ROYAL CANADIAN AIR CADETS

PROFICIENCY LEVEL ONE

INSTRUCTIONAL GUIDE

SECTION 11

EO C190.04 – COLLECT DRINKING WATER IN THE FIELD

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-801/PG-001, *Proficiency Level One Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

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

Prepare a suitable instructional area.

Prepare examples of water collection devices.

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TP 1 to orient the cadet to conserving water and generate an interest in the subject.

A demonstration and performance was chosen for TP 2 as it allows the instructor to explain and demonstrate collecting drinking water and provides an opportunity for the cadet to practice the skill under supervision.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall have collected drinking water in the field.

IMPORTANCE

Cadets will obtain the skills to collect water in a survival situation. Water is vital to human survival. Without sufficient drinking water the body with shut down and eventually die. Having sufficient drinking water combats thirst, which is an enemy of survival.

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Teaching point 1 **Describe the importance of water conservation and retaining fluids.**

Time: 15 min Method: Interactive Lecture

OVERVIEW

The human body consists of 75% water. It is required to keep kidneys functioning so they may eliminate wastes, control body temperature, and regulate the nervous system.

Water is essential to life. All living things contain water and depend on it. The average person can survive for approximately three weeks without food but only three days without water. Do not wait until water supplies have completely diminished to find a water source. When faced with a survival situation, conserve water and find a source as soon as possible. The source should be fresh, running water though. However, boiling or the use of chemical purifiers can sterilize water.

When water is lost from the body it must be replaced to maintain health and efficiency. The human body loses two to three litres of water per day, which must be replaced to maintain the water balance. This water replacement occurs by consuming actual water or water that is contained in food.

DEHYDRATION

The human body has no means of storing water like it can with food fats. When the body is deprived of water it becomes dehydrated, which can affect it in very negative ways.

Effects of Water loss:

Loss of 1–5% Body Water	Loss of 6–10% Body Water	Loss of 11–12% Body Water
Thirst	Headache	Delirium
Discomfort	Dizziness	Swollen tongue
Lethargy	Dry mouth	Twitching
Impatience	Tingling in limbs	Deafness
Lack of appetite	Blue shade to skin	Darkening vision
Flushed skin	Slurred speech	Lack of feeling in the skin
Increased pulse	Difficulty breathing	Skin starts to shrivel
Nausea	Inability to walk	Inability to swallow
Weakness	Blurred vision	Death

RETAINING FLUIDS

The following precautions can be taken to keep fluid loss to a minimum:

- Avoid exertion.
- Do not smoke.
- Keep cool, stay in the shade.
- Do not lay on the hot ground or heated surfaces.
- Eat as little as possible – If there is little fluid in your body, water is taken from the vital organs to digest the food.
- Avoid speech.
- Breathe through the nose, not the mouth.

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CONFIRMATION OF TEACHING POINT 1

QUESTION:

Q1. What percentage of the human body is water?

Q2. How much water does the human body lose each day?

Q3. What are three ways to prevent water loss?

ANTICIPATED ANSWERS:

A1. Seventy-five per cent.

A2. Two to three litres.

A3. Avoid exertion, do not smoke, keep cool, stay in the shade, do not lay on the hot ground or heated surfaces, eat as little as possible, avoid speech, and breathe through the nose, not the mouth.

Teaching point 2 **Explain, demonstrate and have the cadets collect drinking water.**

Time: 40 min Method: Demonstration and Performance



For this skill lesson, it is recommended that the 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 required to monitor the cadets' performance.

COLLECTING WATER

Rain Water

Set out a container to collect any rain that may fall. The flow from the roof of a shelter can be collected using improvised guttering to channel the rain into containers. Rainwater requires less purification than a standing body of water. Collecting rainwater is also easier than other collection methods.

Stretch a plastic bag / poncho tightly over a wide area, preferably on a slope. Peg down its corners with sticks and collect the rain in a container. A rock may be used to weigh down the centre and better direct the water into the container. When waterproof sheets are unavailable, use birch bark sheet and shape it to channel the water into a container.

Note. From The Complete Wilderness Survival Manual by Hugh McManners, 1994, Toronto, ON: McMillan Canada.

Figure 1 Rain Collector

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DEW

As the air cools down at night, the water vapour in the air condenses as dew on low-lying ground, and vegetation. This water evaporates rapidly as the sun rises. Many plants, insects and animals depend upon dew to survive. Humans can also make use of this natural water supply. Dew can be collected by soaking a cloth in long wet grass. The best time for collection is at dawn. When the cloth is soaked, wring the water out into a container. If a cloth is unavailable, a spare t-shirt or other piece of clothing may be used.

Note. From The Complete Wilderness Survival Manual by Hugh McManners, 1994, Toronto, ON: McMillan Canada.

Figure 2 Dew Collection

Water from Vegetation

Tie a plastic bag over a healthy, bushy green branch. The water vapour given off by the foliage heats up inside the plastic and condenses to form water inside of the bag. On trees, keep the mouth of the bag at the top with a corner hanging low to collect condensed evaporation.

Note. From The SAS Survival Handbook, by John Wiseman, 1999, London, England: HarperCollins Publishers.

Figure 3 Collecting Condensation

An entire plant can also be used as a water source. Placing a plastic bag over any vegetation collects moisture by evaporation. The moisture condenses on the plastic as it cools. Suspend the bag to an overhead tree branch, or place a wide stick on the inside to prop up the plastic bag. Arrange points for the water to collect.

Note. From The SAS Survival Handbook, by John Wiseman, 1999, London, England: HarperCollins Publishers.

Figure 4 Collecting condensation from plants

There are many different types of vegetation that store water in either their leaves or roots. Some types of vegetation capture rainwater to trap insects for food. Others secrete special fluids that can be tapped and drank by humans in emergencies. Some examples include: pitcher plants, cacti, tree roots and vines.

Note. From The Complete Wilderness Survival Manual by Hugh McManners, 1994, Toronto, ON: McMillan Canada.

Figure 5 Pitcher Plant

Note. From Camping and Wilderness Survival: The Ultimate Outdoors book by Paul Tawrell, 1996, Green Valley, ON: Author

Figure 6 Cactus

Solar Still

Water can be extracted from soil using a solar still. As long as there is a difference in temperature in between two surfaces, air between those surfaces heats up and becomes saturated. The air condenses as droplets on the cooler surface.

To construct a solar still dig a hole about three feet wide and two feet deep. Place a collecting can at the bottom of the hole. Spread a plastic sheet across the hole and hold it in place with rocks. Weigh down the centre of the sheet over the container with a fist-sized rock. As the temperature of the air and soil rise, water

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vapour condenses on the underside of the cooler sheet and runs into the container. Dig another hole when the moisture in the hole / still has been used up.

Note. From The Complete Wilderness Survival Manual by Hugh McManners, 1994, Toronto, ON: McMillan Canada.

Figure 7 Solar Still

Digging for Ground Water

Water often seeps into a hole dug in a location where the water table is high. Dig a hole about one foot deep. Water seeps from the ground into the hole. The water is dirty the first few times the hole fills, but clear water eventually rises and can be purified and drunk. Keep scooping away the muddy water until clear water rises. Note the surroundings before a water hole has been dug. Never dig where the mud has a potent smell or a green slime on the surface. This water is probably contaminated. Do not collect water where there are dead animals and always purify the water before drinking.

ACTIVITY

Time: 20 min

OBJECTIVE

The objective of this activity is to have the cadets make a water collection device.

RESOURCES

- Plastic bags / sheets of plastic (one per group).
- Shovels (one per group).
- Pegs (one per group), and
- Cup or bowl (one per group).

ACTIVITY LAYOUT

Nil.

ACTIVITY INSTRUCTIONS

- Divide the cadets into groups of three or four.
- Assign each group a water collection device to set up.
- Cadets are to construct the water collection device as per instructions given during the lesson.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What are some surface characteristics to look for when searching for a water source?

Q2. How can insects help find a water source?

Q3. What is a method of collecting water?

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ANTICIPATED ANSWERS:

A1. Follow dry riverbeds. The structure and composition of the rocks may result in a stream emerging. The riverbed may be followed to its source. There may be a trickle of water that remains or humid soil is present where a pit can be dug to the water table. Watch for damp spots on the ground. A high water table can cause this. Old human habitations can be a good place to find water. Old mines and dumps are good examples. Water may be collected from dew accumulation.

A2. Insects live within flying distance of water. Their flight path may be followed to a water source.

A3. Rain collection, dew collection, water from vegetation, solar still, and water from the ground.

END OF LESSON CONFIRMATION

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

CONCLUSION

HOMEWORK / READING / PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Cadets have learned the effects of water on the human body, how to find water and how to collect it. Water is vital to human survival; without sufficient drinking water the body shuts down and eventually dies. Having sufficient drinking water combats thirst, which can be an enemy of survival.

INSTRUCTOR NOTES / REMARKS

The directives outlined in CATO 11-08 *Environmental Protection and Stewardship* are to be adhered to during this training.

This lesson should be scheduled at the start of the morning with the cadets setting up their water-collection devices. Follow up should take place the next to indicate the cadets' water-collecting devices worked.

REFERENCES

C3-002 ISBN 0-00-653140-7 Wiseman, J. (1999). *The SAS survival handbook*. Hammersmith, London: HarperCollins Publishers.

C3-003 ISBN 1-896713-00-9 Tawrell, P. (1996). *Camping and wilderness survival: The ultimate outdoors book*. Green Valley, ON: Author.

C3-021 ISBN 0-7715-9035-0 McManners, H. (1994). *The complete wilderness survival manual*. Toronto, ON: McMillan Canada.

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