety. As well, having a basic knowledge and understanding of techniques such as the “rest step” will make the hike more enjoyable for all members.

BACKGROUND KNOWLEDGE



The TPs for this lesson will be presented during hiking familiarization training. Some material may be presented prior to departure, with the remainder being incorporated into teachable moments and breaks throughout the route. Cadets will have been introduced to many of the theoretical concepts, this activity will provide them the opportunity to put into practice what they have already learned.

THE DIFFERENCE BETWEEN HIKING, TREKKING AND BACKPACKING

Hiking is an activity of vigorous walking in the outdoors/wilderness on an unpaved trail, either on a path or navigating along an unmarked route. Usually day hikes consist of travelling cross-country over different terrains, sometimes with inclines and declines. It provides individuals the opportunity to travel to destinations that could not, in many cases, be seen any other way.

The aim of hiking is to learn skills beneficial to physical health. It offers an alternative learning environment and allows participants to explore the outdoor surroundings. For individuals who have never participated in hiking activities, it can be quite challenging. However, it can also offer a challenge to experienced hikers by varying the location/terrain of the hikes.

Trekking is a journey over long distances over several challenging days. Usually trekking involves terrain that requires crossing obstacles.

Hiking becomes backpacking when equipment is carried for an overnight stay.

PERSONAL CLOTHING AND EQUIPMENT FOR HIKING

Clothing

Clothing for the outdoors is slightly different than everyday clothing, yet everyone has clothing at home they can wear outside. When choosing clothing for outdoors, consider clothing that:

- is in good repair,
- breathes: perspiration must be able to escape the body and evaporate (depending on exertion, the body will warm up and become damp, even sweaty),
- is appropriate for the weather conditions and the activity,
- is made of materials that dry easily,
- offers wind and rain protection resistance,
- insulated and padded,
- flexible without drag,
- can be layered as necessary, and
- is comfortable.

Footwear

The most important factor to consider when selecting hiking footwear is fit. The footwear should be sufficiently sturdy to hold together throughout a trip. It should provide protection for the feet, and a firm foundation for

walking and scrambling. Today, boots are derived from athletic shoe technology. They are light, comfortable and functional. Common characteristics to look for when selecting a hiking boot are:

Sturdy. The boot should support feet and ankles from twisting on uneven surfaces. Higher boots with stiff ankle support provide lateral rigidity. The boot should also support the foot from overextending when placing too much weight on the toe or heel.

Lightweight. The lighter the boots the easier walking will be. Every extra pound of footwear weight can be compared to five pounds of added backpack weight.

Comfortable Fit. When worn, boots shall fit snugly with the heel snug against the wall of the shoe and a small amount of space for the toes to move.

Correct Size. Proper fitting boots ensure comfort during hiking. A boot fits correctly when:

- it is wide enough so the boot matches the width of the foot with little extra room,
- the tongue rests comfortably along the top of the toe, and
- the toes have room to wiggle.

Socks

The boot is only part of the footwear system; socks are the first line of defence for the feet. A two-sock system is common in many activities. Unless hiking regularly in hot, damp conditions, consider wearing one pair of heavy socks and one pair of light, inner socks. Always ensure socks are properly sized for the foot.

Inner Socks. This is a thin layer that helps wick, or pull moisture away, from the foot. They are usually made of a polypropylene material.

Outer Socks. This layer is most often made of wool or a wool blend, which can absorb moisture. This layer cushions the foot and provides insulation.

Pack

There are many devices made to assist in carrying loads on a hike. For day trips, use a small pack which can comfortably hold all required items. In the winter, there may be a requirement for extra capacity.

Fanny Pack. The pack for short hikes or treks up to a few hours is a fanny pack. This pack is a small, unobtrusive pack that sits atop the buttocks, with a thin belt that clips around the waist. These are also known as waist, or lumbar, packs. The simplest of these packs consists of a pouch sewn to a piece of flat webbing. More elaborate fanny packs can hold upwards of 10 L, and have padded belts and suspensions. The fanny pack is lightweight, and holds the load close to the spine and a person's centre of balance. Items carried in a fanny pack should be limited to 4.5 kg (10 lbs).



ABC-of-Hiking, 2007, Shop Backpacks, Copyright 2007 by Max Lifestyle.net "Go Hiking Like Max". Retrieved April 19, 2007, from <http://www.abc-of-hiking/shopitems/backpacks/prowler5-backpacks.asp>

Figure 16-4-1 Fanny Pack

Day Pack. Day packs are produced in numerous model types; however, all have shoulder straps and a waist belt. Most day packs have pockets for organizing equipment and basic exterior features (eg, axe loops and daisy chains).

Important qualities of a good day pack include:

- back padding to protect shoulder blades,
- firmly padded shoulder straps,
- adjustment straps for placing weight between shoulders and hips,
- an internal frame (more durable and comfortable to wear),
- padded hip belt; four inches wide around hips and two inches at the buckle, and
- 35–40 L in volume (roughly 9–13 kg [20–30 lbs]).



ABC-of-Hiking, 2007, Shop Backpacks, Copyright 2007 by Max Lifestyle.net "Go Hiking like Max". Retrieved April 17, 2007, from <http://www.abc-of-hiking/shopitems/backpacks/team-backpacks.asp>

Figure 16-4-2 Day Pack

Ten Essential Items

Water Carrier. One indispensable item in any wilderness traveller's kit is a water carrier. Carrying water during a hike requires a lightweight water bottle with a tight lid that is easily refillable. Versatile equipment benefits the user. When choosing a bottle it is advisable to choose one that can withstand the temperatures of frozen or hot liquids.



Wide mouth bottles are a practical choice as many water filters are built to twist directly onto the opening of the bottle. This simplifies the water filtering process.



Hydration bags are an excellent water carrying device which allows the user to easily carry between 1 L and 4 L of water at a time. They are built into a pack and consist of a lightweight plastic bladder and a drinking tube that passes over the shoulder of the user and allows for easy hydration while hiking.



"Mountain Equipment Coop", Copyright 2007 by Mountain Equipment Coop. Retrieved March 28, 2007, from [Shttp://www.mec.ca/Products/product_detail.jsp?PRODUCT%3C%3Eprd_id=845524442500177&FOLDER%3C%3Efolder_id=2534374302696609&bmUID=1177425692300](http://www.mec.ca/Products/product_detail.jsp?PRODUCT%3C%3Eprd_id=845524442500177&FOLDER%3C%3Efolder_id=2534374302696609&bmUID=1177425692300)

Figure 16-4-3 Wide Mouth Water Bottle



"Bionic Sports", Copyright 2007 by Bionic Sports. Retrieved November 16, 2007, from <http://www.bionicsports.com/acatalog/Hydration.html>

Figure 16-4-4 Hydration Bag

Pocket Knife. A knife or multi-purpose tool is essential for repairing equipment and cutting rope, cord or bandages. The key is to find a knife or tool that is small but has all the attachments – blade, scissors, screwdriver – that may be required while out on a hike.

Extra Food. It is always advisable to bring extra food on a hike. Snacks such as granola bars, GORP (good old raisins and peanuts), chocolate bars, and dried fruit will provide the hiker with an energy boost. In an emergency situation they may increase chances of survival.

Extra Clothing. Extra clothing includes an additional layer of warm clothing and a rain coat. A light down vest, sweater, or fleece jacket will provide insulation should the weather be cooler than expected, and during breaks

when sweat evaporates and the body cools. Just because the sun is shining at the start of a hike does not mean it will be shining at the end. Rain coats may also be used in building a shelter in an emergency situation.

Sunscreen. Sunscreen blocks or prevents the skin's exposure to the sun or ultraviolet light. The skin will burn when the amount of exposure to the sun, or ultraviolet light source, exceeds the ability of the body's protective pigment to protect the skin. According to the *Canadian Dermatology Association* a minimum of SPF 15 with UV-A and UV-B protection should be worn.

Sunglasses. Hikers should always wear sunglasses to protect their eyes against damage from the sun's light (eg, ultraviolet, bright or intense light, and blue light). This is especially important in the winter, as snow blindness is a prevalent injury.

Hat. A wide brimmed hat will protect the back of the neck, ears, and face from burning. A toque in the winter will keep the hiker's ears warm and stop the escape of heat from the head.

Insect Repellent. Annoying mosquitoes and black flies can have a negative impact on a hike. Wear loose fitting clothing with closed cuffs and apply insect repellent to ward off unwanted insects. The repellent should be applied to the exposed areas of the body. Many insect repellents rely on chemicals such as DEET to repel insects and have long durations per application.

Headlamp. A headlamp is simply a flashlight that has been attached to an adjustable strap that fits around the user's head. It is beneficial on a hike as it frees up the user's hands to complete tasks when light is low or it is dark.



"Mountain Equipment Coop", Copyright 2007 by Mountain Equipment Coop. Retrieved November 16, 2007, from http://www.mec.ca/Products/product_detail.jsp?PRODUCT%3C%3Eprd_id=845524442621000&FOLDER%3C%3Efolder_id=2534374302697057&bmUID=1195238790425

Figure 16-4-5 Headlamp

Survival Kit. Having a survival kit is a must during any wilderness hiking trip. It should include water purification tablets, a light source, waterproof matches, a signalling device and first aid materials.

Notebook and Pencil. Having a notebook and pencil will allow hikers to keep a log throughout the hike. Collecting information such as route details, trail condition, trail difficulty, and general observations will provide the individual with beneficial material when planning other hikes. It will also provide a record of the experience.

TERRAIN

Terrain is the physical characteristics of the ground, whether it is a flat, straight trail or an ice-peaked mountain. There are different types of terrain that one can expect to encounter on a route.



IAW with A-CR-CCP-951/PT-002, the CCM uses the Yosemite Decimal System (YDS) to rate trail difficulty levels. YDS has a scale from 1–5 and it rates the hardest/most technical section on a terrain/route. It also provides ratings for travel over flat terrain.

Class 1. Hiking, usually on a trail.

Class 2. Simple scrambling, crossing obstacles with the occasional use of hands, requires route-finding skills, may be backcountry dense bush.

Class 3. Angle is steep enough that hands are required for balance; scrambling on rocks using hands and feet, a rope might be carried.

Class 4. Simple climbing, often with exposure requiring a rope belay. A fall could be serious or fatal. Natural protection can usually be easily found.

Class 5. Technical rock climbing begins. Climbing involves the use of ropes, belays, and the placement of natural or artificial protection for the leader in case of a fall. An open-ended decimal extension to Class 5 exists for rating climbs within this category.

Types of Terrain

Easy Terrain. Terrain is flat and footing is secure. Forest roads, trails following streams and rolling hills are generally easy walking.

Moderate Terrain. Terrain with a trail that is mostly solid under foot with either one fairly steep hill or a series of small hills or forest floors with light underbrush.

Difficult Terrain. Any terrain in which a person ascends or descends over 150 m in 1 km. It can also consist of patches of dense forests, thick vegetation and rocky trails/root covered trails.

Rates of travel will differ, depending on the group, equipment, terrain, elevation above ground, etc. Generally:

- On easy terrain with a pack, a group can be expected to travel 3–5 km/h.
- On difficult terrain with a pack, a group can be expected to travel 1.5–3 km/h.
- In difficult terrain, the rate of travel can drop to a third or even a quarter of what it would be on easy terrain.
- When above 3000 m, the rate of travel will greatly decrease. On average, a person will travel 1 km/h less for every 1000 m gained in elevation.
- When descending on easy terrain, the rate can be up to twice the speed of the ascent.

USING TREKKING POLES WHILE HIKING

Types of Poles and Sticks

There are three types of trekking poles – ski poles, wooden walking sticks and telescoping trekking poles. Depending on the activity, the choice of pole will be different.

Trekking poles provide better balance and reduce the amount of stress on the knees, shoulders and back. They absorb some of the impact the body would otherwise absorb. The poles, rather than the body, absorb shock, reduce arm and leg fatigue and improve endurance.

Ski poles and walking sticks may be used for long walks and easy treks on fairly level surfaces. The walking stick may be an acceptable choice for moderate treks. Telescoping trekking poles are the most versatile choice. They work well for hiking and trekking on rough terrain.



*Black Diamond, 2005, Gear, Copyright 2006 by Black Diamond Equipment Ltd.
Retrieved April 12, 2007, from http://www.bdel.com/gear/fixed_length_ski.php*

Figure 16-4-6 Ski Pole



*Wintergoodies.com, 2007, Hiking, Trekking & Walking Pole Adjustable, Copyright 2007 by Wintergoodies.com.
Retrieved April 12, 2007, from http://www.winterbrookgoodies.com/pd_swissgear_hiking_trekking_walking_pole.cfm*

Figure 16-4-7 Telescoping Trekking Pole



The Walking Stick, 2005, Hiking Poles & Walking Sticks & Staffs, Copyright 2005 by The Walking Stick. Retrieved April 12, 2007, from <http://www.backpacking.net/walkstik.html>

Figure 16-4-8 Wooden Walking Stick

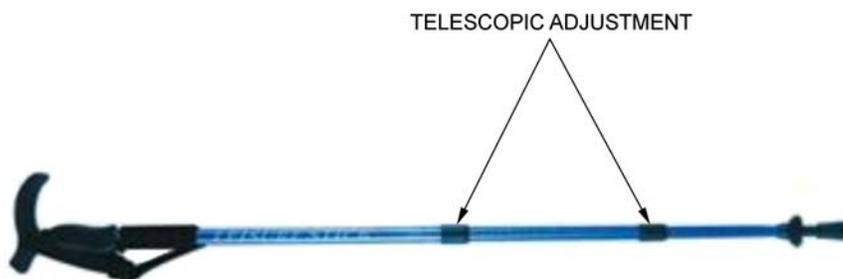
Criteria for Choosing Trekking Poles

To find the right trekking poles or walking stick, one needs to consider the type of activities for which they will be used, the type of terrain and the weight one will carry.



Aluminum telescoping poles are the best option. They are affordable and will last longer.

Telescopic Adjustment. Poles with telescopic adjustment may be adjusted to be longer or shorter depending on the type of terrain. Multiple people can use the same set of poles by adjusting the length. The poles are easy to store when not in use.



Alibaba.com, 2007, Trekking Poles, Copyright 2007 by Alibaba.com Corporation and Licensors. Retrieved April 17, 2007, from http://aoqida.en.alibaba.com/product/50252655/51316862/Trekking_Poles/Trekking_Pole.html

Figure 16-4-9 Telescoping Pole

Grips. Grips that have been shaped to fit the hand are more comfortable to grasp and easier to use over a long period of time. Grips that are hard can get wet with sweat and be uncomfortable to hold. One should try multiple models to find the one that fits the hand the best. An adjustable strap should be attached to the grip to prevent dropping the pole.



Moontrail, Backcountry Equipment Ltd, 2006, MSR Denali II, Telescoping Trekking Poles, Copyright 2006 by Backcountry Equipment, Ltd. Retrieved April 17, 2007, from <http://moontrail.com/msr-denali2.php>

Figure 16-4-10 Grip With Strap

Anti-Shock System (Shock Absorption). The anti-shock system is built into the pole. Some systems are very complex and offer a range of settings depending on the user's preferences and the conditions of the trek. The anti-shock system helps absorb the impact of the pole striking the ground as one walks, easing the strain on the shoulders and arms. A lock system is a must as it allows the user to ensure the settings are locked and will not change during the hike.

Baskets. Baskets are the round rings at the bottom of trekking poles. The basket stops the poles from sinking into the surface (snow, mud or waterlogged ground). There are a variety of baskets. Baskets that are cut out like snowflakes are best used in the snow. Large, solid baskets are best used on soft muddy ground as they prevent sinking. If one is planning to buy trekking poles with baskets, ensure the baskets can easily be changed.



Backcountry Edge, 2004, LEKI Snowflake Baskets, Copyright 2004 by Backcountry Edge, Inc. Retrieved April 17, 2007, from http://www.backcountryedge.com/products/leki/snowflake_baskets.aspx

Figure 16-4-11 Snowflake Baskets



Backcountrygear.com, 2007, Black Diamond Trekking Pole Spare Baskets. Retrieved April 17, 2007, from <http://www.backcountrygear.com/catalog/accessdetail.cfm/BD320>

Figure 16-4-12 Solid Baskets

Tips. There are three types of tips – single point, chiselled and rubber tipped. Each of these tips will work well in a certain environment. The best overall tip is the chiselled. It looks like notches have been cut out of the very tip of the pole, leaving several points sticking out. This type of tip offers traction in almost any condition and is durable.



GoSki-Real Resort Info, 2005, Poles and Trekking Poles, Copyright 2005 by RSN. Retrieved April 17, 2007, from http://www.goski.com/gear/product/LifeLink_Replaceable_Flex_Tip_Pair.html

Figure 16-4-13 Replaceable Tips

METHODS OF USE

Using trekking poles may help prevent aches and pains. Poles are useful to help stabilize heavy loads and to negotiate trails. Besides providing better balance, trekking poles reduce the amount of stress on the back, legs and especially the knees. The poles absorb some of the impact the body would have to endure.



As the explanation is given, demonstrate the different techniques for holding trekking poles.

Trekking Uphill. When walking on even terrain, arms should be parallel to the ground when holding the grip. When trekking uphill, shorten the trekking poles for comfort and stability. This allows one to gain more power.



*TrekkingPoles.com, 2006, How to Use Trekking Poles, Copyright 2006 by NicheRetail, LLC Company.
Retrieved April 26, 2007, from http://www.trekkingpoles.com/custserv/custserv.jsp?pageName=How_To_Use*

Figure 16-4-14 Trekking Uphill

Trekking Downhill. Trekking poles will help reduce the shock of each footfall on the joints when going downhill. For comfort and stability it is recommended that the poles be lengthened.



*TrekkingPoles.com, 2006, How to Use Trekking Poles, Copyright 2006 by NicheRetail, LLC Company.
Retrieved April 26, 2007, from http://www.trekkingpoles.com/custserv/custserv.jsp?pageName=How_To_Use*

Figure 16-4-15 Trekking Downhill

The following may help while descending on rocky terrain:

- Walk slowly and test each rock before placing body weight on it.
- Lean forward to place body weight on the trekking poles.
- Grip the trekking pole securely.
- Keep the arms bent at 90 degrees.
- When possible, move one pole forward and step through with the opposite leg.



Trekking poles can also be used to:

- probe the depth of puddles or the strength of snow bridges;
- ward off aggressive animals; and
- provide support for a camera.



Some people like to have one hand free and only use one pole. For a greater level of support, two is better.

A solid wooden walking stick can be picked up in nature at any time during an expedition.

PERSONAL HIKING RHYTHM

An average day of hiking will consist of periods of hiking and periods of rest. The combination of a good hiking rhythm, a good hiking speed, and fixed rest intervals separate beginners from experienced hikers. Enthusiasm often tends to cause one to start too fast, get tired quickly, take an early rest, and start off too fast again.

Stride Rhythm and Speed

A steady hiking rhythm is generally more enjoyable as one over exerts themselves less and generally keep the physical strain at comfortable levels. Having a steady rhythm will enable a hiker to stick to a fixed schedule and lessen the strain put on the body. This allows a hiker to travel less fatigued.

Developing a Hiking Rhythm. A hiking rhythm is very personal and is developed over the course of many hikes. To develop a rhythm there are some guidelines to follow:

- Choose a specific stride rhythm and speed and keep to it. A good rhythm is one that allows a hiker to hike at the same intensity level for at least one hour without having to take a break.
- Adjust rhythm to terrain, weather and weight. The point where a person can no longer carry on a conversation indicates the hiker has gone beyond a comfortable tempo.
- Make the rhythm a full body movement where breathing and swinging of the arms happen in harmony.
- Uneven surfaces like uphill and downhill slopes of varying incline can make it difficult to maintain a steady hiking rhythm.

Controlling Fatigue

The purpose of resting is to slow down the heart rate and breathing, thereby allowing the heart and lungs to rest. Resting gives the body time to get rid of the lactic acids built up in muscles, and to recover from hot spots or sores.

Resting guidelines:

- Rest in regular intervals; try 10 minutes for every hour hiked (make them part of the rhythm).
- Stick to 10-minute rest breaks. Use only lunch and dinner (supper) breaks as extended rest periods.
- 10 minutes is the most effective rest duration for body recovery.
- Ensure to take off backpacks, rest in the shade, and sit down during rests.
- During the extended rest breaks, allow feet to rest and dry by removing shoes, and airing out footwear.

Adjusting Rhythm

Generally, hiking rhythm on a flat surface can be maintained easily; however, when weather and additional weight are included, hiking becomes more difficult. How fast one travels depends on the fitness level of the entire group, the terrain, the altitude and pack weight. One of the best ways to measure and regulate pace is to pay close attention to the tempo of breathing.

If breathing determines pace then, for example, on level ground one takes three steps per inhalation, and three steps per exhalation. Climbing a hill, while maintaining the same breathing rate, the steps per inhalation fall to two. A good rule of thumb to follow is to walk at a pace where one can still carry on a conversation.

When travelling in different conditions one's pace will change, according to:

- **Weather.** Poor weather will reduce pace and force the hiker to reduce step size for safety.
- **Weight.** Weight will affect pace size as the more weight one carries, the more energy must be expelled.
- **Terrain.** Travelling uphill will reduce pace size and distance travelled.

Full Body Synchronization

Hiking rhythm is a full body affair. Just like marching, hiking requires coordinated movements where every action has a reaction. The swinging of arms provides momentum, breathing controls pace, etc. To properly control rhythm, one must first learn what body parts work in unison. To employ full body synchronization during movement, the arms should be in motion at a natural swing, opposite the forward foot.

Resting Intervals

An average day of hiking consists of periods of hiking and resting. Resting intervals should occur once every hour, for a duration of 10 minutes, in an area that is conveniently shaded and possibly near a water source. During the first five to seven minutes of resting, the body flushes out about 30 percent of the lactic acid buildup in the muscles, but only five percent in the next 15 minutes (be cautious rest does not extend beyond 10 minutes).

In addition to lactic acid buildup in the muscles, the body works in unison and other areas may become fatigued. By resting:

- the heart rate slows and beats at a reduced rate,
- the lungs supply less oxygen to the body,
- the body and mind rest, and
- feet and footwear can be aired out, reducing the chance of blisters.

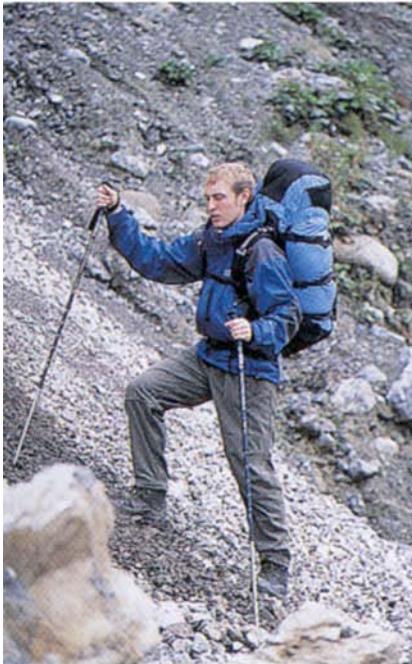
The Rest Step

When trekking, sometimes a hill is so steep that it simply cannot be climbed without taking breaks. In these cases, the rest step can be used. The rest step is also good when hiking in snow and fog.

To employ the rest step:

1. Begin from an upright position. Step forward with the right leg, keeping the weight on the left (back) leg, with the knee locked. Pause before taking the next step, with the weight still on the back leg.
2. Transfer the weight to the right leg. Push up with the right leg and take a step forward with the left leg. Lock the right knee, so that the right leg is bearing all the body weight. Pause before taking the next step, with the weight still on the back leg.

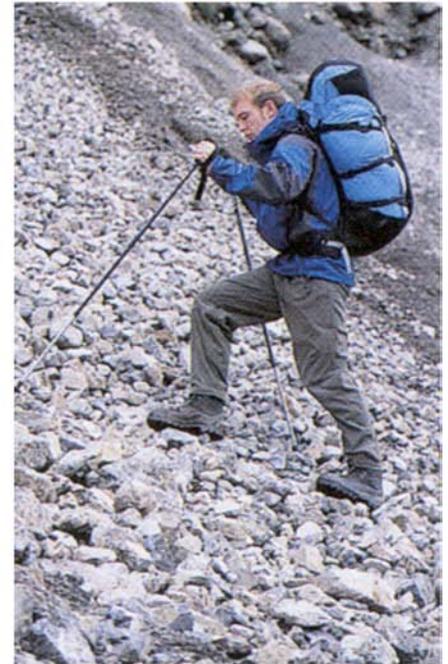
3. Transfer the weight to the left leg. Push up with the left leg and take a step forward with the right leg. Pause before taking the next step, with the weight still on the back leg. Continue moving, walking at a slow and steady pace.



STEP 1



STEP 2



STEP3

K. Berger, Backpacking and Hiking, DK Publishing Inc. (p. 143)

Figure 16-4-16 Rest Step

CLASS 3 TERRAIN HIKING TECHNIQUES

Scrambling

Scrambling is a term used to describe making one's way over rough, uneven terrain and rocks by climbing or crawling. Scrambling usually requires the use of both hands and feet.

The following should be considered when using the scrambling technique:

- Test handholds and footholds before committing body weight.
- Keep the lower body close to the rocks.
- Use the hands to help maintain balance.
- Use large muscles in the legs to support body weight.
- Always maintain three points of contact with the rocks.



*Talisman Newsletter, 2006, Merry Christmas, Copyright 2007 by Talisman Mountaineering Activities Scotland.
Retrieved April 17, 2007, from <http://www.talisman-activities.co.uk/downloads/newsletters/newsletter4/newsletter4.htm>*

Figure 16-4-17 Scrambling Technique



When scrambling and facing difficulty, take a moment to catch your breath. Study your route options and always identify a way back.

Boulder Hopping

Boulder hopping is when one uses speed and momentum to lightly hop from boulder to boulder, using arms or trekking poles to for balance.

The following should be considered when boulder hopping:

- Plan your route. Larger boulders are more stable.
- Use hands for stability.
- Keep knees bent and relaxed.
- Control speed. Lightly hop.
- If one begins to lose balance, move forward, stepping lightly from foot to foot until balance is regained.



Great Outdoor, 2006, Hiking the Forgotten End of the AT, Copyright 2006 by Greatoutdoor.com. Retrieved April 12, 2007, from <http://www.greatoutdoors.com/go/photos.jsp?title=hikingtheforgottenendoftheat&imag=1>

Figure 16-4-18 Boulder Hopping With Trekking Poles

Scree Crossing

A scree is a mass of fine, small rocks that are often found above the tree line on mountain slopes. When dealing with a scree, caution is the first rule.



East Riding of Yorkshire Council, E Riding Media Library-England North, Copyright 2007 by School Improvement Service, East Riding of Yorkshire Council. Retrieved April 17, 2007, from http://www.eriding.net/media/england_north.shtml

Figure 16-4-19 Scree

Traversing a Scree

Traversing means walking obliquely or crossing in a sideways movement.

Walking on a scree may be very slippery. When traversing a scree, a planned zig-zag path is the best option. The route should be broken down in small sections. One should keep the pace controlled and remember that speed can only mean greater risk of injury.

Walking Sideways. Walking sideways will provide more contact between the long side of the foot and the slope to give better stability.

Climbing a Scree

One should avoid climbing a scree, if possible as it can be very exhausting. If there is no other option, the following tips should be considered:

- Keep to the sides of the scree. The movement of the scree is slower and larger boulders can be found there.
- Aim to keep feet horizontal. If the scree is small enough, kick the toes into the slope (like in snow).
- Climbing with the feet spread-eagled will help put weight on the instep of each boot.
- Take small steps to reduce the strain on the legs. This also reduces the chances of slipping.
- Legs should be bent at the knee to support the body.

Descending a Scree

When descending a scree, one should keep the weight on the heels and take short steps. One's back should be straight and the knees should be slightly bent to absorb stress and improve balance.

The following should be considered when descending a scree:

- Dig the heels into the slope.
- Use the hands to stay steady.
- Relax the knees and keep moving.

CROSSING WATER OBSTACLES

Rivers

Crossing rivers can be very challenging depending on the time of the year (eg, spring when snow melts into streams and rivers). A plan should be established before crossing a river.

Choose a Place to Cross. The safest place to cross is where the water is calm and no deeper than the height of one's hips. Such conditions can be found around rivers bends, where the stream widens and slows to make the turn. The darker (and greener) the water, the deeper it is.

The following should be avoided:

- turbulence that causes white water;
- dark water; and
- a powerful current.

If conditions appear dangerous, walk upstream in search of a safer option. Always cross with caution.

Best Time to Cross. Early in the morning is the best time to cross. Rivers run slower in the morning because the water is colder at night.

Wading Across a River. Wading across a river is the safest option. When crossing, always face upstream, diagonal to the current.

If crossing in a group, link arms, with the strongest people at the end. The group should move slowly in a line, diagonal to the current.

Trekking poles can be used to wade across a river. They will help with the balance.



When crossing a river, to keep boots dry, take them off and wear sport sandals. If one does not have sport sandals, remove socks and boot liners, put boots back on and cross the river.

Hopping. Hopping is a technique used with rocks and will help one cross a river and stay dry. The following should be considered when hopping:

- Plan the route. Evaluate the steps to take.
- Decide which rocks are stable.
- Test steps before committing.
- If a step is unstable, move quickly to the next one.

Stepping in the water is an option. It is better to step into the water and get wet feet than to fall into it.

Crossing Rivers Using a Wooden Bridge or Ropes. Wooden bridges range from constructed bridges to logs placed across a stream. Always test a bridge first to see if it is fixed and stable. Crossing a log should be done one person at a time since weight can dislodge the log. If a bridge or a log is too narrow, unstable or high, shuffle across in a sitting position.



Unless trained in river rescue, hand-held rope should not be used. If a rope is fixed in place, it can be used to hold on to. Avoid getting tangled in the rope. Carabiners shall not be used to attach a person to the rope.

Waterlogged Ground

Avoid crossing waterlogged ground if possible. If there is no other way around, one should plan a route through it. Footsteps of previous trekkers can tell how deep and hard the soil is.

Natural Hard Spots. When planning a route, aiming for hard spots in the ground can save time. Trees and shrubs might indicate a solid piece of ground. Large rocks and clumps of hard grass are also good indicators.

Trails. Sometimes, trails go across waterlogged ground. Frequently used trails will often have small wooden pathways (looking like short bridges) built to help facilitate the crossing. Bridges made of fallen logs may also be used.

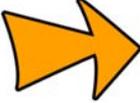


When crossing waterlogged grounds, boots should be tightly laced. Suction of mud may pull at the boots.

Crossing Snow and Ice

Reading the Snow for a Safe Route. When planning a route, it is best to avoid rocky places. Rocks absorb heat causing the snow near them to melt faster. The soft snow may not be firm enough to hold someone's weight. Before using a path, test the snow with trekking poles to prevent injuries. It is best to cross a large snowfield early in the morning when the snow is harder. As the sun rises and becomes more powerful, snow melts unevenly and creates soft spots.

Ascending on Snow. When walking on snow, the conditions will govern the route. A new route may be created to ascend safely. Zig-zags may also be an option. If it is easier to go straight up, one should kick the snow several times to make solid steps to stand on. Before standing on these steps, one should always test body weight.



Trekking uphill through snow can be very exhausting. It is recommended to plan twice as much time to complete this kind of trek. Take breaks as required.

Crossing Ice. Crossing ice requires caution. When crossing ice, one should use trekking poles to probe for holes or test the snow. On ice, do not rely on old footsteps. The route may not be safe if they are a few days old. Always test before advancing.



Ice is thinner in early winter and spring. During these seasons, one should try to go around.

Teaching Point 1

Participate in Hiking Familiarization

Time: 160 min

Method: Practical Activity

ACTIVITY

OBJECTIVE

The objective of this activity is for the cadet to hike along a route that contains some Class 3 terrain, using the "rest step" principle and employing obstacle-crossing techniques as required.

RESOURCES

- Hiking equipment, to include:
 - Hiking boots (one pair per cadet),
 - Day pack (one per cadet),
 - Water carrier (one per cadet), and
 - trekking poles (one pole per cadet);
- Topographical/trail map of the area (two per team/group),
- Compass (one per team/group),
- Whistle (one per cadet),

- Communication device (two per team/group),
- GPS Receiver (one per team/group),
- Batteries (spares for hand-held radio and GPS), and
- First aid kit (one per team/group).

ACTIVITY LAYOUT

Designated hiking route with some Class 3 terrain.

ACTIVITY INSTRUCTIONS



Due to differences in geographic location, resources, and environment it may not be possible to cover all TPs in this lesson while travelling along the predetermined hiking route. It is suggested that a review of theoretical concepts takes place prior to departing. This should be completed as a discussion with the cadets, using leading questions to aid in the identification of the key concepts. During the hike, re-establish these points through practical examples, such as pointing out when the cadets are travelling on easy terrain versus moderate terrain. The TPs are organized into two main headings – pre-departure and during—but it should be understood that concepts discussed in the pre-departure section will be revisited during the hike.

1. Conduct pre-departure training, reviewing the following concepts through discussion:
 - a. the difference between hiking, trekking and backpacking,
 - b. personal clothing and equipment for hiking,
 - c. terrain, including:
 - (1) the Yosemite Decimal System (YDS), and
 - (2) types of terrain, including:
 - a. easy,
 - b. moderate, and
 - c. difficult; and
 - d. trekking poles, including:
 - (1) types of poles and sticks, and
 - (2) criteria for choosing trekking poles.
2. Conduct a pre-hike briefing, to include:
 - a. clothing/equipment requirements,
 - b. trail etiquette,
 - c. daily water requirements,
 - d. rest intervals, and
 - e. route overview.

3. Assign cadets the following positions and provide them with required equipment (positions will change throughout the route):
 - a. navigator (topographical/trail map of area, compass),
 - b. first-aider (first aid kit), and
 - c. radio operator (hand-held radio, spare batteries).
4. Have cadets retrieve their day packs and trekking poles and prepare to move.
5. Depart on the predetermined hiking familiarization route, incorporating the remaining TPs, where applicable, into teachable moments and breaks throughout the route, to include:
 - a. methods of using trekking poles while hiking;
 - b. personal hiking rhythm, including:
 - (1) stride rhythm and speed,
 - (2) controlling fatigue,
 - (3) adjusting rhythm,
 - (4) full body synchronization,
 - (5) resting intervals, and
 - (6) the rest step;
 - c. Class 3 terrain hiking techniques, including:
 - (1) scrambling;
 - (2) boulder hopping; and
 - (3) scree crossing, to include:
 - a. traversing a scree,
 - b. climbing a scree, and
 - c. descending a scree; and
 - d. crossing water obstacles, including:
 - (1) rivers,
 - (2) waterlogged ground, and
 - (3) snow and ice.
6. Upon arrival at the end point, debrief the cadets and have them return equipment.

SAFETY

- The cadets will respect the predetermined boundaries for this activity.
- Teams/groups will travel in single file.
- Teams/groups will not pass another teams/groups unless directed to do so by their team instructor.

- All the cadets must have at least 500 mL (16 oz) of water.
- A water supply will be available along the route.

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 practical expedition activity will serve as the confirmation of this lesson.

CONCLUSION

HOMework/READING/PRACTICE

N/A.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-703/PG-001, Chapter 3, Annex B, Appendix 7 (326 PC).

CLOSING STATEMENT

Hiking is one of three dynamic modes of transport that can be used during expedition training. It is critical that the cadets are given the opportunity to hike on routes which include some Class 3 terrain to prepare them for more advanced expedition experiences. Being aware of pacing and implementing the "rest step" while hiking will ensure a more enjoyable hiking experience for the individual and the team/group. When travelling on advanced hiking terrain, the possibility of encountering obstacles is quite great, therefore it is important that all members understand how to safely cross them.

INSTRUCTOR NOTES/REMARKS

Expedition centres are required to select two dynamic modes of travel from EO M326.02a (Paddle a Canoe, Section 2), EO M326.02b (Ride a Mountain Bike, Section 3), and EO M326.02c (Hike Along a Route) to incorporate into their weekend training.

This EO has been allocated six periods in the overall course period allocation. Each expedition centre may adjust this allocation to reflect the choice of activities, facilities and available resources at the expedition centre.

Timings for this EO will vary. While there is a requirement for some initial training, the focus should be on having the cadets practice hiking techniques through practical application.

Upon arrival at the expedition centre cadets will be broken into teams/groups. These teams/groups will remain the same for the duration of the weekend.

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ROYAL CANADIAN ARMY CADETS

SILVER STAR

INSTRUCTIONAL GUIDE



SECTION 5

EO M326.03 – PRACTICE ENVIRONMENTAL STEWARDSHIP AS A TEAM LEADER

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-703/PG-001, 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

N/A.

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 Leave No Trace principles. A group discussion also helps the cadets improve their listening skills and develop as members of a team.

An interactive lecture was chosen for TPs 2 and 3 to give an introduction and overview of current land management issues in Canada and generate interest in adhering to Leave No Trace principles.

INTRODUCTION

REVIEW

N/A

OBJECTIVES

By the end of this lesson the cadet shall be expected to practice environmental stewardship as a team leader.

IMPORTANCE

It is important for cadets to understand environmental stewardship as it relates to ecological sustainability and Leave No Trace camping. Environmental management is constantly changing and knowing what is acceptable will assist the cadet in making good leadership decisions.

Teaching Point 1**Review the Principles of Leave No Trace Camping**

Time: 5 min

Method: Group Discussion

BACKGROUND KNOWLEDGE

The point of the group discussion is to draw the principles of Leave No Trace camping from the group using the tips for answering/facilitating discussion and the suggested questions provided.

PRINCIPLES OF LEAVE NO TRACE CAMPING**Plan Ahead and Prepare**

Plan ahead by considering your goals and expectations. Taking steps in advance of the trip will allow for minimum impact on the trail. Some points to help prepare include:

- **Knowing the Regulations and Special Concerns for the Areas Visited.** Taking the time to research specific locations will aid the group in packing and preparation.
- **Preparing for Extreme Weather, Hazards and Emergencies.** Information concerning weather, possible hazards, and emergencies should never be assumed or the importance underestimated. Check with weather forecasting services and research the location's seasonal weather history for any clues to weather that may be expected. Always plan for the worst weather expected, and be prepared for any emergency.
- **Carefully Planning Meals and Repackaging Food to Minimize Waste.** Reducing the amount of food you carry by carefully planning meals and repackaging food, reduces the amount of garbage produced. Eliminating trash removes the possibility of accidentally leaving waste behind.

Camp and Travel on Durable Surfaces

Trampled vegetation and eroded trails last for years, or even a lifetime. Walk and set tents on surfaces that endure (eg, rock, sand, gravel, dry grasses and snow). Adhere to the following guidelines:

- **Concentrate the Trek on Existing Trails and Campsites.** In popular areas, focus the trek where it is obvious that other visitors have already left an impact. Travelling on areas already worn will reduce the overall impact on the environment in the long term.
- **Walk in Single File in the Middle of the Trail, Even When Wet or Muddy.** Trails travelled frequently will show signs of wear. Maintaining travel in the centre of the path will reduce wear spreading to the edges of the trail.
- **Avoid Taking Shortcuts Away From Established Trails.** Taking shortcuts around routes or obstacles may be time saving however, the effect on the vegetation and environment is damaging. Avoid this whenever possible.
- **Travel on Rock, Gravel, Dry Grasses or Snow.** These surfaces are durable and can withstand the pressure of human travel. In pristine areas with no noticeable impact, groups should not walk in single file, but should disperse and travel separate routes.
- **Camp 100 m (300 Feet) From Lakes and Streams.** Ground water and water from lakes and streams have the potential to be spoiled by increased human contact. By camping a minimum distance of 100 m (300 feet) from these water sources, cadets can do their part to limit the impact on the area's ecosystem.

Dispose of Waste Properly

Pack it In, Pack it Out. Inspect the campsite and rest areas for trash or spilled foods. Pack out all trash, leftover food and litter.

Disposing of Human Waste. Dispose of all human waste in catholes dug 16–20 cm (6–8 inches) deep and at least 60 m (200 feet) from water sources, camps, and trails. Cover and disguise the cathole when finished. Be sure to follow any additional direction provided by the owner or manager of the area you are training in, and adhere to any regional directives that may be in place.

Pack Out Toilet Paper and Hygiene Projects. Soiled toilet paper and feminine products will take a considerable amount of time to decompose, especially if the trek involves many participants. Be sure to employ a suitable disposal plan.

Washing the Body or Dishes. Carry water 60 m (200 feet) away from streams or lakes and use small amounts of biodegradable soap. Scatter strained dishwater.

Leave What You Find

While trekking there will be many wonderful structures, intriguing objects, and items one will find interesting. Items of such nature shall be left alone for others to cherish.

Some guidelines to follow include:

- **Preserving the Past.** Leave all cultural or historical structures and artifacts untouched for all to enjoy.
- **Leave Flora and Fauna.** Plants, rocks, and animals shall be left alone and undisturbed.
- **Avoid the Construction of Structures.** While in the field, common practice is to invent or construct structures and furniture or dig trenches to make living easier, however, these actions leave a noticeable, unnatural indication of human presence in the environment. If structures are created out of necessity, once finished return the environment to its original appearance.

Minimize Campfire Impacts

Traditional open fires destroy the landscape, and can be avoided by using lightweight stoves. If fires are acceptable, build minimum impact fires using an existing fire ring, pan or fire mound. Only dead and downed wood, no bigger than an adult's wrist, should be used. Maintain a small fire by burning all the wood down to ash then, saturating the ash with water and scattering the ash broadly. There should be little to no evidence of a fire.

Respect Wildlife

Animals in their natural environment are not used to humans. Although some wild animals adapt to human presence, others flee, sometimes abandoning their young and their preferred habitat. As guests in the environment, and as expeditionists, we need to respect wildlife by observing these simple guidelines:

- Observe wildlife from a distance.
- Never feed the animals.
- Protect wildlife and food by storing rations and trash securely.
- Control pets.
- Avoid wildlife during sensitive times (eg, mating, nesting, when raising young, or during the winter).

Be Considerate of Other Visitors

While trekking, one will likely encounter other travellers. Be sure to respect others and afford common courtesies, such as:

- respecting visitors to protect the quality of their experience;
- yielding to others on the trail;
- camping away from trails and other visitors; and
- allowing nature's sounds to prevail.

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 the seven principles of Leave No Trace camping?
- Q2. When in the wilderness, squirrels are often present around the campsite. How much food should you spare to feed the animals?
- Q3. When preparing for a trek, what should one check to determine what clothing will be required for the trip?
- Q4. Where should campfires be made?
- Q5. What action should be taken with respect to other campers?



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 cadet's participation in the group discussion will serve as the confirmation of this TP.

Teaching Point 2

Discuss Land Management Issues in Canada

Time: 5 min

Method: Interactive Lecture



This TP is designed to give cadets an introduction to land management issues in Canada that can affect expeditions. In addition, this information will allow cadets to be knowledgeable about current environmental issues.

SUSTAINABLE FORESTRY

Sustainable forestry is meeting society's increasing demands for forest products while respecting the values of society and preserving forest health.

Forests in Canada are almost 15 000 years old, but, without sustainable forestry they may not be around for another 15 000 years. Over the last decade, forest concerns have been raised by public interest groups, Aboriginal peoples, and concerned citizens. Concerns include clear cutting, using pesticides and managing the forest for wildlife, cultural values, recreation and park management, and fresh water.

Why is it Important for Canada to Have Sustainable Forestry Standards?

Ensuring the sustainability of the resource and the long term protection of forest ecosystems and maintaining employment in the forestry sector are all critical to Canada's competition in international markets. The forestry industry is Canada's largest industrial employer, with over 339 900 Canadians directly employed in the industry.

Sustainable forests are a source of well-being socially, environmentally and economically. Canada is home to approximately 30 percent of the world's boreal forest. There are 180 indigenous species of trees in our forests that provide habitat for 70 species of mammals and 300 species of birds.

Within the 30 percent, 294.8 million hectares are available for commercial use. 143.7 million hectares of commercially available forest are actively managed. Most of Canada's forests are publicly owned (93 percent) of which 77 percent are under provincial jurisdiction.

It is important to note that before any forestry take place, a forest management plan must be prepared.

Forest Management Plan. A plan developed by industry leaders, professional foresters and local citizens that follows the Forest Management Planning Manual. The plan includes determining available harvest areas and assessing criteria and indicators of sustainability.

Forestry companies manage crown forests under licences that are known as sustainable forest licences (SFLs). SFLs are valid for 20 years but must be renewed every five years to show compliance to regulations as well as public audit. If a company does not meet the standard, the licence is not renewed.

Stumpage fees are charges to companies for the right to harvest timber. Stumpage fees are based on the number of trees harvested.

Canada is committed to and is a world leader in sustainable forest management. As of 2006, Canada had the largest number of independently certified forests.

Independently Certified Forests. Forests that have been certified by an independent third party to be managed using sustainable methods.

WASTE MANAGEMENT

Waste management has changed drastically with recycling becoming a large part of waste reduction. Waste management is the responsibility of all levels of government. Provincial governments are responsible for licensing hazardous waste generators, carriers and treatment facilities.

Most waste management is contracted to private companies.

In field and wilderness settings, waste management is conducted by area residents, park staff or a private management company.

Carrying out what was carried in is crucial to waste management in wilderness areas. Bringing garbage back home, or back to the training centre where adequate disposal measures are in place assists in keeping wilderness areas clean.

WATER CONSERVATION

Nearly three quarters of the earth is water. Ninety-nine point six percent of all fresh water is frozen in glaciers and ice fields, or located deep underground. Within our land mass, Canada holds about seven percent of the world's renewable fresh water.

	Canada holds 20 percent of the world's fresh water, but only seven percent is renewable.
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Canadians rely on this seven percent of fresh water for drinking water, agriculture, recreation, industry and ecosystems. Managing this vast resource is the responsibility of all levels of government. Water conservation and management is an important issue within Canada that many people take for granted.

Why is Water Conservation so Important?

Although Canada has the largest supply of fresh water, it is diminishing. Demand for water is higher, pollution has increased within water supplies, water tables have declined, and prolonged warm weather has caused drought conditions more frequently. These factors are shrinking the usable water supply.

Water is used for cooking food, bathing, doing laundry and drinking. When we are done with the water, it is usually returned to the same body of water it came from, usually in a worse condition.

What Do we Mean by Water Conservation?

Water conservation means wasting less water, using water more efficiently, and not misusing water.

Using Water in the Wilderness

When in the wilderness, collecting water from rivers, streams and lakes should be done with care.

Bathing in lakes will contaminate water. Using soap when washing is especially detrimental to the water as chemicals and bacteria not found naturally are being added. Even soaps that claim to be biodegradable are harmful to the water.



One drop of oil can render up to 25 L of water unfit for drinking.

The increase in Canada's population leads to an increased demand for water. More chemicals and bacteriological pollutants are found in the water supply. Waterborne diseases found in municipal water have prompted awareness and action by organizations across the country. This, combined with a depleting water table, means that maintaining a stable clean water supply has never been more important.



Only about one percent of the water in the Great Lakes is renewed each year through rainfall and snowmelt.



The entire population of Prince Edward Island and over 60 percent of the population of New Brunswick and the Yukon rely on groundwater to meet their domestic needs.

ECOSYSTEM MANAGEMENT



Ecosystem. A self-regulating association of living plants, animals, and their non-living physical and chemical environment.

The sphere of life and organic activity extends from the ocean floor to approximately 8 km (5 miles) into the atmosphere. Within this sphere are thousands of different ecosystems. In an ecosystem, a change in one component causes changes in others as all systems adjust to the new conditions. An ecosystem includes biotic (living) and abiotic (nonliving) components. All of the components function as a whole, therefore, the slightest change in an ecosystem can drastically change its health.

Limiting factor. Physical or chemical factor that inhibits (through a lack of, or an excess of) biotic processes.

Changes that can threaten the biodiversity of areas are:

- habitat loss and degradation,
- invasive alien species,
- pollution, and
- climate change.

The national Species at Risk Act was adopted in 2002, to work with existing laws to protect wildlife species and protect ecosystems. Designed to ensure action plans are prepared for the recovery of declining species, the Act applies to all federal lands. Most provinces also have Species at Risk legislation.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

- Q1. What does water conservation mean?
- Q2. Why is ecosystem management so important?
- Q3. What can threaten the biodiversity of an area?

ANTICIPATED ANSWERS

- A1. Water conservation means wasting less water, using water more efficiently, and not misusing water.
- A2. Ecosystem management is so important because a change in one component causes changes in others as all systems adjust to the new conditions.
- A3. Threats to the biodiversity of an area are:
- habitat loss and degradation,
 - invasive alien species,
 - pollution, and
 - climate change.

Teaching Point 3

Identify Ways a Team Leader Can Implement Leave No Trace Principles

Time: 10 min

Method: Interactive Lecture



This TP is designed to motivate cadets to follow Leave No Trace principles.

Allow cadets to develop their own ideas and implement them on corps trips and exercises.

LEAVE NO TRACE PRINCIPLES

Following Leave No Trace Principles Personally by Leading by Example

Cadets follow and do as their leaders do. Cadets watch everything and notice when leaders are doing things differently. Seeing their leaders following Leave No Trace principles allows other cadets to see the principles in action. Seeing the leader of the group apply the principles will cause the junior cadets to follow.

Designate a Leave No Trace Leader Within the Group

Before heading out on the hike, trip or expedition, designate a cadet as a Leave No Trace leader. The Leave No Trace leader ensures the group follows Leave No Trace principles throughout the activity.

Make the job fun! A button or badge can be attached to the person's pack to identify them.

Becoming a Leave No Trace Advocate

Being an advocate of Leave No Trace principles means following Leave No Trace at home and school as well. Use less water, take public transportation, walk to school, recycle, and compost.

Even those who do not enter the wilderness affect the places others enjoy by actions such as depleting the water table, contributing to air pollution, and living in large homes that need more heat than smaller ones.

Implementing Awards Systems for Those who Follow Leave No Trace principles

Trail snacks, or treats as well as certificates (or even larger prizes) can be awarded to the cadets that follow Leave No Trace principles, or encourage others to follow the principles.

Sharing Leave No Trace Information With Others

Tell Stories, Don't Preach. Lectures will invariably make the group lose focus. Do not lecture the group about littering or nag them when hiking. Make the point in a story about an experience, or a fictional tale. A story about a mother bear and her cubs living off garbage versus hunting for dinner will have more impact than lecturing the cadets.

Teachable Moments. Pointing out trail erosion or polluted water sources is better than teaching theoretically. Teach when opportunities present themselves.

Show a Better Way. Rather than telling cadets they are doing something wrong, show them the better way.

Authority of the Resource. Switch the authority from the platoon commander to the earth. Encourage people to change their behaviour based on their desire to help the environment rather than on a need to obey an authority figure.

ACTIVITY

Time: 5 min

OBJECTIVE

The objective of this activity is get the cadets to brainstorm implementing Leave No Trace principles.

RESOURCES

N/A.

ACTIVITY LAYOUT

N/A.

ACTIVITY INSTRUCTIONS

1. Divide the cadets into two or three small groups.
2. Have the cadets brainstorm implementation of the principles listed in TP 1.
3. Have the cadets share their ideas with the entire group.

SAFETY

N/A.

CONFIRMATION OF TEACHING POINT 3

The cadets participation in the brainstorming session about implementing Leave No Trace principles will serve as the confirmation of this TP.

END OF LESSON CONFIRMATION

QUESTIONS

- Q1. Describe the second principle of Leave No Trace, camp and travel on durable surfaces.
- Q2. What is sustainable forestry?
- Q3. What does being a Leave No Trace advocate mean?

ANTICIPATED ANSWERS

- A1. Trampled vegetation and eroded trails last for years, or even a lifetime. Walk and set tents on surfaces that endure (eg, rock, sand, gravel, dry grasses and snow).
- A2. Sustainable forestry is meeting society's increasing demands for forest products while respecting the values of society and preserving forest health.
- A3. Being a Leave No Trace advocate means following Leave No Trace principles at home and school as well. Use less water, take public transportation, walk to school, recycle, and compost.

CONCLUSION

HOMEWORK/READING/PRACTICE

N/A.

METHOD OF EVALUATION

N/A.

CLOSING STATEMENT

Understanding environmental stewardship and its practices will guide team leaders when in the wilderness to make proper stewardship decisions.

INSTRUCTOR NOTES/REMARKS

This EO could be delivered by a local official or Ministry of Natural Resources representative.

If being delivered by a guest speaker, this EO may be tailored to the local area; however the human impact theme must remain. The guest speaker should present issues specific to area land management.

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ROYAL CANADIAN ARMY CADETS

SILVER STAR

INSTRUCTIONAL GUIDE



SECTION 6

EO M326.04 – NAVIGATE ALONG A ROUTE USING A MAP AND COMPASS

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-703/PG-001, 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

N/A.

APPROACH

An interactive lecture was chosen for TP 1 to review navigation background material.

A practical activity was chosen for TP 2 as it is an interactive way to allow the cadet to experience navigation in a safe, controlled environment. This activity contributes to the development of navigation knowledge and skills in a fun and challenging setting.

INTRODUCTION

REVIEW

N/A.

OBJECTIVES

By the end of this lesson the cadet shall have navigated along a route using a map and compass.

IMPORTANCE

It is important for cadets to understand how to navigate along a route as it provides a foundation for building subsequent navigation skills. Navigation is an important aspect of expedition training. All cadets should take every opportunity to practice and refine these skills.

Teaching Point 1**IAW PO 222 (Navigate Along a Route Using a Map and Compass, A-CR-CCP-702/PF-001, Chapter 12), Review Navigation**

Time: 10 min

Method: Interactive Lecture

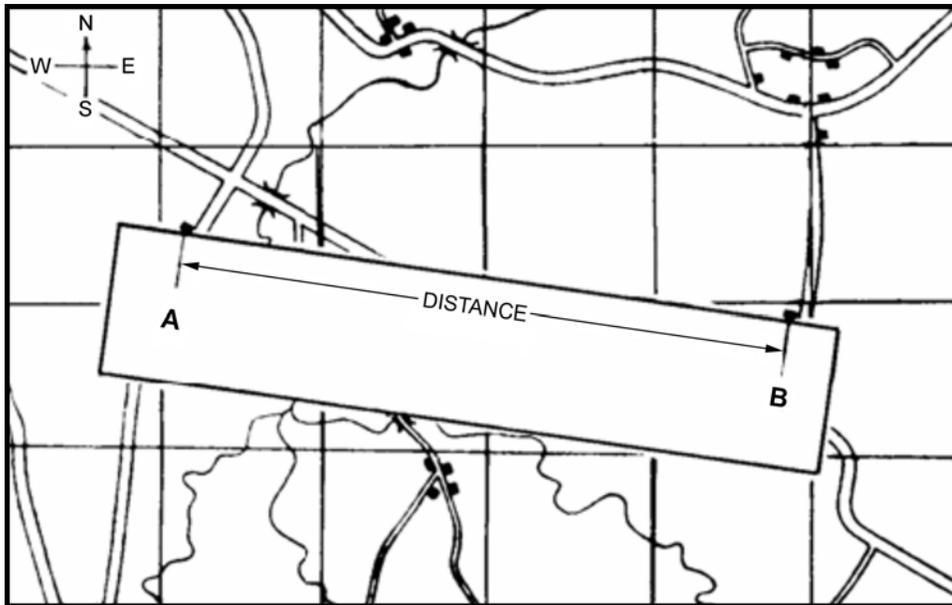
DETERMINING DISTANCE ON A MAP

Cadets can use their maps to measure the distance between two points (A and B) on the ground. All maps are drawn to scale; therefore, a specified distance on a map equals a specified distance on the ground. The scale of a map is printed at the top and bottom of each map (eg, scale 1 : 50 000). This means that 1 cm on the map equals 50 000 cm (500 m) on the ground. There are two ways to determine distance on a topographical map – point-to-point and along a route.

Measuring Point-to-Point

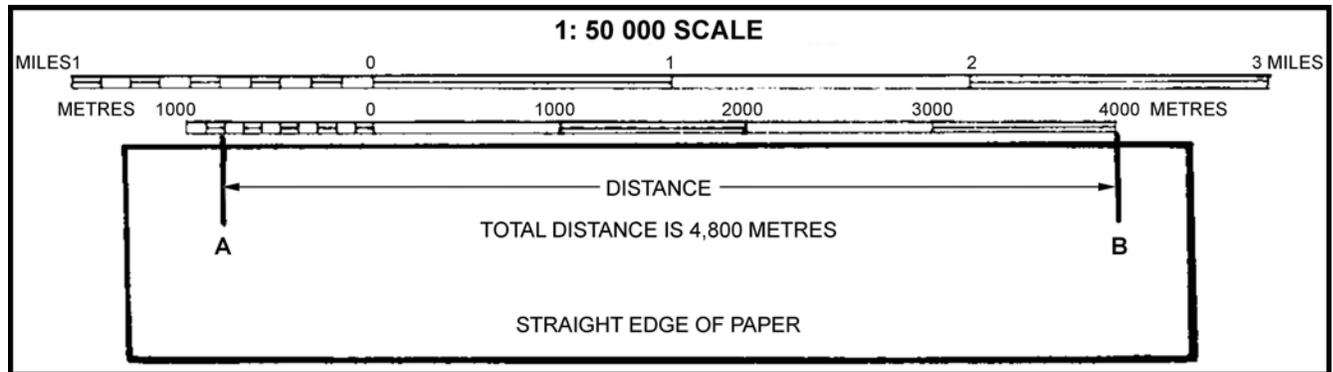
To measure a distance point-to-point:

1. Lay the straight edge of a piece of paper against the two points.
2. With a sharp pencil, mark the paper at the A (start) and B (finish) points.
3. Lay the paper just under the scale bar (metres) and move the B mark backwards to each thousands mark until the A mark falls within the subdivided thousands (hundreds) to the left of the zero.
4. To calculate the total distance, add the number of thousands where the B mark is, plus the number of subdivided thousands where the A mark is to the left of the zero.



A-CR-CCP-121/PT-001 (p. 5-24)

Figure 16-6-1 Measuring Distance Point-to-Point



A-CR-CCP-121/PT-001 (p. 5-25)

Figure 16-6-2 Calculating Distance

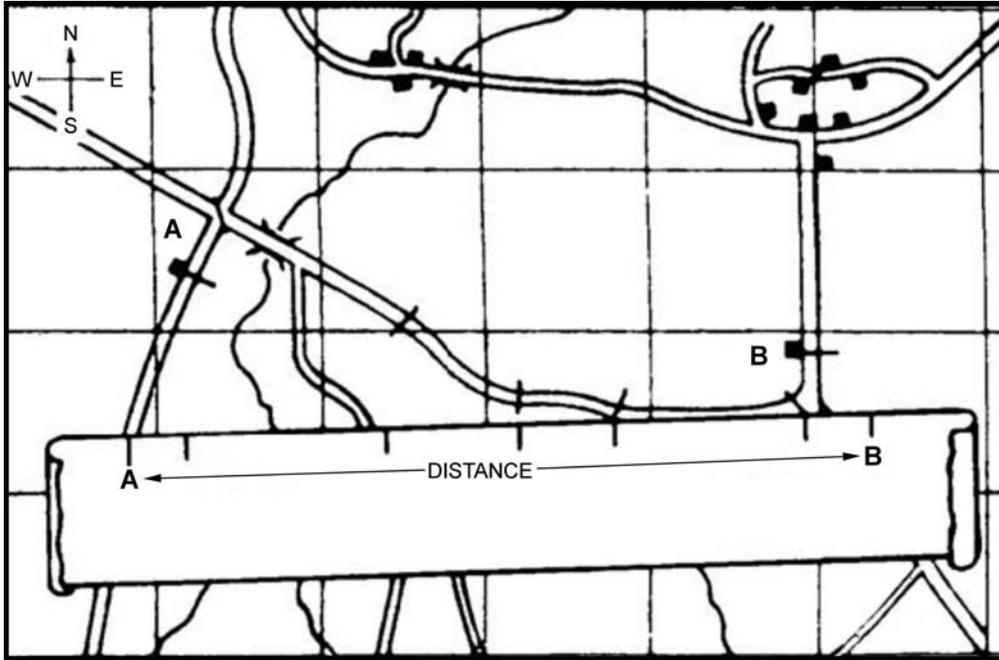


For a distance that is longer than 5 000 m, measure the first 5 000 m and mark the paper with a new line and label it '5 000 m'. Place the new mark at the zero or thousands mark until the A mark fits within the subdivided thousands bar. Add the total of that distance to the 5 000 m and that will be the total distance.

Measuring Along a Route

Sometimes the cadets need to find the distance between A and B around curves in a road or along a planned route. To measure a distance along a route between two points:

1. Lay the straight edge of a piece of paper against point A.
2. With a sharp pencil, mark point A on the paper and the map.
3. Line up the paper with the edge of the road until you come to a curve and make another mark on the paper and on the map.
4. Pivot the paper so that it continues to follow the road edge. Repeat until you reach point B.
5. Mark your paper and the map at point B.
6. Lay the paper just under the scale bar (metres) and move the B mark backwards to each thousands mark until the A mark falls within the subdivided thousands to the left of the zero.
7. Add the number of thousands where the B mark is, plus the number of subdivided thousands where the A mark is to the left of the zero, to determine the total distance.



A-CR-CCP-121/PT-001 (p. 5-25)

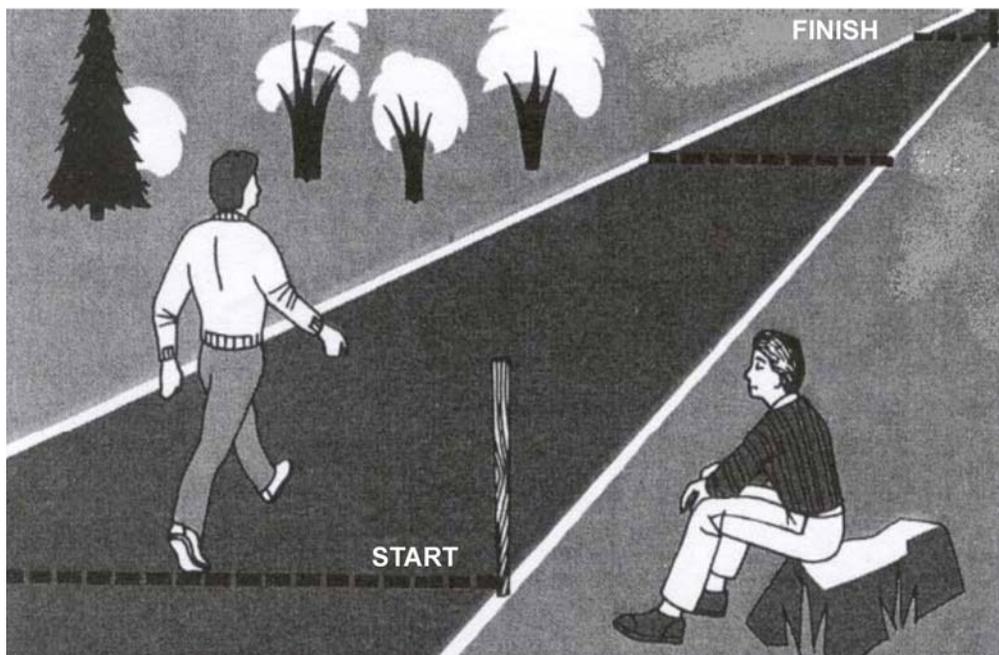
Figure 16-6-3 Measuring Distance Along a Route

DETERMINING INDIVIDUAL PACE

Pace Counting Method

The pace counting method (pacing) is used for measuring a given distance by counting every other step. Two steps equal one pace. Pacing is a very important skill in navigation, as each person has a different pace and needs to determine their pace before it can become a useful measurement tool. Pacing varies between individuals as it uses a natural stride – an average adult will pace about 60–70 paces in 100 m.

To determine an individual pace, practice taking uniform, comfortable steps over a measured distance (100 m) counting every second step of the dominant foot. Do this three to five times. The average will be the individual's pace number and should be remembered.



B. Kjellstrom, Be Expert with Map & Compass, Hungry Minds, Inc. (p. 53)

Figure 16-6-4 Determining Distance Using Pacing



Remember, pacing is an approximation. A margin of error of 1–2 percent is considered reasonable (eg, 10–20 m for every 1 km walked).

Factors That Affect Pacing

Pacing can be affected by different factors and numbers may vary. Some of the factors and their affect on individual pacing are:

- **Topography.** This is the most common factor. Walking through mud, thick bush and tall vegetation can shorten the paces.
- **Slopes.** Walking uphill will shorten the paces, while walking downhill will lengthen the paces.
- **Fatigue.** Pacing may change from natural in the morning, when cadets are rested, and shorter in the afternoon as they start to get tired.
- **Equipment.** Equipment could affect pacing, such as the wrong type of footwear. Too much or too little clothing and the amount of equipment being carried can shorten the paces.
- **Weather.** Heavy rain, wind velocity, temperature and snow can shorten the paces.



Pacing beads can be used to keep track of the distance walked. One bead is moved for every 100 m walked. If pacing beads are not available, stones can be used by moving them from one pocket to another to count every 100 m.

ORIENTING A MAP USING A COMPASS

To orient a map using a compass:

1. Check and set the current declination on the compass.
2. Set the compass dial to read 00 (zero) mils or 0 degrees (north).
3. Lay the compass flat on the map with the cover open.
4. Orient the compass to point the mirror to north (top of the map).
5. Align one side of the base plate with an easting line.
6. Turn the map and compass together until the red end of the magnetic needle is over the orienting arrow.



The mnemonic used to remember to put the magnetic needle over the orienting arrow is "Red in the Bed".



Director Cadets 3, 2007, Ottawa,
ON: Department of National Defence

Figure 16-6-5 Set Declination



Director Cadets 3, 2007, Ottawa,
ON: Department of National Defence

Figure 16-6-6 Set Compass to 00



Director Cadets 3, 2007, Ottawa,
ON: Department of National Defence

Figure 16-6-7 Turn
Until Red is in the Bed

TAKING A MAGNETIC BEARING

A compass can be used to identify the cardinal points such as north and south, the direction of travel and the bearing from one's current location to a prominent object. However, the ability to take a magnetic bearing of a prominent object and to use that information to help identify one's general location can save hours when trekking. A magnetic bearing is a quick method for determining the direction of travel.

There are two ways to determine a magnetic bearing.

Using a Prominent Object in Sight

To determine the magnetic bearing of a prominent object:

1. Check and set the predetermined declination on the compass.
2. Hold the compass at eye level, at arms length, and face the prominent object.
3. Aim at the object using the compass sight, ensuring the sighting line is in line with the index pointer.
4. Adjust the compass cover so the compass dial is seen in the sighting mirror.
5. Look in the mirror and turn the compass dial until the magnetic needle is over the orienting arrow (red in the bed).
6. Read the number on the compass dial at the luminous index pointer. The magnetic bearing of the prominent object is read at the luminous index pointer.



A-CR-CCP-121/PT-001 (p. 5-42)

Figure 16-6-8 Taking a Magnetic Bearing

Using a Map

To determine a magnetic bearing using a map:

1. Set the predetermined declination on the compass.
2. Identify and mark the start (Point A) and finish (Point B) points on a map.
3. Draw a plotting ray from Point A to Point B.
4. Lay the fully opened compass with the edge of the compass base plate along the plotting ray, in the direction of travel (Point A to Point B).
5. Hold the compass in place, rotate the compass dial so that the compass meridian lines align with the easting lines on the map, ensuring north on the dial indicates north on the map.

6. Read the number on the compass dial at the luminous index pointer.



Prior to determining a magnetic bearing on a map, it is good practice to first estimate the bearing by drawing a quick compass rose and looking at where the bearing would be on the compass rose. This serves as a good check to ensure the cadet has not accidentally measured the back bearing.



If the bearing is taken from Point B to Point A, the compass will be pointing 180 degrees or 3200 mils in the exact opposite direction of travel wanted. This is called a back bearing.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in the activity in TP 2 will serve as the confirmation of this TP.

Teaching Point 2

Conduct a Navigation Activity

Time: 40 min

Method: Practical Activity

BACKGROUND KNOWLEDGE

DESCRIBING BEARINGS

Bearing. A bearing is an angle that is measured clockwise, from a fixed zero line; north is always this zero line. Simply, a bearing is just another name for an angle.

Types of Bearings

There are three different types of bearings:

Grid Bearing. A grid bearing is a bearing that is measured between two points on a map. The ability to measure a bearing from a map allows a map user to plan routes or activities before going into the field, and allows an easy method of communicating information about movement or location.

Magnetic Bearing. A magnetic bearing is a bearing that is measured between two points using a compass. A magnetic bearing is a quick and efficient method of describing a route to take. The bearing alone is usually not enough information to navigate with and must also have distance or a target object.

Back Bearing. A back bearing is a bearing that is in the exact opposite direction of the bearing that has been measured. A back bearing can be useful for different reasons; to return to the start location after a hike, or to calculate the bearing from an object to one's current location. Depending on the compass being used, the steps to calculate a back bearing are:

- When the bearing is less than 3200 mils or 180 degrees, add 3200 mils or 180 degrees.
- When the bearing is greater than 3200 mils or 180 degrees, subtract 3200 mils or 180 degrees.

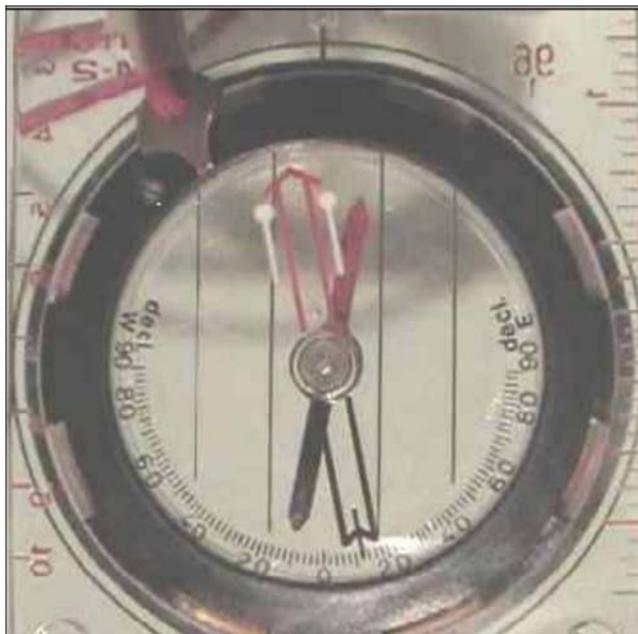
SETTING DECLINATION ON A COMPASS

The compass's declination scale must be set to compensate for the difference between true north and magnetic north. To do this the amount of declination in degrees east or west is needed. Then, turn the compass over and look at the back of the dial.

From the zero point, using the screwdriver on the end of the safety cord, turn the declination screw to the right for west and to the left for east declination. Each small black line is two degrees.



When setting declination on a compass, it is easier to hold the screwdriver and turn the compass, especially in cold weather. The declination shall *never* be turned past 90 degrees on the declination scale.



Director Cadets 3, 2007, Ottawa, ON: Department of National Defence

Figure 16-6-9 Declination Screw

ACTIVITY

OBJECTIVE

The objective of this activity is for the cadet to navigate along a route.

RESOURCES

- Topographical map of the area (one per team),
- Compass (one per team),
- Start and end point GR,
- Paper, and
- Pencils.

ACTIVITY LAYOUT

N/A.

ACTIVITY INSTRUCTIONS

In expedition teams, cadets will navigate a route as part of the practical expedition activity. The mode of travel will vary with each expedition centre. During the activity, cadets will:

1. describe bearings;
2. set declination on a compass;
3. determine distance between two points on a map;
4. determine individual pace;
5. orient a map using a compass;
6. take a magnetic bearing; and
7. travel on a series of bearings along a route.

SAFETY

N/A.

CONFIRMATION OF TEACHING POINT 2

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

END OF LESSON CONFIRMATION

The cadets' participation in navigating along a route will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK/READING/PRACTICE

N/A.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-703/PG-001, Chapter 3, Annex B, Appendix 7 (326 PC).

CLOSING STATEMENT

Map and compass skills take a great deal of practice for a person to become efficient using them in the field. Throughout expeditions, cadets will always be required to navigate routes. Take every opportunity to practice map and compass, whether it is navigating a route or riding a bike. The skills learned in Green and Red Star navigation are building blocks. There are still more navigation skills to acquire.

INSTRUCTOR NOTES/REMARKS

Assistant instructors may be required for this lesson.

Expedition centres are required to select two dynamic modes of travel from EO M326.02a (Paddle a Canoe, Section 2), EO M326.02b (Ride a Mountain Bike, Section 3), and EO M326.02c (Hike Along a Route, Section 4) to incorporate into their weekend training.

This EO has been allocated one period in the overall course period allocation. Each expedition centre may adjust this allocation to reflect the choice of activities, facilities and available resources at the expedition centre.

Timings for this EO will vary. While there is a requirement for some initial training, the focus should be on having the cadets practice navigation techniques during the practical expedition activity.

REFERENCES

- A2-041 B-GL-382-005/PT-001 Canadian Forces. (2006). *Maps, Field Sketching, Compasses and the Global Positioning System*. Ottawa, ON: Department of National Defence.
- C0-011 Canadian Orienteering Federation. (1985). *Orienteering Level Two Coaching Certification*. Ottawa, ON: Canadian Orienteering Federation.
- C2-041 (ISBN 0-07-136110-3) Seidman, D., & Cleveland, P. (1995). *The Essential Wilderness Navigator*. Camden, ME: Ragged Mountain Press.

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ROYAL CANADIAN ARMY CADETS

SILVER STAR

INSTRUCTIONAL GUIDE



SECTION 7

EO M326.05 – USE EXPEDITION EQUIPMENT

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-703/PG-001, 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.

Refer to the owner's manual for the operating instructions for the following items:

- single-burner mountain stove,
- water filter,
- fuel bottle,
- fuel,
- rope,
- pocket knife/multipurpose tool,
- carabiner, and
- headlamp.

PRE-LESSON ASSIGNMENT

N/A.

APPROACH

Demonstration and performance was chosen for this lesson as it allows the instructor to explain and demonstrate the uses of expedition equipment while providing an opportunity for the cadets to practice operating this equipment under supervision.

INTRODUCTION

REVIEW

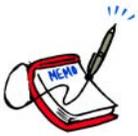
N/A.

OBJECTIVES

By the end of this lesson the cadet shall be expected to safely employ equipment required during an expedition.

IMPORTANCE

It is important for cadets to understand how to operate equipment being used on expedition training so that they can safely use the equipment. Proper working equipment will make expedition training safer and efficient. Correctly using equipment will ensure the equipment lasts longer and requires less maintenance.



For this skill lesson, it is recommended that instruction take the following format:

1. Explain and demonstrate the complete skill while cadets observe.
2. Explain and demonstrate each step required to complete the skill. Monitor cadets as they imitate each step.
3. Monitor the cadets' performance as they practice the complete skill.

Note: Assistant instructors may be employed to monitor cadet performance.

Teaching Point 1

Explain, Demonstrate and Have the Cadet Operate a Single-Burner Mountain Stove

Time: 25 min

Method: Demonstration and Performance



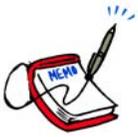
Refer to the owner's manual for the operating instructions for the single-burner mountain stove.



This TP focuses on expedition equipment that the cadets may not have been introduced to before. When available, have examples of each piece of equipment and pass them around so the cadets can see the equipment and handle it.

During an expedition it is important that cadets are aware of the equipment that is being brought. Cadets should know the various uses for each piece of equipment, how it works and how to make basic repairs as required.

The stoves used at expedition centres are single-burner mountain stoves. These stoves are used because of size, weight and functionality. Single-burner mountain stoves are portable stoves that allow cooking anywhere without having to make a fire. These stoves are stored easily and can be carried during an expedition. Single-burner mountain stoves are commonly fuelled by using white gas such as naphtha and can perform well in extreme cold and high altitudes.



The stove featured in this lesson is the Coleman Peak One, if another is used, substitute information from the owner's manual.

IDENTIFYING PARTS AND ACCESSORIES

The Coleman Peak One single-burner mountain stove has the following characteristics:

- powerful 7500 BTUs with precise flame control,
- fold out legs that collapse for storage and keeps the stove stable,
- liquid fuel appliance offers superior operational fuel and cost efficiency,
- integrated 350-mL fuel tank,
- one fill-up per weekend of camping,
- 2-hour burn time on high, 7.5 hours on low, and
- boils 0.94 L (one quart) of water in four minutes.



The diagram provided is for part identification, not disassembly purposes.

The parts and accessories of a single-burner mountain stove are:

Burner Plate. Fitted with a grate to ensure cookware remains stable.

Stove Grate. The stove grate supports pot sets and ensures pots remain stable.

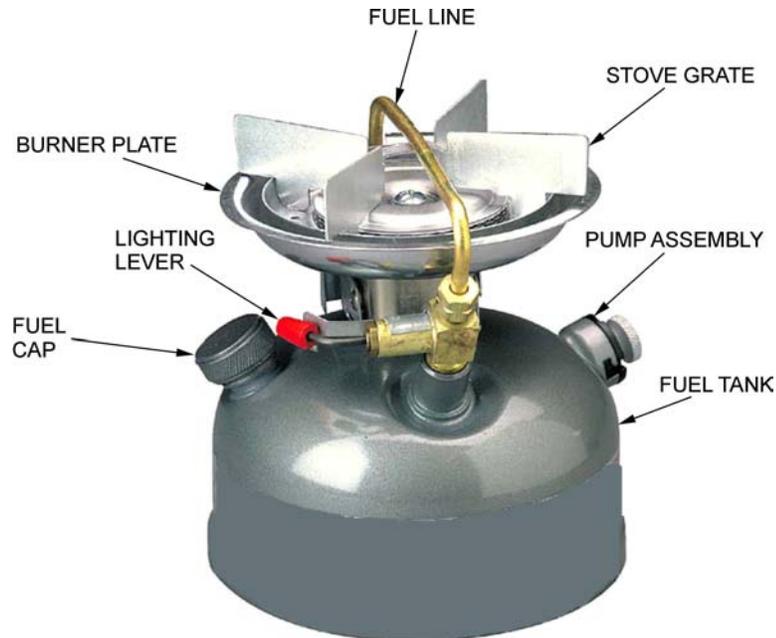
Fuel Line. The line from the fuel tank that provides the burner plate with fuel.

Pump Assembly. The pump assembly is fitted into the tank and is held in place by a locking mechanism.

Lighting Lever. The lighting lever is the on/off switch for the stove.

Fuel Cap. The fuel cap keeps the fuel from spilling.

Fuel Tank. The fuel tank is on the bottom of the stove. This tank is only intended to be filled to three quarters full, allowing air in for pressurization.



“Backpackgear Online”, Copyright 2007 by Maguire and Johnson Web Services. Retrieved March 28, 2007, from http://www.coleman.com/coleman/colemancom/detail.asp?product_id=533B705&categoryid=2020

Figure 16-7-1 Single-Burner Mountain Stove

IDENTIFYING FUEL TYPE AND OPERATIONAL TEMPERATURES

The stove uses naphtha fuel.

It is operational in all types of temperatures.

ASSEMBLY

The single-burner mountain stove comes assembled. The fold out legs only need extending.

LIGHTING AND EXTINGUISHING

Precautions

Hazards are few if precautions are taken. Follow these few simple rules:

- Never leave the stove unattended.
- Do not use a stove as a heating device or in enclosed spaces such as buildings, tents or caves.
- Never loosen the filler cap on the fuel tank while the stove is in operation.
- Always fill and light the stove outside in a well ventilated area, away from open flame, heat and combustibles.
- Use only naphtha fuel.
- Store away from open flame or excessive heat.
- Before transporting or storing, ensure the stove is cool. Loosen the filler cap to release air pressure and retighten. Turn the control knob off.
- If the stove catches fire, turn off the fuel supply.

- When using the stove ensure a fire extinguisher is available.



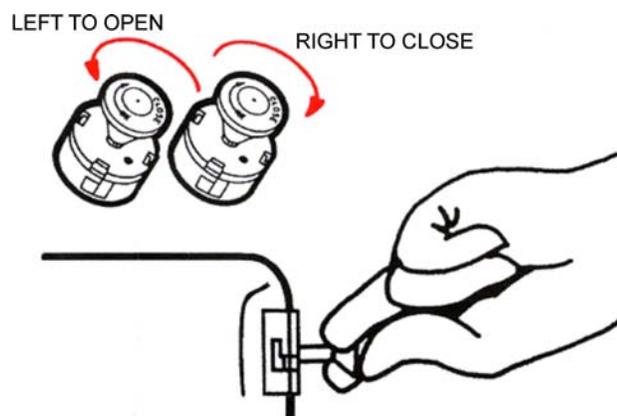
Stoves must not be used in enclosed spaces such as buildings and tents. The burning of naphtha and other fuels results in the release of carbon monoxide. Carbon monoxide binds with hemoglobin 200–250 times better than oxygen, and disrupts almost all physiologic and neurologic systems, even in fairly low concentrations. The gas is heavier than air, and pools in the low ground of tents and caves where outdoor enthusiasts sleep, and will not go away for days unless it is forced out by a strong, persistent direct draft of cold air at the height of the pooled gas. Preventing the problem in the first place requires a similarly active draft at the bottom of the stove, not at the top of the tent or cave as was once thought.

According to one recent research study, asphyxiation in tenting situations kills three times as many people yearly than mountaineering does. Other research has linked even moderate exposure to carbon monoxide to significant long-term effects, including depressed mood, apathy, disorientation, irritability and amnesia. Several of these symptoms occur in 100 percent of individuals exposed and can be measured years after the initial exposure. Risks also increase in higher altitudes.

Priming the Single-Burner Mountain Stove

To prime the single-burner mountain stove follow these steps:

1. Make sure the control knob is in the OFF position.
2. Turn the pump rod two full turns counter-clockwise to open.
3. Place the thumb over the air vent of the pump rod handle.
4. Pump 30–40 strokes to pressurize the fuel tank.
5. Turn the pump rod clockwise until it is closed tight.



The Canadian Coleman Co., Coleman Camp Stove Model M425F710C Instructions for Use, The Canadian Coleman Co.

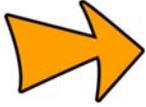
Figure 16-7-2 Priming the Fuel Tank

Lighting the Burner

To light the burner follow these steps:

1. Do not lean over the stove while lighting.
2. Hold a lit match near the burner.

3. Turn the control lever to the LIGHT position.
4. Monitor the flame.
5. When the flame turns blue in colour (approximately one minute), turn the instant light lever down and turn the control knob to the desired heat setting (HI-LO).



Should the stove fail to light or the match goes out before ignition, turn the control lever to the OFF position and wait two minutes before attempting to light the stove again.

Extinguishing the Burner

To extinguish the burner follow these steps:

1. Remove cookware from the stove and turn the instant light lever to the OFF position.
2. Turn the control lever clockwise to the OFF position and close firmly.

Storing After Use

To store the single-burner mountain stove follow these steps:

1. Allow the stove to cool before packing.
2. Ensure the stove is clean and any dirt, matches, etc are removed.
3. Empty all fuel from the stove.
4. Store the stove in a cool, dry location.

CONFIRMATION OF TEACHING POINT 1

The cadets' participation in lighting a stove will serve as the confirmation of this TP.

Teaching Point 2

Explain, Demonstrate and Have the Cadet Operate a Water Filter

Time: 5 min

Method: Interactive Lecture

A water filter can be used to strain out most parasites and micro-organisms by pumping the water through a filter. A filter is made of a thick porous material such as carbon or ceramic which trap particles as the water flows through it.



Contamination by wildlife, farm animals, pollutants or other hikers may introduce micro-organisms into water sources that can cause intestinal problems. It is imperative that all collected water is treated before being consumed. Filtering is the best way.

IDENTIFYING CHARACTERISTICS



Refer to the owner's manual for the operating instructions for the water filter.

The following are characteristics of the ceramic water filter:

- filters at a 1 L per minute flow rate;
- effective against all protozoa, most bacteria, and chemicals including iodine and chlorine; and
- includes foam pre-filter.

The MSR WaterWorks water filter (as illustrated in Figure 16-7-3) is a rugged and lightweight water filter. Its polyurethane construction and carbon-cored ceramic filter element removes larger bacteria and some chemicals (iodine and chlorine) along with odours and tastes.

A gauge is supplied to determine when the ceramic filter needs replacing.

IDENTIFYING PARTS AND ACCESSORIES



The diagram provided is for part identification, not disassembly purposes.



"Mountain Equipment Coop", Copyright 2007 by Mountain Equipment Coop. Retrieved November 16, 2007, from http://www.mec.ca/Products/product_detail.jsp?PRODUCT%3C%3Eprd_id=845524442372421&FOLDER%3C%3Efolder_id=2534374302696689&bmUID=1195238644467

Figure 16-7-3 Water Filter

Pumping Handle. The lever that allows the user to pump the water.

Filter Cap. A protective covering that covers the ceramic filter.

Ceramic Filter. Located within a plastic enclosure, the water filter has a 0.2 micron membrane that removes bacteria and acts as a second line of defence around the ceramic filter. The wide-mouth base reduces spillage and the risk of cross-contamination with unfiltered water.

Filter Gauge. Gauge used to determine when filter requires replacement.

ASSEMBLY

The water filter should be assembled and ready to use. To use:

1. Remove the filter cap.
2. Begin pumping the handle in a steady manner to pump water.

MAXIMUM FILTERING CAPACITY

Normal conditions will allow a user to filter between 10–20 L of water between cleanings.

PUMPING WATER

To pump water:

1. Place the hose with the float end in the water source. (If a bucket or pot is available, collect water in the bucket or pot and filter from there). This will assist in keeping dirt out of the filter.
2. Attach the filter to a wide-mouth bottle.
3. Pump the pumping handle a few times to prime the pump.
4. Pump the handle to draw water until the bottle is full.

DISMANTLING AND CLEANING

Any excess water should be released from the filter and the filter should be allowed to air dry. This will prevent the growth of mold, mildew and bacteria.

When storing for long term, the ceramic filter should be removed and air dried for 3–5 days. Wash and dry other filter parts thoroughly.

CONFIRMATION OF TEACHING POINT 2

The cadets participation in using a water filter will serve as the confirmation of this TP.

Teaching Point 3

Explain, Demonstrate and Have the Cadet Safely Use Expedition Equipment

Time: 15 min

Method: Demonstration and Performance



Refer to the owner's manual for the operating instructions for the fuel bottle, rope, pocket knife, carabiner and headlamp.



When using equipment, everyone should:

- Store equipment in a secure place. Never leave equipment lying around or touching the ground.
- Always use the right tool for the job.
- Follow the safety procedures for using the equipment.
- Keep the edges of blades sharp and handles tight.
- Clean and lightly oil steel parts before storage.

FUEL BOTTLE

Fuel is carried in a separate container to ensure there is no spillage of fuel in the pack. Fuel containers are either aluminum or plastic. Aluminum containers are usually a cylindrical aluminum bottle. Plastic bottles are usually red in colour and have a fluoropolymer inner coating that resists both gasoline and alcohol. Plastic fuel bottles should never be used as a tank for a stove or be pressurized with a pump. Once a container is used for a particular type of fuel it should not be used for another fuel, as the substances will combine and deteriorate the container or combust.



"Mountain Equipment Coop", Copyright 2007 by Mountain Equipment Coop. Retrieved March 28, 2007, from http://www.mec.ca/Products/product_detail.jsp?PRODUC%3C%3Eprd_id=845524441772275&FOLDER%3C%3Efolder_id=2534374302696497&bmUID=1175178016804

Figure 16-7-4 Aluminum Fuel Bottle

Storing Techniques

During expedition training, fuel bottles will be stored with cooking equipment or in the designated location specified by the instructors.

Fuel bottles should be stored empty whenever possible.

If the bottle is being stored with fuel, it should be stored in a locked area, away from any flammables and other explosive materials.

Transferring Fuel to and From the Fuel Bottle

When transferring fuel to and from the fuel bottle, a funnel or spigot should be used to prevent splashes, leaks and spills.

ROPE

While rope can be heavy to carry, it is an extremely advantageous piece of expedition equipment. A length of rope, approximately 15 m, can be used to hang food in the food hang, make a clothesline to dry clothing or tie a tarp to make a shelter when there is inclement weather. It can also be used to complete minor field repairs.

Cleaning

Ropes should be washed frequently with a soap. Hang the rope to dry, out of direct sunlight.

Storing

Storing a rope should only be done when it is completely dry, free of knots and coiled loosely. Ropes should be stored in a cool, dry place away from sunlight, heat, and chemicals.

Coiling

Depending on the length of the rope, rope should be coiled using a mountaineer's coil or a butterfly coil.

POCKET KNIFE/MULTIPURPOSE TOOL

A pocket knife or multi-purpose tool is essential for repairing equipment and cutting rope, cord or bandages. The key is to find a knife or tool that is small but has a blade, scissors, and screwdriver that are required while out on an expedition.

Sharpening

Blades should be sharpened regularly with a proper sharpening stone or tool. It is important to follow the manufacturer's directions regarding care.

Holding

A firm grip should be taken on the handle of any knife. If the pocket knife has a locking mechanism, it should be used.

Storing

All pocket knives should be cleaned before storage. Pocket knives should be stored in their sheaths and oiled prior to long-term storage.



"Mountain Equipment Coop", Copyright 2007 by Mountain Equipment Coop. Retrieved November 16, 2007, from http://www.mec.ca/Products/product_detail.jsp?PRODUCT%3C%3Eprd_id=845524441773603&FOLDER%3C%3Efolder_id=2534374302696789&bmUID=1195240440348

Figure 16-7-5 Multi-Purpose Knife



"Mountain Equipment Coop", Copyright 2007 by Mountain Equipment Coop. Retrieved November 16, 2007, from http://www.mec.ca/Products/product_detail.jsp?PRODUCT%3C%3Eprd_id=845524442622475&FOLDER%3C%3Efolder_id=2534374302696889&bmUID=1195240570229

Figure 16-7-6 Multi-Purpose Tool

CARABINER

A carabiner is a common piece of equipment used primarily in mountaineering activities such as climbing and abseiling. On an expedition, a carabiner is an essential piece of equipment as it can be used in a variety of circumstances, such as:

- attaching the tether line in the canoe or to a pack;
- clipping a water bottle to the outside of a pack;
- stringing up a food hang or clothesline; and
- attaching a throw bag to the thwart of the canoe.

HEADLAMP

A headlamp is simply a flashlight that has been attached to an adjustable strap that fits around the user's head. It is very beneficial while out on an expedition as it frees up the user's hands to complete tasks after dark, such as reading a map, lighting a stove, setting up a tent or finding the bathroom.



"Mountain Equipment Coop", Copyright 2007 by Mountain Equipment Coop. Retrieved November 16, 2007, from http://www.mec.ca/Products/product_detail.jsp?PRODUCT%3C%3Eprd_id=845524442621000&FOLDER%3C%3Efolder_id=2534374302697057&bmUID=1195238790425

Figure 16-7-7 Headlamp



Headlamps can use a combination of light-emitting diodes (LED) and halogen bulbs. Choosing a headlamp will vary depending on use. Halogen bulbs offer the brightest output, but use battery power fast. LED bulbs give off sufficient light and are very efficient.



Extra batteries must always be brought to supplement those currently in the headlamp.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS

- Q1. Why is it preferable to have a headlamp with both LED and halogen bulbs?
- Q2. What are some of the materials that water filters are made from?
- Q3. What can a carabiner be used for?

ANTICIPATED ANSWERS

- A1. Halogen bulbs offer the brightest output, but use battery power very fast. LED bulbs do not give off as much light, but are very efficient.
- A2. Filters can be made from a thin sheet with precisely-sized pores which prevent all objects larger than the pores from moving through it or from thick porous materials such as carbon or ceramic which trap particles as the water flows through it.
- A3. Carabiners can be used for:
 - attaching the tether line in the canoe or to the expedition field pack;

- clipping a water bottle to the outside of the expedition field pack;
- stringing up a food hang or clothesline; and
- attaching a throw bag to the thwart of the canoe.

END OF LESSON CONFIRMATION

The cadets' participation in using expedition equipment will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK/READING/PRACTICE

N/A.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-703/PG-001, Chapter 3, Annex B, Appendix 7 (326 PC).

CLOSING STATEMENT

Knowing how to properly use, and store expedition equipment will allow the cadets to successfully complete training without added assistance from instructors or staff.

INSTRUCTOR NOTES/REMARKS

Additional staff may be required to supervise cadets using expedition equipment.

Instructors should refer to the owner's manual for the operating instructions for the single-burner mountain stove.

Instructors should refer to the owner's manual for the operating instructions for the water filter.

Instructors should refer to the owner's manual for the operating instructions for the fuel bottle, rope, pocket knife, carabiner and headlamp.

It is recommended that this EO be taught where opportunities exist rather than in a structured 60-minute period.

Expedition centres are required to select two dynamic modes of travel from EO M326.02a (Paddle a Canoe, Section 2), EO M326.02b (Ride a Mountain Bike, Section 3), and EO M326.02c (Hike Along a Route, Section 4) to incorporate into their weekend training.

This EO has been allocated one period in the overall course period allocation. Each expedition centre may adjust this allocation to reflect the choice of activities, facilities and available resources at the expedition centre.

Timings for this EO will vary. While there is a requirement for some initial training, the focus should be on having the cadets practice hiking techniques through practical application.

Upon arrival at the expedition centre cadets will be broken into teams/groups. These teams/groups will remain the same for the duration of the weekend.

REFERENCES

N/A.

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ROYAL CANADIAN ARMY CADETS

SILVER STAR

INSTRUCTIONAL GUIDE



SECTION 8

EO M326.06 – FOLLOW DAILY ROUTINE

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-703/PG-001, 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

N/A.

APPROACH

A demonstration was chosen for TP 1 as it allows the instructor to explain and demonstrate campsite selection.

An interactive lecture was chosen for TPs 2–4 to orient the cadet to following campsite routines during expedition training.

INTRODUCTION

REVIEW

N/A.

OBJECTIVES

By the end of this lesson the cadet shall be expected to follow daily routine during expedition training.

IMPORTANCE

It is important for cadets to understand the procedures involved in selecting a campsite and the routine that is to be followed during the occupation of that campsite. The departure routine is equally important in order to maintain organization and safety. The information in this lesson will assist the cadets during all corps exercises and expedition training.

Teaching Point 1**Demonstrate Campsite Selection**

Time: 10 min

Method: Demonstration



The information in this TP has been previously taught. Instructors should demonstrate campsite selection in an area that will allow cadets to recognize the tasks involved.



When selecting a campsite, ensure permission is obtained from the park authority. Failure to do so could result in fines being issued by provincial or federal parks officers.

Determining the suitability of a campsite is key to the enjoyment of the time spent there. After a long day it is important that the cadets take the extra few minutes to choose an appropriate campsite.



Great campsites are found, not made. At the end of a day of travel take the pack off, put on a warm layer and drink something, eat if low on energy, then look for a good campsite. It is important that there is not a lot of time spent on this task.

DETERMINING THE SUITABILITY OF A CAMPSITE**Absence of Potential Hazards**

Fallen Trees/Branches. Look up and around the campsite. Is there a potential for limbs of trees to fall on the tent or campsite?

Care must be taken as the cadets can easily trip over fallen trees/branches. A sharp branch can also cause damage to equipment such as tents and groundsheets. Tent sites should not be set up where fallen trees are present. However, fallen trees can mark boundaries, hold signs and help weatherproof a site.

Areas with dead trees should be avoided. Dead trees lack strength and therefore should not be in the area when considering a campsite. These trees can easily fall during high winds and storms. Also, look closely for any branches that may fall.



“Colby-Sawyer College”, Kelsy Forest Walk, Copyright 2007. Retrieved November 22, 2007, from www.colby-sawyer.edu/images/image_9614.jpg

Figure 16-8-1 Fallen Trees

Poisonous Plants. Always look for poisonous plants prior to setting up a campsite. Common poisonous plants such as poison ivy, poison sumac and poison oak were identified in EO M121.05 (Recognize Environmental Hazards, A-CR-CCP-701/PF-001, Chapter 10, Section 5). Contact with poisonous plants will cause severe itching of the skin, red inflammation and blistering. Keep campsites away from areas containing poisonous plants.

Insects, Beehives and Hornet’s Nests. Most insects are a nuisance rather than a danger. When bothered by insects like mosquitoes, blackflies and deer flies/chiggers, hikers have several options available to thwart such nuisances and reduce exposure by controlling their surroundings. Try to avoid camping areas with tall grass, weeds and standing water where insects are abundant.

In the field, beehives and hornet’s nests can be found in trees, shrubs and even in the ground. When nests are disturbed, bees and hornets will get defensive and sting. Always look for beehives and hornet’s nests before setting up a campsite. A good sign that a hive or nest is nearby is when a large number of bees or hornets are flying around.



P. Tawrell, Camping and Wilderness Survival, Paul Tawrell (p. 898)

Figure 16-8-2 Hornet's Nest

Ant Hills. Once disturbed, ant hills can become a big nuisance. Check the ground for ant hills prior to setting up a campsite.

Animal Dens. Prior to setting up a campsite, look for any areas that may be near animal dens. A group of cadets could easily disturb resting animals. A den may be found on a trail or at the end of a trail in the field.

Accessible Water

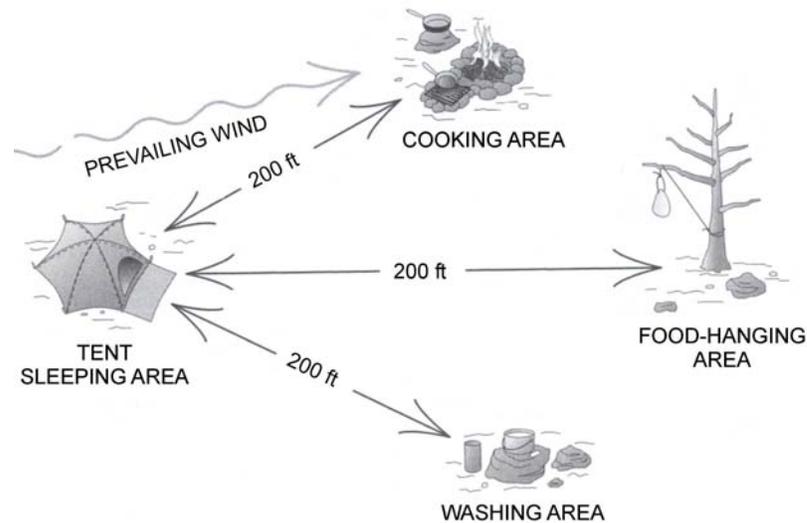
There should be an accessible water point within 60 m (200 feet) of the campsite. When in the wilderness, water sources can become contaminated very easily by such things as soap and feces.

Distancing the campsite from the accessible water point is an important step to ensure that contaminants from cooking and human waste do not pollute the water.

Space for Tents

There should be enough space for all tents and they should not have guy lines overlapping each other. Ideally, tents should be roughly 5 m (15 feet) away from each other to avoid this.

DETERMINING THE CAMPSITE LAYOUT



R. Curtis, The Backpackers Field Manual, Three Rivers Press (p 113)

Figure 16-8-3 Common Campsite Layout

Sleeping Area

Above all, the sleeping area should be upwind of the cooking area. Flat ground works best. If there is a slight angle in the ground, it is best to lie with the head uphill.

There may be many cadets in the field at any given time. It is important that tents are spread out. In both the male and female lines, tents should be spaced at least 5 m apart. Where guy lines exist, there must be adequate space between tents so the cadets can easily walk without stepping over lines.

By spacing tents a small distance apart, the cadets are provided with privacy, while still being able to easily communicate.



When night falls, shelters may be hard to see. When shelters are close together there is a greater chance of having an accident, such as tripping over guy lines.

It is a good idea to mark the guy lines with flagging tape or Glow Sticks.

Washroom/Latrine

Whenever possible, existing outhouses should be used. The smell in existing outhouses may be concentrated, but using them instead of catholes all over the area, will minimize the impact on the environment.

Washrooms/latrines are often the most uncomfortable thing to set up when camping. If group members will be using individual catholes, each cathole should be at least 60 m (200 feet) from water sources. In addition to the distance, the group should establish a route out of the campsite which the group will use.

In a group setting, it is best to set up a toilet and then pack out the waste. A group latrine should be downwind at least 60 m (200 feet) from the sleeping area as well as any trails or water sources.

Cooking Area

This is the area where most campers will spend the majority of their time. Naturally, the cooking area is popular due to the time spent cooking, washing dishes or eating a quick snack.

The best cooking area location is a durable surface such as a large flat rock or sandy area. If a durable surface cannot be found, meadow grass or gravel are the next best choices.

In some situations it may be beneficial to set up a separate area for eating. This is recommended for larger groups to prevent people from milling around hot stoves and boiling water, which are a primary source of accidents. The eating area can be just metres away.

Fire Area

Be aware of the fire regulations in the area being used. Certain times, especially late summer when forest fires are likely, there are often fire restrictions.



Discuss how the Fire Weather Index and the Canadian Forest Fire Danger Rating System (CFFDRS) measures the possibility of forest fires.

Pay attention to any individuals who may exhibit bad habits when dealing with fire and work to correct their bad habits.

Safety is paramount when lighting a fire. Be sure fire safety equipment is available when lighting fires.

Parks commonly follow the Fire Weather Index, which provides an assessment of relative fire potential that is based solely on weather observations. Check with park administration for rules and regulations when planning to light fires within the park boundaries.

Canadian Forest Fire Danger Rating System (CFFDRS)

The CFFDRS is Canada's national system for rating forest fire danger. The system evaluates and integrates data to help managers predict woodland fire potential.

The CFFDRS provides an index (see Figure 16-8-1) on how easy it is to ignite vegetation, how difficult a fire may be to control, and how much damage a fire may do.

BLUE	GREEN	YELLOW	ORANGE	RED
LOW	MODERATE	HIGH	VERY HIGH	EXTREME

Director Cadets 3, 2007, Ottawa, ON: Department of National Defence

Figure 16-8-4 CFFDRS Fire Index

Low. Low chance of fires occurring. Fires that do occur are likely to be self-extinguishing and new ignitions are unlikely.

Moderate. Moderate chance of fires starting. These fires are creeping or gentle surface fires. They are easily contained by ground crews with water pumps.

High. High chance of fire starting. These fires are challenging for ground crews to handle and heavy equipment (tanker trucks and aircraft) are often required to contain the fire.

Very High. Very high chance of a fire starting. These fires are fast spreading and are of high intensity. They are hard to control and require aircraft support.

Extreme. The environment is very dry and chances of fire are extreme. These fires are fast spreading, of high intensity and very difficult to control.



Advise cadets they can review this information for themselves by looking up the CFFDRS on the Internet for their area at <https://nofc1.cfsnet.nfis.org/mapserver/cwfis/index.phtml>.

Check for existing fire rings. Building a fire in a new spot all the time is damaging to the environment. Incorrectly built fires sterilize the soil below the fire, and it will take years before something can grow there again.

Food Storage Area

The food storage area should be a minimum of 60 m (200 feet) from the sleeping area. When possible, a food hang should be used.

Equipment Drying Area

A drying line should be put up within the sleeping area but not where members of the group could run into it or get caught up on it.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

- Q1. What should be taken into consideration when choosing a campsite?
- Q2. Describe the common campsite layout.
- Q3. Where is the best place to put the cooking area?

ANTICIPATED ANSWERS

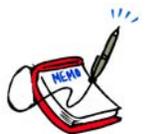
- A1. Absence of potential hazards, accessible water and space for tents should all be considered when choosing a campsite.
- A2. The common campsite layout includes the sleeping area, latrine/washroom, cooking area, fire area, food storage area and equipment drying area.
- A3. The best place to put a cooking area is on a durable surface such as a large flat rock or sandy area.

Teaching Point 2

Discuss Campsite Set-Up Routine

Time: 5 min

Method: Interactive Lecture



This TP details the process of elements of the campsite set-up when on expedition training.

Upon arrival at a suitable area, this process should be established to set up the campsite. All the cadets will have the opportunity to follow the process by delegating their peers to assist. Group work should be utilized whenever possible to keep the cadets active.

CAMPSITE SET-UP ROUTINE



The following is a sample routine that can be used when the cadets are tasked to lead a campsite set-up. These cadets will have selected the campsite and will delegate a section to complete the following tasks.

- All the cadets will set up their tents.
- Two cadets will locate and build a food hang.
- One cadet will identify and set up the cooking area and begin preparations for a meal.
- Two cadets will identify and set up the equipment drying area.
- Two cadets will purify water for cooking and drinking.
- Two cadets will gather firewood and set up the fire.
- One cadet will mark washrooms/latrines.

When these tasks have been completed, the entire section will gather for further instruction.

Organizing and Erecting Tents

The first step of the campsite set-up routine is to identify the sleeping area where the tents will be set up. Distinguish an area for males and females that is a minimum of 15 m apart. All the cadets should set up the tents upon arrival.



Erecting a tent was taught in EO M121.07 (Erect a Group Tent, A-CR-CCP-701/PF-001, Chapter 10, Section 7).

Setting up a Food Hang

Immediately upon arrival at the campsite, the food hang should be set up a minimum of 60 m (200 feet) from the sleeping area. A few members of the group should be tasked to set up the food hang so that everyone can hang their food bags when other tasks are completed.



The preferred method of constructing a food hang is:

1. Find a tree with a live branch a minimum of 10 cm (4 inches) in diameter.
2. Throw a weighted rope over the branch.
3. Pull about two-thirds of the rope over the branch.
4. Attach the food bag to one end of the rope and haul it up as high as possible.
5. Tie the loose end of the rope to the trunk of the tree.

To retrieve the bag, untie the end tied to the tree and lower the bag to the ground.



An alternate method of constructing a food hang is taught in C121.01 (Construct Field Amenities, A-CR-CCP-701/PF-001, Chapter 10, Section 10).



In established campsites, bear boxes or bear poles may be available to store food. When available, these are the preferred methods of protecting food.

Establishing a Cooking Area

The cooking area will remain the same during the entire time the group occupies the site. One or two cadets will be required to set up this area.

Setting up a Clothesline

A clothesline should be set up close to the sleeping area. Two cadets will be required to set up the clothesline.



If there is no drying area available, a drying rack can be constructed using the method taught in EO C121.01 (Construct Field Amenities, A-CR-CCP-701/PF-001, Chapter 10, Section 10).

Collecting Water

The best source of water will come from a fast moving stream. Avoid collecting water near livestock, human activity or from still water sources such as a small lake or pond. Muddy rivers are also poor sources of water.

Treat most water with suspicion. Boil the water for a minimum of 5 minutes adding 1 minute for every additional 300 m (1000 feet) in elevation. Whenever possible, use a water filter with micro-filtration systems to get rid of water-borne particles and viruses.



If the group plans to boil all collected water needed for the duration of the expedition, a greater amount of fuel will be required.

Gathering Firewood

It is best practice not to have a fire. Around highly-used campsites, most deadfall and downed trees have already been burned. It is getting increasingly difficult to find fallen wood to use in campfires. If this is the case, it likely means group members will have to forage further away from the site.

Starting a Fire

If using a fire, it should be started shortly before all other tasks are completed. Do not start a fire immediately on arriving at the site, as the fire will burn for no reason wasting valuable firewood.

Marking the Washrooms/Latrines

The washrooms/latrines should be marked using flagging tape and Glow Sticks before night falls. A good practice is to hang Glow Sticks when setting up the facilities and when dusk falls, a member of the group can activate the Glow Stick.

Cooking and Eating

A few group members should be assigned to oversee the cooking and other members of the group should clean up afterwards. Individuals will keep their food scraps with their garbage to keep the group waste smaller.



Hot water left on the stoves from meal time can be used for washing dishes or oneself later in the day. Water that has been used to cook Individual Meal Packages (IMPs) can be used for washing after the evening meal. It is important to ensure the water is used for washing only and not ingested.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

- Q1. What tasks are done immediately upon arriving at a site?
- Q2. Where is the best source of water?
- Q3. When is a fire started?

ANTICIPATED ANSWERS

- A1. Setting up tents and setting up a food hang are done immediately upon arriving at a site.
- A2. The best source of water is from a fast moving stream.
- A3. A fire is started prior to most of the routine tasks being completed.

Teaching Point 3

Discuss Campsite Routine

Time: 5 min

Method: Interactive Lecture



This TP is intended to give an overview of the elements of campsite routine when occupying a campsite.

Tasks should be divided among the cadets to follow the established routine that will be followed throughout the time the group occupies that campsite.

CAMPSITE ROUTINE

It is important that every member of the group understands campsite routine and its importance. It is important to have a campsite routine in order to maintain control, keep equipment organized and maintain the safety of every member of the group.

Ensuring Personal and Group Equipment is Always Organized

It is essential that all personal and group equipment be secured at all times. It is the responsibility of the individual to ensure that the equipment they have brought is in good repair and that they are aware of where it is. It is good practice to prepare for an exercise in advance. As an example, at dusk, retrieve the headlamp and any other equipment required to negate the task of going through packs in the dark.

Conforming to the Principles of Leave No Trace Camping

It is critical to ensure that the principles of Leave No Trace camping are followed. The Leave No Trace principles were covered in detail in EO M121.08 (Apply 'Leave No Trace' Camping, A-CR-CCP-701/PF-001, Chapter 10, Section 8). It is important to follow the Leave No Trace principles whenever training in the wilderness.

The principles of Leave No Trace camping are:

- Plan ahead and prepare.
- Travel and camp on durable surfaces.
- Dispose of waste properly.
- Leave what you find.
- Minimize campfire impacts.
- Respect wildlife.
- Be considerate of other visitors.

Cooking and Eating

All aspects of cooking and eating will be completed within the cooking area.

Before cooking or handling any food, be sure that the person washes their hands thoroughly.

If extra pots are available, put water on the stove immediately after the meal has finished cooking. This water can be used for making hot drinks later in the day.

Storing Garbage

Everything that goes into the field with the group, from socks to sunscreen, leaves the field with the group.

Keep track of individual garbage by storing it all in one bag. Keep the bag accessible within the pack in order to add to the waste whenever needed. This will negate putting apple cores and garbage into pack pockets. A bread bag or resealable plastic bag works well as a waste bag.



Ensure that all garbage is placed in the food hang at night.

Dealing With Food Scraps

Pay close attention to and retrieve any pieces of food that are dropped on the ground. This includes crumbs.

Food scraps, including leftovers, should never be buried. Animals will dig as soon as they smell it. This could happen before leaving the campsite.



Remember: Any and all food waste should be packed out.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS

- Q1. What does a campsite routine entail?
- Q2. What is the correct procedure for dealing with garbage?
- Q3. Why are food scraps not buried?

ANTICIPATED ANSWERS

- A1. Campsite routine entails:
- organizing individual and group equipment;
 - conforming to the principles of Leave No Trace camping;
 - cooking and eating;
 - storing garbage; and
 - dealing with food scraps.
- A2. The correct way to deal with garbage is to store it all in one re-sealable bag.
- A3. Food scraps should not be buried because animals will smell the scraps and dig them up.

Teaching Point 4

Discuss Campsite Departure Routine

Time: 5 min

Method: Interactive Lecture



This TP details a step-by-step process of the campsite departure when on expedition training or corps exercise.

The importance of having a routine is crucial here as there may be little time to complete the departure routine.

CAMPSITE DEPARTURE ROUTINE



The following is a sample routine that can be used when the cadets are tasked to lead a campsite departure. These cadets will delegate a section to complete the following tasks:

- All cadets will strike their tents.
- Two cadets will dismantle campsite amenities.
- All cadets will organize their personal equipment.
- Two cadets will purify water for drinking during travel.
- One cadet will dismantle the cooking area and remove any food waste.
- Two cadets will ensure fire is extinguished.
- One cadet will remove any markings from washrooms/latrines.
- One cadet will erase all signs of occupancy.
- One cadet and a staff member will conduct a final sweep.

When these tasks have been completed the entire section will gather for further instruction.

When leaving any campsite, the site should look like there was never anyone there. This includes biodegradable material like fruit and vegetable leftovers. These will still take a very long time to decompose.

Striking Tents

It is advisable to leave the tents up a little longer in the morning to allow any condensation/water to dry before packing up.

To remove a tent from the campsite, one must first strip the tent site of all components belonging to the tent. Importance should be placed on removing pieces of string or rope that are used to tie down the structure. The sleeping surface should be returned to its original appearance (replacing sticks and stones removed for sleeping). Remove any left over garbage.

Dismantling Campsite Amenities

If a clothesline or other amenities were built, they should be dismantled. Do not cut ropes and be sure to remove any rope from the tree entirely.

Organizing Personal Equipment

Personal equipment should be packed shortly after waking, to ensure the task is completed and equipment is organized.



Pack all individual sleeping equipment prior to leaving the tent.

Dismantling Food Hang

The food hang should be dismantled when packing up personal equipment to ensure that individuals have their food.

The immediate area of the food hang should be checked to ensure that no waste has been left behind.

Purifying Water

Two cadets in the section shall be tasked to purify water for all members of the group to ensure everyone has a full canteen. This will also serve as a time management activity while packing.

Cooking and Eating

All members of the group shall ensure they have eaten a meal relatively close to departure time and have packaged and put away all food waste.

Ensuring Fire is Fully Extinguished

Extinguish a small fire by burning all the wood down to ash, then saturating the ash with water and scattering the ash broadly away from the campsite. Use a stick to stir up the ash and water. Stop burning the wood long before the requirement to put it out.



“Night logs” are not necessary as they will most likely only be half-burned in the morning.

Organizing Group Equipment

Establish what equipment members of the group will be carrying. Sharing the load is advantageous for a few reasons: the weight is spread out, packs are less bulky and the group must communicate with each other in order to set up and tear down camp.

Erasing Signs of Occupancy

Easy steps to erase the signs of occupancy:

1. Dismantle secondary fire rings at established campsites.
2. Disperse rocks and other natural objects to their original position.
3. Fluff the grass where tents were and fill in tent peg holes.
4. Use a fallen pine branch to sweep the sand and dirt of any footprints.

Conducting a Final Sweep of the Area

Inspect the ground after all equipment has been packed to ensure nothing is hidden in the grass or buried. A final sweep of the area will include:

- checking tent areas;
- checking garbage has been picked up;
- ensuring latrine/washroom area is clean; and
- scattering ash once the fire is completely out by using a trowel.

If using a civilian campsite, try to make the site more appealing to users. This will keep them from going to find a ‘wilder’ site.

Pack out any garbage and waste that was left by previous campers.

CONFIRMATION OF TEACHING POINT 4

QUESTIONS

- Q1. When are the tents struck?
- Q2. Why should everyone understand the routine at a campsite?
- Q3. What is checked during the final sweep?

ANTICIPATED ANSWERS

- A1. Tents are struck in the morning after waking. If tents are damp, they can be left a bit longer to dry out.
- A2. Campsite routine should be understood by everyone to ensure that the campsite can be set up quickly and efficiently.
- A3. During the final sweep, the following items are checked:
- tent areas;
 - garbage has been picked up;
 - latrine/washroom area is clean; and
 - ash is scattered once the fire is completely out by using a trowel.

END OF LESSON CONFIRMATION

QUESTIONS

- Q1. What are some hazards to be considered when choosing a campsite?
- Q2. What activities are completed when setting up a campsite?
- Q3. What are the elements of a campsite departure routine?

ANTICIPATED ANSWERS

- A1. Hazards to consider are:
- fallen trees/branches,
 - poisonous plants,
 - insects, beehives and hornet's nests,
 - ant hills, and
 - animal dens.
- A2. The activities to be completed are:
- organizing and erecting tents;
 - setting up a food hang;
 - establishing a cooking area;

- setting up a clothesline;
- collecting water;
- gathering firewood;
- starting a fire;
- marking the washrooms/latrines; and
- cooking and eating.

A3. The campsite departure routine is:

- striking tents;
- dismantling campsite amenities;
- organizing personal equipment;
- dismantling food hang;
- purifying water;
- cooking and eating;
- ensure fire is fully extinguished;
- organizing group equipment;
- erasing signs of occupancy; and
- conducting a final sweep of the area.

CONCLUSION

HOMEWORK/READING/PRACTICE

N/A.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-703/PG-001, Chapter 3, Annex B, Appendix 7 (326 PC).

CLOSING STATEMENT

The ability to move from campsite to campsite in an efficient way is important as the cadets could arrive at a campsite late in the day with minimum light and have to leave early the next morning. The key to an efficient routine is work and time management. These skills will assist the cadets in corps exercises and expedition training.

INSTRUCTOR NOTES/REMARKS

Personal and group expedition equipment is outlined in PO 326 (Perform Expedition Skills).

The knowledge presented in this EO will enhance the cadets' participation in daily routine as part of the expedition training experience.

This EO has been allocated one period in the overall course period allocation. Each expedition centre may adjust this allocation to reflect the choice of activities, facilities and available resources at the expedition centre.

Timings for this EO will vary. While there is a requirement for some initial training, the focus should be on having the cadets practice hiking techniques through practical application.

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ROYAL CANADIAN ARMY CADETS

SILVER STAR

INSTRUCTIONAL GUIDE



SECTION 9

EO M326.07 – RECORD ENTRIES IN A JOURNAL

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-703/PG-001, 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 Annex A and distribute to each cadet.

PRE-LESSON ASSIGNMENT

N/A.

APPROACH

An interactive lecture was chosen for TPs 1 and 2 to introduce the journal and present background information.

A practical activity was chosen for TP 3 as it is an interactive way to provoke thought and stimulate interest in the journal.

INTRODUCTION

REVIEW

N/A.

OBJECTIVES

By the end of this lesson the cadet shall have recorded entries in a journal during expedition training.

IMPORTANCE

It is important for cadets to understand the importance of recording entries in a journal, especially during expedition training. Completing entries in a journal records the cadet's involvement, not just their participation in the training. These entries provide a link between the knowledge learned throughout training and the direct experiences the cadet had.

Teaching Point 1**Discuss Journals**

Time: 5 min

Method: Interactive Lecture



This TP will take place in the evening while at the Expedition Centre. Team Instructors (TI) should ask the cadets to reflect on their previous experiences using journals.

Discuss how the cadets feel about previous experiences using a journal.

The cadets will be required to record entries in the journal during the evenings at the expedition centre.



When completing Leadership and Challenge, senior expeditions and international expeditions, cadets are required to keep a journal.

DIFFERENCE BETWEEN A JOURNAL, LOG AND RECORD BOOK

Journals, logs and record books are methods of recording information. Each records information about the expedition experience, from a different perspective.

Journals. Record personal thoughts, reactions to experiences, personal learning, and the participant's awareness of what happened in an experience. They are forms of expression that provide an avenue for reflection that is much different than speaking. Journals help people reflect on self-discovery, group dynamics, sense of place and professional development. They do not have a set format and can be a creative expression of the writer tying together experience and learning.

Some people who are reluctant to speak in front of a group find journals provide a place to express what is on their mind. Journals help open the thought process for some individuals, allowing them to speak freely about their entries at a later date.

Log. Logs are a written record of facts and events on a trip or activity. Logs contain information on what activities were accomplished and any incidents that took place. Logs also record factual information such as distance travelled, weather conditions, flora, fauna, wildlife encounters and campsite locations.

Logs are more formal forms of record keeping than journals and can often serve as legal documents in emergencies and critical incidents.

Record Book. A structured, fill-in-the-blanks document used to record the completion of specific training, skills and depth of experience.

THE PURPOSE OF JOURNALS

The purpose of journals is to allow the participant to record thoughts, feelings and experiences that allow the individual to grow and develop as a person.

TYPES OF JOURNALS

In addition to an individual's reflective journal, there are other journals which can be used in training. Examples of these are:

Group Journals. This type of journal is shared among participants. Each person takes a turn logging their impressions, thoughts and experiences. A person may also comment on someone else's entry. This type of

journal assists in fostering group cohesion and creativity. Issues may be brought to the attention of the whole group or used as topics during group reflection.

Project Journals. This type of journal has entries that are related to a future project to be accomplished by an individual or by the entire group. It is often used for long-term experiences and provides participants the opportunity to reflect on the process of working on a project.



Have the cadets brainstorm instances when each type of journal could be used.

JOURNAL ENVIRONMENT

The environment in which entries are recorded in a journal is of the utmost importance. In general, the journal environment should:

- provide each cadet with a minimum of 20 uninterrupted minutes;
- account for cadets who will require more than 20 minutes to complete an entry (eg, no training should be completed directly after);
- provide each cadet enough space to be free from other cadets; and
- allow each cadet to express their thoughts wherever they wish within a given set boundaries.



Journals should be thought of as public documents. References that are made to or about other people must be made in a respectful and positive manner.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

- Q1. What is a journal?
- Q2. What is a log?
- Q3. What is a project journal?

ANTICIPATED ANSWERS

- A1. A journal records personal thoughts and reactions to experiences and personal learning, and creates awareness of what happened in an experience. It is a form of expression that provides an avenue for reflection that is much different than speaking. Journals help people reflect on self-discovery, group dynamics, sense of place and professional development.
- A2. A log is a written record of facts and events on a trip or activity. Logs contain information on what activities were accomplished, and any incidents that took place. Logs also record factual information such as weather conditions, flora, fauna, wildlife encounters and campsite locations.
- A3. This type of journal has entries that are related to a future project to be accomplished by an individual or by the entire group.

Teaching Point 2**Describe a Journal**

Time: 10 min

Method: Interactive Lecture



The Silver Star expedition journal uses both journal and log information in order to train cadets on the functions of recording information.

The purpose of the Silver Star expedition journal is threefold:

1. The journal will provide cadets with a training experience where they will take time to record personal experiences.
2. The journal will serve as a record of the cadets involvement in local expedition training. It will provide the link between the Army Cadet Program and their expedition experiences.
3. The journal will familiarize cadets with a new tool for their lives.

IMPORTANCE

Historically, logs and journals recorded a journey. Since then, they have been widely adopted among educators as a means of documenting personal development. The importance of a journal is to record activities and provide a chronological record of one's outdoor experiences which can serve as a tool for reflection on experience. The silver star expedition journal introduces elements of logs and journals.

INFORMATION REQUIRED IN THE SILVER STAR EXPEDITION JOURNAL

Information required in the journal includes:

Day and Date. The day of the trip. (eg. Day 2 of a 2 day trip) and the calendar date.

Mode of Travel. Record the mode of travel. How is the group travelling? Is the group hiking, biking or canoeing?

Time. Record the time the group woke up and went to bed. This will give a record of how long the days were. Record the start and finish time of the activity. This will be useful when debriefing and completing any reports required. It will also give an accurate estimate of the time required to make the trip at a given time of year (eg, canoeing in the spring will be faster than in the fall due to the melting snow).

Start and End Location. Record the start and end locations for the day. This should be a precise grid reference but can also be a description of the area.

Distance and Campsite Grid Reference (GR). The total distance travelled throughout the day and the grid reference of the campsite for the night.

Route Travelled. A chart with columns for the name of the trail or route, time it took to complete the section, how many kilometres the route was and a physical description of the route. The description could include any sections on the route that were difficult, if there were obstacles on sections, and the state of the trail.

Campsite Description. A description of the campsite and the area surrounding it. Does it require maintenance? Are there any special characteristics about it? Sufficient number of tent sites?

Weather. A written description of the weather including the temperature, cloud cover, wind speed, direction and a prediction for the short term.

Personal Goals. This is the place to set personal goals for the day and for the next day or few days.

Where Can I Use This Training? Is the training useful? Will the training be used in the future? Record where the training could be used and how it will benefit you.

Best Thing of the Day/Worst Thing of the Day/My Best Moments. A short description of the best and worst parts of the day and feelings felt.

Personal Reflections and Observations. Include anything with regard to the trip itself. Notes on weather, animals, and significant events can also be added. This is also a great place to record recurring themes and assess personal involvement. Incorporate any personal reflections or other observations not covered in other sections.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

- Q1. Why are journals so important?
- Q2. What is recorded in the times section?
- Q3. What goes into the personal reflections section?

ANTICIPATED ANSWERS

- A1. The importance of a journal is to record activities and provide a chronological record of one's outdoor experiences which can serve as a tool for showing a person's depth of experience.
- A2. The times section records time the group woke up and went to bed. This will give a record of how long the days were and the start and finish time of the activity. This will be useful when debriefing and completing any reports required. It will also give an accurate estimate of the time required to make the trip at a given time of year (eg, canoeing in the spring will be faster than in the fall due to the melting snow).
- A3. The personal reflection section is for any observation or thoughts not recorded in any other section.

Teaching Point 3

Have the Cadets Record Entries in a Journal During an Expedition

Time: 10 min

Method: Practical Activity

ACTIVITY

OBJECTIVE

The objective of this activity is to familiarize the cadet with the Silver Star Expedition Journal. During expedition training cadets will make two entries in their journals.

RESOURCES



A variety of resources may be used during this activity. The writing and marking materials are not limited to this list.



There are many pages to the journal, although only the structured information page is covered within this lesson. The remainder of the journal is for free flowing thought.

- Silver Star Expedition Journal located at Annex A, and
- Pencils/pens.

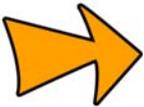
ACTIVITY LAYOUT

N/A.

ACTIVITY INSTRUCTIONS

TIs will facilitate the journal activity as a group while cadets record comments into their own journals.

1. Distribute a journal located at Annex A to each cadet.
2. Have each cadet read and become familiar with the journal. Introduce the journal, which includes:
 - a. a front page;
 - b. a page of possible ideas that will provoke thoughts for writing during training;
 - c. daily pages (one of which is to be completed each day following completion of training);
 - d. one extra page to be used after the expedition for any final thoughts or ideas that occurred throughout or after training; and
 - e. a page for sketches, to be completed after expedition training.
3. Have the cadet record entries.



Within the journal, the page of possible ideas should be used as a guide, especially if a cadet is experiencing difficulty deciding what to write. Each entry should have a common theme.

SAFETY

N/A.

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 recording entries in a journal will serve as the confirmation of this lesson.

CONCLUSION

HOMEWORK/READING/PRACTICE

N/A.

METHOD OF EVALUATION

This EO is assessed IAW A-CR-CCP-703/PG-001, Chapter 3, Annex B, Appendix 7 (326 PC).

CLOSING STATEMENT

Recording entries in a journal is a way for the cadets to express themselves and reflect freely, without speaking. There will always be individual differences within every group and a journal allows the cadets to express themselves using a variety of means. After expedition training, all the cadets will be given time to reflect on their expedition experiences.

INSTRUCTOR NOTES/REMARKS

The cadet will make two entries in the journal while at the expedition centre.

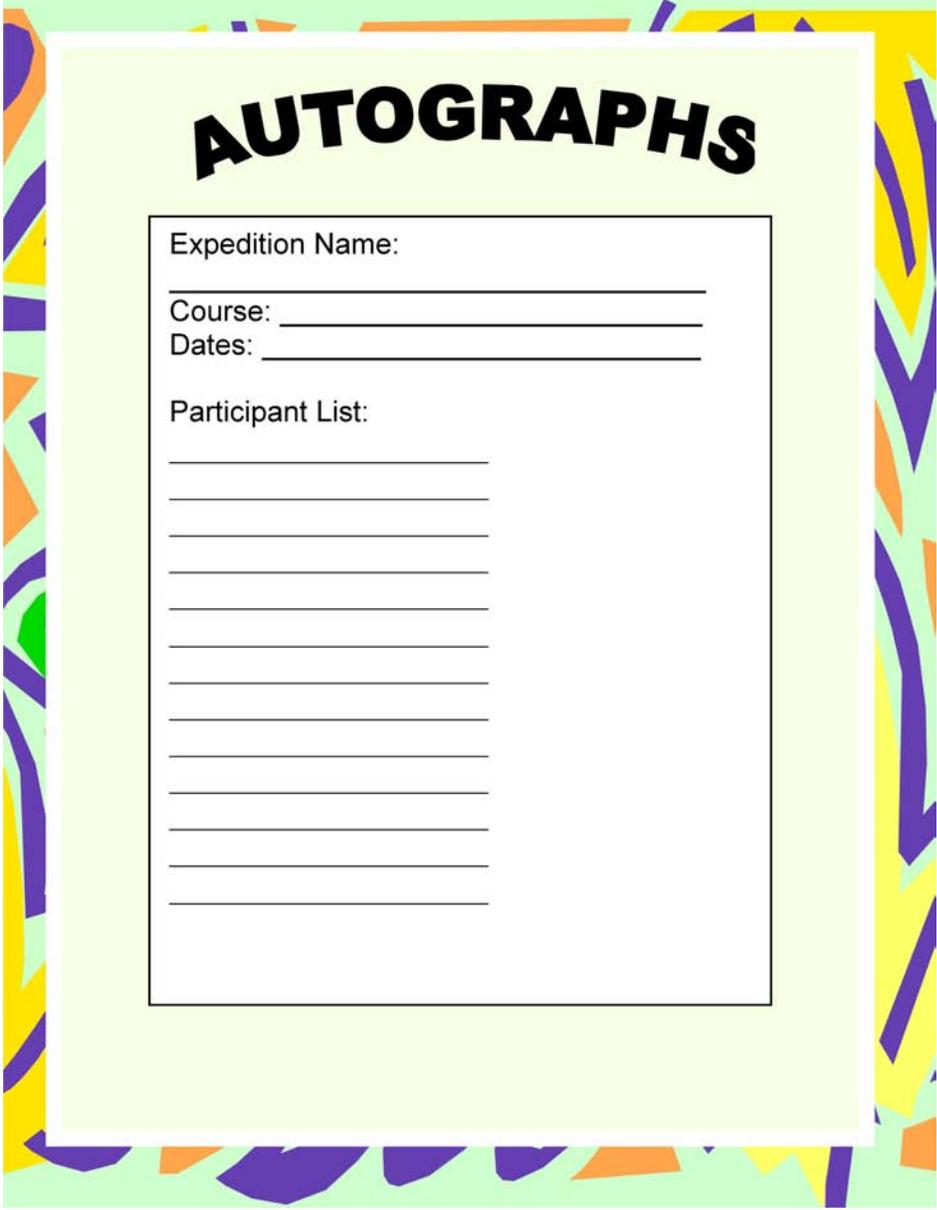
This EO has been allocated one period in the overall course period allocation. Each expedition centre may adjust this allocation to reflect the choice of activities, facilities and available resources at the expedition centre.

REFERENCES

C2-109 (ISBN 0-7872-6561-6) Sugerman, D., Dohery, K., Garvey, D., & Gass, M. (2000). *Reflective Learning: Theory and Practice*. Dubuque, IO: Kendall/Hunt Publishing Company.

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SILVER STAR EXPEDITION JOURNAL



AUTOGRAPHS

Expedition Name: _____

Course: _____

Dates: _____

Participant List:



Individual Trip Journal

1. Day: _____ Date: _____
Mode of Travel (canoe, bike, hike): _____

2. Time: Wake up: _____ Bedtime: _____
Time: On Route: _____ Off Route: _____
3. Start Location: _____
End Location: _____
4. Distance: _____ Campsite GR: _____
5. Route Travelled: _____

Name of Route (trail, lake, river, portage)	Time	Km	Description

6. Campsite Description:

7. Weather:

8. Personal Goals:

9. Where can I use this training?:

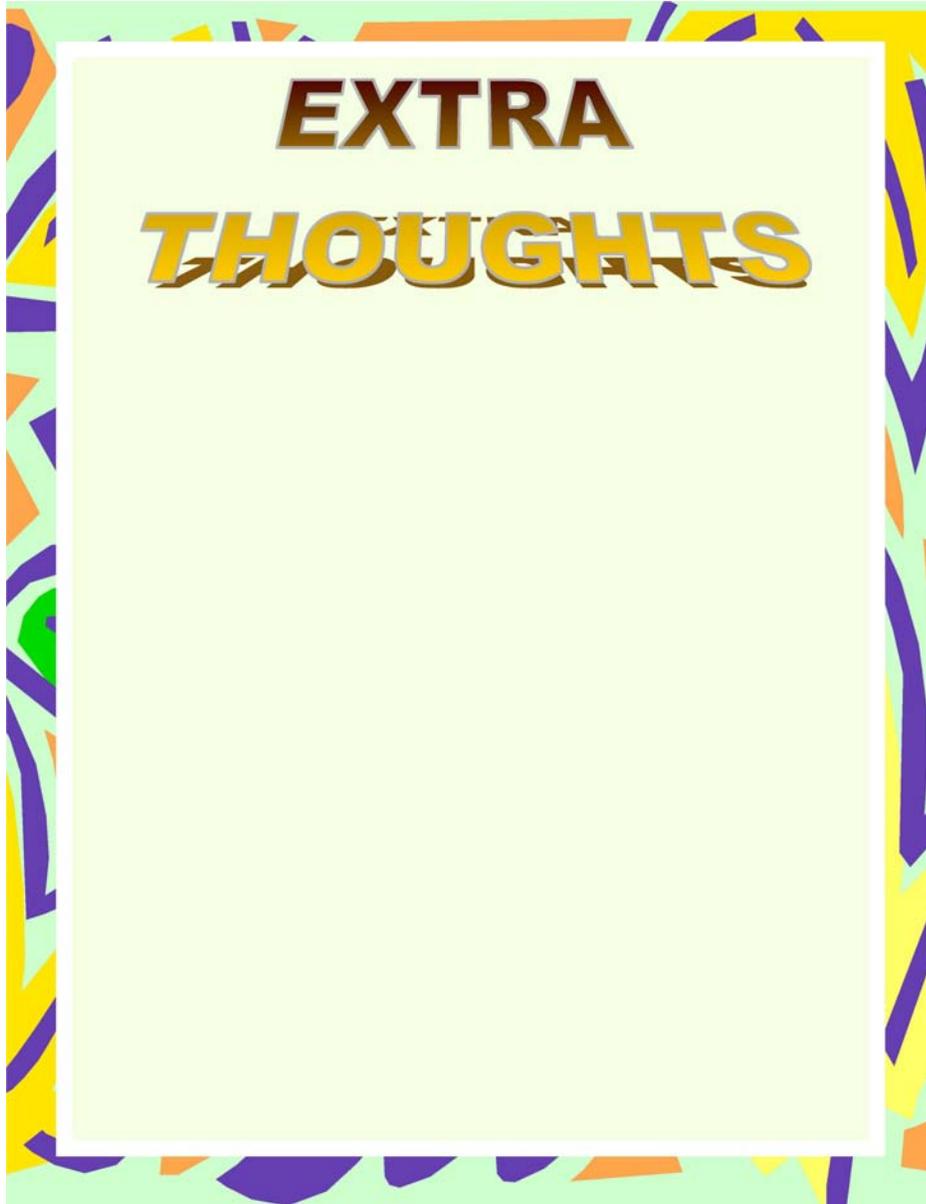
10. Best Thing of the Day/Worst Thing of the Day, My Best Moments:

11. Personal Reflections and Observations (natural environment, leadership, personal involvement, recurring themes):

(Copy enough pages for each day of the expedition activity)

Possible ideas:

- Feelings that occur on an expedition,
- Thoughts on leadership during an expedition,
- Feelings about acting as a leader,
- Seeing peers act as a leader,
- Leadership of the staff,
- Accomplishments at the end of the day,
- Challenges,
- Barriers or conflicts the group is facing,
- Teamwork when canoeing,
- Navigation and hiking,
- Mountain biking,
- Concern about the activities for tomorrow,
- Responsibility to peers,
- Responsibility to the environment,
- Learning from mistakes,
- I could be doing something different with my summer,
- The importance of teamwork on an expedition,
- Future opportunities at the corps, and



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