ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 1

EO M121.01 – SELECT PERSONAL 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-701/PG-001, *Green Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

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

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

The group discussion was chosen for TP 1 as it allows the cadets to interact with their peers and share their knowledge, experiences, opinions and feelings on what needs to be considered when selecting clothing for an outdoor activity. Sharing in the group discussion encourages the cadets to examine their own thoughts and may prompt them to re-think their previously held ideas. Participating in a group discussion improves the cadets' listening skills and team development.

An interactive lecture was chosen for TPs 2 – 4 to introduce the cadets to the types of sleeping bags and additional items required for an outdoor activity.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadets shall be expected to select appropriate personal equipment for participation in a field training exercise (FTX). Cadets shall be able to identify the layering system, choose suitable clothing for the weather conditions, select sleeping equipment, and identify additional items that may be required for a FTX.

IMPORTANCE

Understanding the basic requirements of personal equipment for a FTX will allow the cadets to be prepared for the weather conditions, to be comfortable in their environment, and to prepare themselves for participation in upcoming exercises.

Teaching Point 1 **Explain considerations when selecting clothing for an outdoor activity.**

Time: 20 min Method: Interactive Lecture

LAYERING SYSTEM

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

Principles of Layering

Temperature control

- The temperature of air around the body will heat and cool according to the:
  - amount of activity being conducted,
  - ambient temperature,
  - weather changes and time of day (i.e., wind, rain, snow), and
  - altitude.
- The simplest way to control such temperature changes of the body is through effective layering.

Insulation

- Insulation slows the rate of heat transfer. The warmth of a garment may be considered as its ability to hold heat. The more heat it can hold over time, the more slowly it transfers heat away from the body, and the warmer the garment is.
- The ideal insulation would weigh next to nothing, be as thin as a tissue, and be compressible down to a tiny volume.

Materials

Synthetic Materials	
Polypropylene	• Man made fabric with many properties of wool • Relatively inexpensive • Same material as milk bottles • Base layer
Polyester	• High resilience and loft • Light weight • Clean, odourless and non-allergenic • Will not develop mildew
Acrylic	• Not often used • Good insulating properties • Inexpensive • Wears well

Tyvek	• Not very durable • Doesn't breath
Coolmax	• A patented polyester fabric • Great wicking properties • Base layer
Gore-tex	• Wind and water resistant • Limited breathability • Outer layer
Thermax	• Fine weave polyester • Dries quickly • Base layer

Natural Fabrics

Cotton	• Absorbs and holds moisture • Poor material for base layer • Can lead to hypothermia (cotton stores moisture, when cooled the body cools). • May be worn as an insulating layer a sweater
Wool	• Doesn't absorb moisture • Retains insulation properties when wet • Best used as insulation
Silk	• Great insulating characteristics in very thin fabrics • Very comfortable next to skin • Somewhat fragile (must be laundered and dried carefully)

Types of Layers

Layering allows a person to micro adjust the immediate climate next to the body. This layering structure can be broken into three groups.

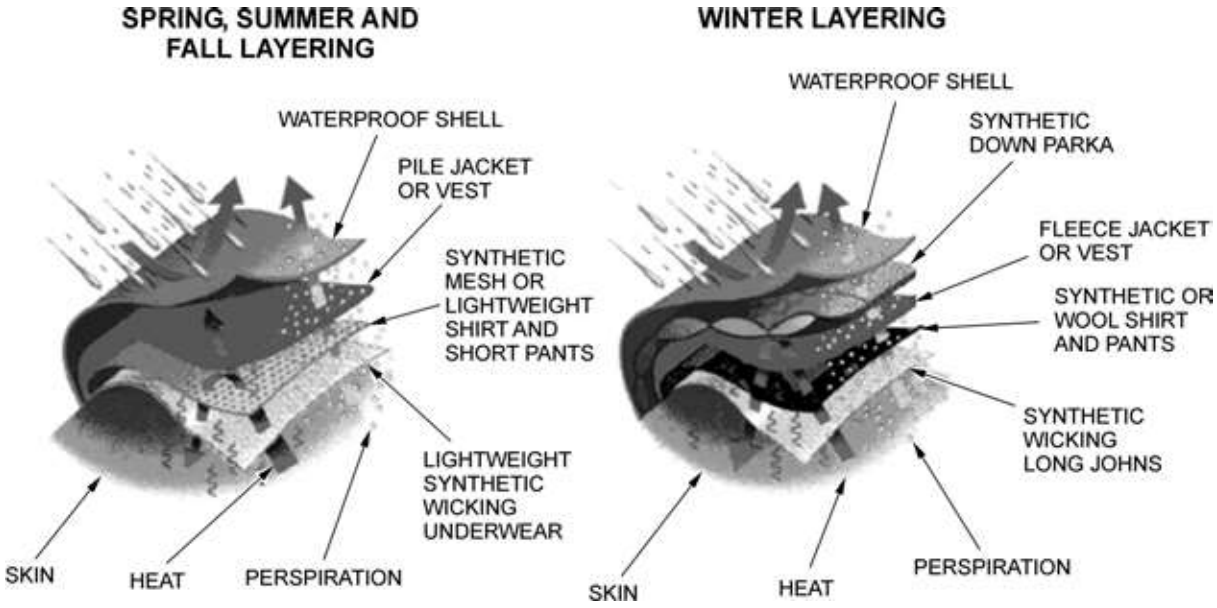
Base Layer. This layer actually touches the skin. During hiking, paddling or climbing, the body sweats to cool itself. As the base layer comes in direct contact with your skin, it must be a material that keeps the body warm even when wet. This layer should transport moisture away from the skin and disperse it to the air or outer layers where it can evaporate. This is known as wicking (i.e. wicking layer). The best base layer materials are synthetics, **polypropylene** and **polyester**. These materials are available in three different weights, all containing the same characteristics as listed below.

- Types
  - Light weight – suits high aerobic activity where sweat distribution is greatest.
  - Medium weight – provides moisture control and insulation for stop-and-go activities.
  - Heavy weight – best in cold conditions, or when relatively inactive.
- Characteristics
  - Light and strong
  - Absorbs very little water
  - Quick to dry

Remember water (sweat) is a good heat conductor. Damp clothes draw heat from the body, even in conditions above freezing. This rapid heat loss can cause a dangerous drop in the body's temperature.

Insulating layer. This is the mid-layer that provides insulation and continues the transportation of moisture from the inner layer. To slow heat loss, this layer must be capable of retaining the warmth generated by the body. This is accomplished by the structure of the fibres creating small air spaces that trap molecules of warm air. Additional features, such as pit zippers and full-length front zippers, allow venting. As with the inner layer, this layer should be snug but not constricting.

Outer Layer. The wind breaking and / or waterproof shell is the outer layer that protects a person from the elements and should allow air to circulate and excess moisture to escape. For dry conditions, a breathable (uncoated) wind shell or a smooth-surfaced soft shell may be all that is needed. If expected conditions are more severe, a waterproof (coated) rain jacket maybe more effective. A shell made of a breathable and waterproof fabric protects from wind and rain, and allows water vapour to escape.



Hiking and Backpacking, A Complete Guide, by Karen Berger, 1995

Figure 1 Layering

DRESSING THE BODY

There are many ways to dress for most activities. Being warm and dry allows you to concentrate on, and enjoy, the activities being conducted. Insulating thickness is a determined variable based on the activities being

conducted and then adjusted to fit the particular circumstance. Employing the layering method is the best way of controlling body temperature.

Remember:

- It is much easier to stay warm than to try to warm up after getting cold.
- It takes much 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.

A choice must be made as to what clothing will best suit the environmental conditions for a particular body part. There are many parts to consider and many types of clothing to take into account. The following is a list of clothing items for the various parts of the body:

Head and face

- Toque / cap
- Balaclava
- Tilley cap
- Parka hood
- Face mask
- Scarves

Trunk

- Undershirt
- Shirt
- Sweater
- Vest
- Jacket
- Parka

Neck

- Turtleneck
- Neck Gaiter
- Scarves
- High Collar
- Parka Hood

Legs

- Pants
- Insulted pants
- Windbreaker

Hands

- Gloves
- Mittens

ACTIVITY

Time: 15 min

OBJECTIVE

The objective of this activity is for the cadets to gain an understanding of the garments required for a day hike or FTX, taking into consideration the weather conditions expected.

RESOURCES

- Scenarios: Cold weather, wet weather, and hot weather.
- Flip chart paper, and
- Markers

ACTIVITY LAYOUT

Arrange the room for cadets to work in small groups.

The following instructions are suggested:

- Split the cadets into groups of four to six cadets.
- Provide a form of recording material (flip chart and markers)
- Give each group one of the following topics 1) Cold Weather Wear, 2) Wet Weather Wear, 3) Warm Weather Wear.
- Provide the cadets with the details of an upcoming unit exercise.
- Have cadets produce a list of required clothing to suit the environmental condition they were assigned.

ACTIVITY INSTRUCTIONS

- Divide the cadets into at least three groups.
- Provide each group with a different scenario. If there are more than three groups, two groups or more may work on a similar scenario.
- Have the cadets develop a list of clothing articles that will be required for the presented scenario.
- Have the cadets present their list to the rest of the class.
- Allow cadets from other groups to discuss the lists that were developed.

SAFETY

Nil.

CONFIRMATION OF TEACHING POINT 1

QUESTION:

Q1. What layers make up the layering system?

Q2. What is the best base layer material?

Q3. Give an example of a natural fibre.

ANTICIPATED ANSWERS:

A1. Base layer, insulating layer, outer layer.

A2. Polypropylene.

A3. Silk, wool, cotton.

Teaching Point 2 **Discuss the considerations for selecting a sleeping bag for an outdoor activity.**

Time: 10 min Method: Interactive Lecture

INSULATING MATERIAL

Sleeping bag insulation is divided into two categories, natural and synthetic.

Natural insulation is usually waterfowl down – the short feathers closest to a duck's, or goose's, body that insulate the animal when in cold water. There is a variance in quality of down and the methods used to secure it in place inside the bag's inner and outer shell. Down sleeping bags are measured according to their fill-power

(FP) cubic inches per ounce of down. A good quality down-blend is around 550 FP. Look for a bag with good quality down with the insulation held in place by “baffles” – dividers sewn between the two shells that keep the down in place. Down is the warmest and lightest insulation that can be found in a sleeping bag; however, it loses almost all of its heat retaining ability when it gets wet and it is very difficult to dry in the field.

Synthetic insulation is comprised of plastic threads that are either continuous long filaments or short staples (pieces about five centimetres long) and may be hollow. Short staples may be a mixture of thin and thick pieces. Thinner, lighter threads fill voids and trap warm air effectively while providing loft and durability.

Some bags offer more insulation on the top than on the bottom. Avoid bags where the insulation is secured by sewing the two shells together creating seams where there is no insulation. Most synthetic insulation retains its insulative value when wet. Some synthetics are very light and warm – they make a better all-round choice than down for a general purpose sleeping bag. In sleeping bags, cost often is a good indicator of the quality of the bag.

SLEEPING BAG CONSTRUCTION

Methods

 *www.mec.ca/main/content*	 *www.mec.ca/main/content*	 *www.mec.ca/main/content*	 *www.mec.ca/main/content*
Sewn-through is used in lightweight or warm-weather synthetic or down bags, but can have cold spots at quilt lines.	**Offset Quilt** is used for synthetic bags only. It has no cold spots at quilt lines and is less expensive than shingled construction.	**Shingles** are used for synthetic bags only. It is the most warmth-to-weight efficient construction, but is more expensive than offset quilt.	**Baffles** are used in down bags only. They feature mesh partitions at quilt lines to prevent cold spots and keep down from migrating through the bag. Expensive, but very warm.

Sleeping bag parts

Outer shell – constructed from a lightweight fabric, often nylon or polyester. It should be of sufficient weight and quality to protect the insulation layer.

Inner shell – constructed from a lightweight fabric. Look for an inner shell that does not retain moisture. Many inexpensive bags use cotton / flannel inner shells, which are comfortable, but not ideal for a hiking or expedition bag, as cotton takes too long to dry.

Hood – a part of the main bag that can be pulled around your head in cold weather. This keeps your head warm without a build up of moisture from your breath in the bag.

Liner – a thin bag you place inside your main bag to help keep the main bag clean and to offer a little more insulation.

Over bag – a durable bag placed over your main bag to protect the outer shell, and to offer more insulation. Over bags made from waterproof and waterproof-breathable material can be used as mini-shelters. There are

several good designs of these “bivi-bags” that have screened openings to protect your face from bugs and to allow some ventilation in warm weather.

TYPES OF SLEEPING BAGS

The choice of a sleeping bag has a lot in common with the personal choice of outdoor clothing. It must be the right size (length and width), have the appropriate amount of insulation for the coldest expected temperature, be made of a material that breathes and doesn’t retain moisture, and have a good quality fastener (zipper).

When choosing a sleeping bag, check the bag size by getting in and moving around. There should be some space for a liner and extra clothes in cold weather. Ensure to have enough room to move arms around, the ability to zip up from the inside, and enough room around the feet so that they can rest in a comfortable position. Bags come in three basic styles, each one offering its own advantages.

Mummy Bag. Acquired its name by the occupant resembling an ancient Egyptian mummy when in it! The bag tapers from the opening following the contours of the body closely. There is very little extra air space once in the bag. The zipper may only reach halfway down the side of the bag and is protected by an insulated flap (called a “draft tube”). The opening of the bag will have an insulated hood with a draw cord to pull the hood snug around the face to keep warm air in. Mummy bags are designed to save weight and maximize heat retention, are best suited for extreme cold, and will come with two separate bags, an inner and outer, which are used together. The mummy bag is certainly the warmest of the bag styles.

www.mec.ca

Figure 2 Mummy Bag

Barrel Bag. This is a compromise between the efficiency of the mummy design and the economy of the rectangular bags. The shape tapers from the opening towards the foot, but is still considerably roomier than a mummy. Quite often there will be a hood with a draw cord, or at least an extension of one side of the opening that offers some head insulation. Depending on the insulation, this design is a good choice for spring, summer and fall camping.

www.mec.ca

Figure 3 Barrel Bag

Rectangular Bag – the most common economical bag. The zipper often opens fully to create a double sized blanket. This style is roomy and can be useful for warm weather camping or indoor accommodation. The disadvantages as a bag for hiking or expeditions are numerous. The extra air space around the torso, legs and feet means that it takes more heat energy to heat up and keep the space warm. The extra material means the bag is bigger and heavier. There is no protection for the head in cold weather. The liner materials used tend to retain moisture and odours.

www.mec.ca

Figure 4 Rectangular Bag

Military Bag. Based on the 1951 pattern, this sleeping bag consists of five main parts:

1. **The cover** of the sleeping bag is made of a moisture proof nylon. The cover's main purpose is to keep the bag clean and protect it from moisture.
2. **The outer bag** is down filled with a composition of 40% down and 60% feathers.
3. **The inner bag** is made in the same way as the outer. The inner bag is secured to the outer bag and liner using a series of ties.
4. **The liner** is flannelette and attaches to the inner bag.
5. **The Hood** (not shown) is pulled over the head and secured by straps pulled underneath the armpits.

Figure 5 The Outer Bag

Figure 6 The Inner Bag

Figure 7 The Liner

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What are the two types of insulation used in sleeping bags?

Q2. If you were planning to go on an over night winter FTX and the projected weather was expected to be extremely cold, what would be the best style of sleeping bag to take for the cold temperatures?

Q3. With the approach of the new cadet year you expect to do a fair amount of sleeping in the field. You decide to look for a naturally insulated sleeping bag to purchase. What fill power would you look for in a naturally insulated sleeping bag?

ANTICIPATED ANSWERS:

A1. Natural and synthetic.

A2. Mummy style.

A3. 550 FP.

Teaching Point 3 **Describe sleeping pads.**

Time: 10 min Method: Interactive Lecture

SLEEPING PADS

A sleeping pad is the foundation of a sleeping system. The pad cushions against the hard ground, and keeps a warm thermal barrier between the ground and the sleeping bag. Choose a pad that is appropriate for the activity being participated in and the weather expected. The colder the ground temperature, the more insulation needed. Pads come in several lengths and designs.

Closed cell foam pad – the foam is lightweight and doesn't absorb water. Foam pads come in a variety of individual thicknesses, depending on desired amount of insulation and comfort. Most foam pads are low priced and durable.

Figure 8 Closed Cell Foam Pad

Air mattress– rubber, vinyl or a combination of materials in a variety of thicknesses. Usually they are heavier than a foam pad, but offer good insulation when fully inflated. Disadvantages include being easily damaged and taking a long time to inflate for use and deflate to pack. In cold weather, if the air mattress is inflated by mouth, ice crystals will form inside from the moisture in your breath and will provide less insulation from the ground than dry air (later, in the warmth, the moisture will cause your mattress to rot).

Figure 9 Air Mattress

Self-inflating foam-air combination pads– these pads use foam as well as an adjustable valve to create a quick-to-inflate pad that offers better thermal insulation, is much more comfortable and warm and that it is light-weight like a foam pad.

Figure 10 Self-Inflating Air Combo Pad

CONFIRMATION OF TEACHING POINT 3

QUESTIONS:

Q1. What type of sleeping pad does not require inflation?

Q2. Name a disadvantage of the air mattress.

Q3. Name an advantage of the self-inflating pad.

ANTICIPATED ANSWERS:

A1. The closed cell foam pad does not require inflation.

A2. Punctures easily, considerable time to inflate / deflate, ice crystals may form inside the mattress.

A3. Very comfortable, warmer, lightweight and better thermal insulation.

Teaching Point 4 **Select additional personal equipment.**

Time: 10 min Method: Interactive Lecture

ACCESSORIES

During any hike or weekend exercise there is always a need to carry additional items that may not be necessarily required for the exercise itself. Some small pieces you should always carry in your pack when preparing for a hike are:

- **Bug repellent.** The active ingredient in bug repellent is DEET. Many brands are available; however, the greater the concentration the more effective it is.

Caution: DEET in high concentrations may cause health problems. Health Canada has banned any products with DEET concentrations over 30%.

As stated from the Public Health Agency of Canada:

- Children from birth to 2 years are not to use insect repellents containing DEET.
- Children between 2-12 years are to apply no more than three time a day, using the lowest concentration of DEET (10% or less).
- Individuals 12 years or older are to apply insect repellents containing no more than 30% DEET.

- **Flashlight.** To provide light in the dark, a flashlight should always be carried, the smaller the better for weight reasons (be sure to have a spare set of batteries and bulb before each trip).
- **Lip Balm.** Lips burn easily at any elevation and in cold the dry winds can make lips crack and bleed.

- **Map and compass.** Any time when going into the field a map and compass should be taken. Becoming turned around and lost could happen to anyone.
- **Matches.** At least 20, the kind that will strike anywhere and are waterproof. Store matches in a separate container inside your kit with a striker (35 mm film cases would suffice).
- **Notepad and pencil.** Allows for note taking and / or leaving a message.
- **Pocketknife or multi-tool.** Useful tool for many applications in the field. Hunting type knives with long fixed blades are not appropriate for most cadet activities.
- **Sunscreen.** A Sun Protection Factor (SPF) of 15 means that a person can remain in the sun without burning their exposed skin for 15 times longer with the protection than they could without it. Most sunburns can be prevented with a SPF of 15, however a SPF of 29 or higher is recommended.
- **Survival kit.** Reflects the needs of the user. Fill with items that you can use and that reflect the environment you will be travelling in.
- **Whistle.** Signalling device.

Testimonials detailing how lack of preparation led to discomfort in the outdoors will serve to reinforce the teaching points.

CONFIRMATION OF TEACHING POINT 4

QUESTIONS:

Q1. What are five accessories that should be brought on a hike or FTX?

Q2. What is the minimum number of matches that should be taken on an overnight exercise?

Q3. What is the active ingredient in bug spray?

ANTICIPATED ANSWERS:

A1. Answers may vary. Answers not listed above may be valid.

A2. The minimum number of matches that should be taken on an overnight exercise is 20.

A3. DEET is the active ingredient in bug spray.

END OF LESSON CONFIRMATION

Cadets will be expected to select their own equipment when packing for a FTX. The instructor will assess this selection informally when the cadet arrives for the FTX.

CONCLUSION

HOMEWORK/READING/PRACTICE

Cadets will be expected to select their own equipment and pack it for all FTXs.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Understanding what personal equipment is required for an outdoor activity allows to be prepared for conditions and to be comfortable in the environment. This is particularly important as outdoor activities represent a big part of the Army Cadet Program.

INSTRUCTOR NOTES/REMARKS

This lesson should be delivered prior to the bivouac FTX.

Cadets' backpacks should be verified for proper equipment prior to the FTX.

REFERENCES

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C2-012 0-89886-643-X Weiss, H. (1988). *Secrets of warmth for comfort or survival*. Seattle, WA: The Mountaineers.

ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 2

EO M121.02 – TRANSPORT PERSONAL EQUIPMENT

Total Time: 30 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-701/PG-001, *Green Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

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

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TP 1 to introduce the cadets to packing personal equipment.

A demonstration was chosen for TP 2 as it allows the instructor to explain and demonstrate the wearing of a backpack.

INTRODUCTION

REVIEW

Review of EO M121.01 (Select Personal Equipment):

Q1. What are five accessories that should be brought on a hike or FTX?

Q2. What is the minimum number of matches that should be brought on an over night exercise?

Q3. What is the active ingredient in most bug spray?

ANTICIPATED ANSWERS:

A1. Flashlight, lip balm, map and compass, matches, notepad and pencil, flashlight, pocket knife, sunscreen, whistle, survival kit and bug repellent. Other answers may also be correct.

A2. 20 matches.

A3. DEET is the active ingredient in bug spray.

OBJECTIVES

By the end of this lesson the cadets will be expected to select, properly pack, and wear a backpack.

IMPORTANCE

This lesson will allow cadets to train in the field, and carry their equipment safely and efficiently.

Teaching Point 1 **Explain packing personal equipment.**

Time: 15 min Method: Interactive Lecture

The objective at the end of this TP is for the instructor to demonstrate to the cadets how to pack a backpack. The backpack should contain the following items:

- Clothing (enough for over night in the field)
- Tent
- Drinking cup
- Sleeping bag
- Rain gear
- Hygiene kit
- Food
- Two garbage bags
- Mountain style individual stove
- Simulated fuel container
- Water bottle
- Pot set
- Survival kit

TYPES OF BACKPACKS

Backpacks come in different sizes, styles and available features. Many backpacks have been developed with specific uses in mind. They can differ greatly in their anatomy and features. Backpacks can be divided into two major categories, external frame and internal frame.

External Frame – These backpacks are constructed with a bag attached to a visible metal or resin frame. Some external frame packs offer a frame that adjusts in length; however, most are not adjustable. It is important to choose a frame that is the correct size. Try the backpack on and ensure the hip pads and hip belt rest snugly on your hips – the shoulder straps should connect to the harness at the same level as your shoulders. External frame packs have both advantages and disadvantages.

Advantages:

- High centre of gravity, aids with walking upright;
- Air flow between backpack and body makes for cool hiking;
- Easy to load;
- Cheaper than internal frame packs;
- Will not sag under heavy loads;
- Frame can be used to make a stretcher to evacuate an injured person; and
- Can carry large and awkwardly shaped objects.

Disadvantages:

- High centre of gravity makes it hard to balance on tricky terrain or when skiing;
- Does not move closely with the body, making it hard to scramble over obstacles; and
- Bulky for air travel.

Figure 1 External Frame Pack

Internal Frame – These packs are constructed with a resin or aluminium frame sewn into pockets in the harness of the bag. Often the frame consists of two “stays” running vertically along the backplane. Aluminium frames are to be moulded to the shape of your back. The bag is designed to carry all your gear internally with only pockets and accessories attached to the outside. Some smaller packs may offer the option of attaching a sleeping bag stuff sack to the top or bottom. Like the external frame packs, it is important to correctly size your internal frame pack. Some models offer a range of backpack sizes and some offer adjustable or replaceable stays.

Internal frame packs have both advantages and disadvantages:

Advantages:

- Backpack rides low and close to the body, allowing freedom of movement and good balance,
- Sleek profile makes it easy to bushwhack, crawl through tight boulder fields, etc,
- Comfortable harnesses, and
- Can be adjusted and moulded to the body.

Disadvantages:

- Difficult to load and pack,
- More expensive than external frame packs,
- Not useful for making stretchers.
- Hard to carry large or awkward objects, and
- Ventilation is restricted across the back.

www.abc-of-hiking.com/hiking-backpacks

Figure 2 Internal Frame

Backpack Features

Backpack features are additional attributes designed into the backpack that allow for efficient packing and carrying. Depending on the intended use of the backpack the following features may be looked for:

- **Bag opening –** The bag opening is an important feature. A small opening aids in weatherproofing but makes packing and unpacking more difficult. A wide opening is handy but the longer zippers or extra fasteners are often more prone to trouble. Ensure that the zipper or fastener for the opening(s) is not at a place that will receive a lot of stress when the bag is packed and carried. If the zipper breaks closing the bag may be difficult! The majority of larger bags will offer two or more compartments inside the pack. This will assist in placing heavier items in the proper place and in keeping kit organized.
- **Shoulder harness -** Simple straps will do for lighter loads, however for heavier loads go for curved, broader and more padded shoulder straps. This will prevent the straps from cutting into the shoulders.
- **Chest Strap / Sternum Strap –** These straps often connect across your chest using a clip-lock. By connecting and tightening them you prevent your backpack from pulling your shoulders back.
- **Hip Belt –** This belt allows the strain of the backpack to move from the shoulders down to the hips and closer to the centre of gravity, making the load more bearable. Look for a hip belt that goes full circle under the lumbar pad. Ensure the pad has soft and broad padding to avoid pressure points that could quickly become painful.

www.abc-of-hiking.com/hiking-backpacks

Figure 3 Attributes Diagram A

- **Compression Straps –** These straps allow for the backpack and loads to be compressed, or squeezed into a smaller package. The tighter and more compact the load, the easier it will be to transport.
- **Quick Release Straps –** Many packs are equipped with a set of shoulder straps designed to release quickly in the event of an emergency, or when time / room demands a timely removal.
- **Inner and Outer Pocket Configurations –** Inner and outer pockets allow for a better separation of provisions, gear and other backpack contents. Outer pockets are mostly used for items that must be available while hiking. Outer pockets should not be over weighted to prevent a shift in centre of balance.
- **Hydration System –** Many packs have either built in water bladders (hydration packs) or have a special pocket for a water bladder and a hole for the drinking tube.
- **Splash Cover –** Backpacks are generally not 100% waterproof. Some backpacks have a built in splash cover which is basically a waterproof cover that encompasses the entire pack.
- **Spin Drift Cover –** On large backpacks the top compartment can be flipped backwards giving access to the backpacks inside compartments.
- **Bungee Cords and Equipment Straps –** Most backpacks have either bungee cords or equipment straps or a combination of both that provide the means to fix equipment to the outside of the backpack (e.g. hiking poles, ice axes, and crampons).

www.abc-of-hiking.com/hiking-backpacks

Figure 4 Attributes Diagram B

PACKING

When preparing for a hiking exercise it is important to pack effectively. Every trip is unique and every backpack is different; however, when following certain principles in packing a backpack one can enjoy any trip with comfort and ease. To ensure a backpack is properly packed ABC's of packing should be employed. These are: **A**ccessibility, **B**alance, and **C**ompactness.

Accessibility - when backpacking, there will always be a requirement to keep certain things accessible. In some cases it is just a matter of convenience. Keeping items one might need during the day handy will save time. Some suggested items to keep accessible are:

• Lunch	• Extra layers for warmth	• Toilet paper
• Water	• Rainwear	• Toilet trowel
• Maps	• First aid kit	• Camera
• Sunscreen	• Snack Food	• Sun glasses

Balance – A heavier balanced backpack is easier to carry than a lighter unbalanced pack. If a backpack is top heavy, it will be hard to maintain balance especially when crossing obstacles and navigating sloping terrain. A backpack with too much weight at the bottom will hinder stride. The key is to pack the dense, heavy things in close to the body and at a level between the shoulder blades and the bottom of the rib cage. Items such as food, the tent, and the radio are good items to carry in mid regions of the pack.

CATO 14-37 states that cadets 12 –15 years of age can carry loads weighing less than 25% of their body weight. Cadets at the age of 16 cannot carry a load exceeding 30% of their body weight.

Compactness – When packing gear it is important to pack well and effectively utilize space. A compact backpack will be less awkward to carry. To take advantage of space in the pack, break large units down into

smaller units. Look for dead spaces to fill like pots, pans, cups and shoes. These areas can be filled with food or clothing. Other items can be compressed down to half size using compression sacks. If the backpack has compression straps, it too can be compressed tightly.

Packing Considerations

- Waterproof the sleeping bag and clothes by lining the backpack with a garbage bag. Waterproof small items with zip-lock bags.
- Organize kit into separate stuff sacks, for example:
  - warm underwear, socks, hat and gloves in one sack; and
  - eating utensils, extra flashlight, batteries and toiletries in another.
- Pack food above fuel.
- Pack heavy, dense items like food close into the body.
- Odd items such as shoes can be used to fill small spaces.
- Water should be kept in an easily accessible place.
- Items like maps, first aid kit, lunch and a warm layer of clothing should be kept towards the top or outside pockets.
- Fasten all pockets and avoid letting anything hang out.
- Always protect and pad sharp edges of equipment and tools.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. Backpacks can be divided into what two categories?

Q2. Name five backpack features.

Q3. Name and describe the ABC's to packing.

ANTICIPATED ANSWERS:

A1. External and internal frame.

A2. Any five of the following: shoulder harness, chest strap, hip belt, inner and outer pockets, hydration system, splash cover, spindrift cover, bungee cords and equipment straps.

A3. **A**ccessibility, **B**alance, **C**ompactness (explanations provided above).

Teaching Point 2 — **Explain and demonstrate how to properly wear a backpack.**

Time: 10 min — Method: Demonstration

DONNING A BACKPACK

The instructor should inform the cadets that left-handed people might wish to follow these directions using opposite hands, in order to accommodate the dominant hand.

There are many different ways to pick up and don a backpack. If donning is done incorrectly, a back injury can occur. The following is a step by step method considered safe for donning a backpack:

1. Unlatch hip belt and loosen both shoulder straps.
2. Pick the backpack up with your right hand on the crossbar from which the shoulder straps are suspended and left hand on the right strap lift backpack high enough to rest it on your right knee.
3. Slide right arm through the shoulder strap and swing it onto your back.
4. Put left arm through the other strap.
5. Tighten the hip belt and shoulder straps.
6. Ensure all loose belts or strap ends are tucked in and off you go.

When properly adjusted the backpack should leave shoulders and hips free to move. This allows the individual wearing it to stand erect in a normal position and walk at a normal pace.

- Give cadets the opportunity to practice donning the backpack, as time allows.
- If CF rucksacks are to be used, they should be assessed for proper assembly.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What should be loosened prior to donning the backpack?

Q2. When the backpack is harnessed and on the back, what should one ensure is tucked in?

Q3. When properly adjusted the backpack should leave the (*blank*) and the (*blank)* free to move.

ANTICIPATED ANSWERS:

A1. Unlatch hip belt and loosen both shoulder straps.

A2. All loose belts or strap ends are tucked in.

A3. Shoulders and Hips.

END OF LESSON CONFIRMATION

QUESTIONS:

Q1. Backpacks can be divided into what two categories?

Q2. Name and describe the ABC's to packing.

Q3. What should be loosened prior to donning the backpack?

Q4. When the backpack is harnessed and on the back, what should one ensure is tucked in?

ANTICIPATED ANSWERS:

A1. External and Internal frame.

A2. **A**ccessibility, **B**alance, **C**ompactness.

A3. Unlatch hip belt and loosen both shoulder straps.

A4. All loose belts or strap ends are tucked in.

CONCLUSION

HOMEWORK/READING/PRACTICE

Task the cadets to prepare their own backpacks prior to a field training exercise. Have the cadets bring in their completely packed backpacks for inspection prior to the exercise.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

The cadets can now to go into the field and carry their equipment and gear safely and effectively.

INSTRUCTOR NOTES / REMARKS

This lesson should be delivered prior to the bivouaxc FTX.

Cadets' backpacks should be verified for proper packing during the FTX.

Cadets should transport their personal equipment during the FTX.

REFERENCES

C2-004 1-896713-00-9 Tawrell, P. (1996). *Camping and wilderness survival: The ultimate outdoors book*. Green Valley, ON: Paul Tawrell.

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C2-017 0-7627-0476-4 Roberts, H. (1999). *Basic essentials, backpacking*. Guilford, CT: The Globe Pequot Press.

ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 3

EO M121.03 – TIE KNOTS AND LASHINGS

Total Time:	90 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-701/PG-001, *Green Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

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

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for TPs 1 and 2 to introduce the cadets to the types and the care and maintenance of ropes.

A demonstration and performance was chosen for TP 3 as it allows the instructor to explain and demonstrate how to tie various knots, while providing an opportunity for the cadets to practice under supervision.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to tie various knots and lashings, to include:

- Thumb (overhand);
- Reef (Square);
- Figure of eight;
- Double figure of eight (figure of eight loop, follow through / rewoven, and figure of eight on a bight);
- Clove hitch; and
- Half hitch.

IMPORTANCE

Knots and lashings are all used for binding, building or securing. Cadets will need to use knots when erecting a shelter and building a tent site. As such, it is important to know how to tie knots properly and when and where they should be used.

Teaching Point 1 **Explain types of ropes and their common uses.**

Time: 10 min Method: Interactive Lecture

All specialized terms used in this instructional guide are found in the glossary (Attachment A). This handout could be given to the cadets at the end of the lesson.

TYPES OF ROPE

Ropes are made with natural or synthetic fibres. Hemp and manila are the most common natural fibre ropes, although sisal, coir and cotton are also used. Natural fibres are often used in larger sizes for rope bridging because they have limited stretch and are easy to grip when wet.

Natural fibres

Hemp is obtained from the stem of the plant *Cannabis sativa*. This natural fibre makes one of the strongest natural-fibre ropes though it has a tendency to rot if left wet for long periods of time. Hemp ropes need to be frequently tarred – covered with tar, to help prevent rotting.

Manila is the fibre obtained from the wild banana plant, *Musa textiles*. This material is as strong as hemp and more resistant to rot, so it rarely needs to be tarred.

Sisal is a rope-making fibre derived from *Agave sisalana*, a cactus-type plant from Central America. It is weaker than manila or hemp and requires treating with chemicals to make it waterproof and rot-resistant.

Cotton is mainly used to make small ropes and twines. Cotton rots easily; therefore, it needs to be tarred.

Coir is a natural fibre derived from the outer part of the coconut. It is not a very strong material but it is light and has a high degree of stretch. It is the only natural-fibre rope that floats.

Synthetic fibres

Synthetic ropes are usually made from nylon, polyester or polypropylene. Synthetic ropes are generally stronger and lighter than natural ropes.

Nylon ropes are very strong (more than two and a half times the strength of hemp). This rope is mostly used when sudden shock loads may be applied, such as mooring ropes and climbing ropes. It is used for most fishing line when it is spun into a heavy monofilament yarn. Nylon ropes lose about 5 -10 % of their strength when wet. It wears very well, and is resistant to chafe, mildew and rot. Nylon is the strongest of the synthetic ropes.

Polyester, also known as Dracon or Terylene, is weaker than nylon but holds its strength when wet. It resists rot and chafe.

Polypropylene is not as strong as nylon and polyester, but is considerably cheaper. It is light so it will float, making it useful for rescue ropes and short mooring ropes. However, polypropylene does not resist abrasion well.

Over the last few years, additional rope materials have been developed. They are lighter, stronger and have less stretch than most natural and synthetic fibres. These ropes are made of chemicals. Some of these rope materials are Kevlar, Tawron, Technora, Spectra, Dynema, Vectran and Zylon.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS:

Q1. What are two types of ropes?

Q2. What are some types of natural ropes?

Q3. How much strength does a nylon rope lose when wet?

ANTICIPATED ANSWERS:

A1. Natural and synthetic.

A2. Hemp, manila, sisal.

A3. 5 -10%.

Teaching Point 2 **Explain the care and maintenance of ropes.**

Time: 5 min Method: Interactive Lecture

CARE AND MAINTENANCE OF ROPES

Ropes, like other pieces of equipment, require care and maintenance to ensure they are in good condition when needed. The following are some general guidelines for rope care:

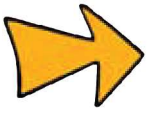
Sunlight exposure: All ropes experience deterioration from exposure to ultraviolet sunlight. Ropes are to be stored in cool, dry, and dark locations.

Chemical or fume contamination: If a rope comes into contact with such a substance it may begin to deteriorate. If contaminated, wash with cold running water. Remove oil and grease with mild soap solution.

Storage: Ropes must be stored in bins, on raised surfaces, or hung where air can circulate freely. Ropes must be stored in cool, dry, dark locations to avoid sunlight and excessive heating. Excessive cold will make rope brittle.

Natural wear is unavoidable and, if not excessive, is harmless. Replace lines if approximately 20% wear is evident. Look for chafed areas, rot and fatigue. Serious damage can be seen when the strands are distorted and bear unequal strain.

Cleaning and drying: Depending on frequency of use, ropes should be cleaned according to current condition; a rope that is covered in mud and clay should be washed before its next use. To clean, wash in a sudsy tub of liquid detergent (detergent must be suitable for rope cleaning). Rinse, coil and hang to dry.



General tips on rope care:

- Whip, melt (hot knife) or bind the rope ends to keep the rope from unravelling;
- Avoid snagging on, or dragging across, sharp rocks;
- Inspect the rope before and after use for damage;
- Do not step on a rope; and
- Distribute wear on the rope.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS:

Q1. What effect does sunlight have on ropes?

Q2. Where should ropes be stored?

Q3. When should a rope be discarded?

ANTICIPATED ANSWERS:

A1. All ropes experience deterioration from exposure to ultraviolet sunlight.

A2. Ropes must be stored in bins, on raised surfaces, or hung where air can circulate freely. Ropes must be stored in cool, dry, dark locations.

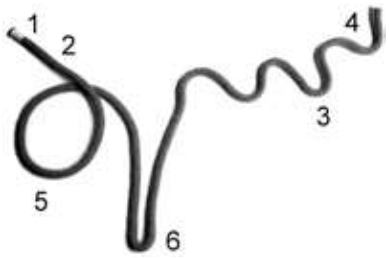
A3. When 20% wear is evident. Look for chafed areas, rot and fatigue.

Teaching Point 3 **Explain and demonstrate how to tie knots.**

Time: 65 min Method: Demonstration and Performance

TYING KNOTS

Before teaching how to tie knots, the following terms shall be clarified, as they will be used to explain how to make the different knots.



Pocket Guide to Knots and Splices, by Des Pawson, 1991

Figure 1 Parts of a Rope

1. **Working end** (running end) – The end of the rope that is used during the tying of the knot.
2. **Working part** (running part) – The short length of rope that is manipulated to make the knot.
3. **Standing part –** Part of the rope usually ‘stands still’ during the knot tying process. Often it is the longer end that leads away from the loop, bight or knot.
4. **Standing end –** The end of the rope that not immediately being used in the tying of a knot.
5. **Loop** (crossing turn) – A circle created in the process of tying a knot.
6. **Bight –** Middle part of a length of rope. This term also refers to a loop of rope that does not cross over itself.

These web pages have some excellent animated knots:

http://www.mistral.co.uk/42brghtn/knots/42ktmenu.html

http://www.korpegard.se

Cadets should be given two short ropes and two small poles in order to tie knots, hitches and lashings along with the instructor.

THUMB KNOT

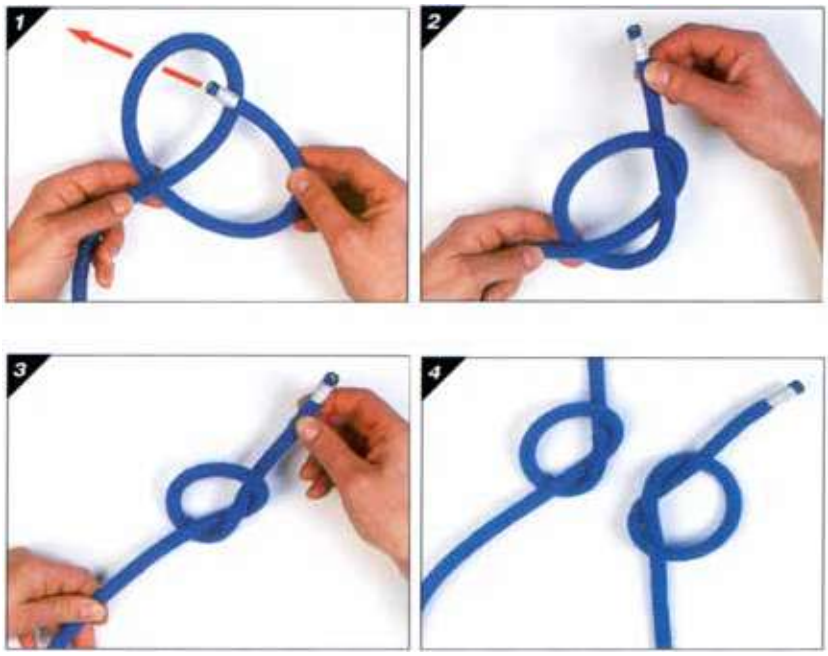
- **Other names:** Overhand knot, Simple knot.
- **Uses:** Keep the end of a rope from unravelling or to stop a rope from passing through an eye.
- **Qualities:** Easy to make, stays in place.
- **Faults:** It is difficult to untie. An overhand knot in the middle of a length of rope will reduce the strength of the rope by about half.

The instructor shall provide an EXPLANATION and DEMONSTRATION of the complete skill.

The instructor shall also provide an EXPLANATION and DEMONSTRATION of each step required to effectively complete the skill.

Procedure:

1. Form a loop with the working end passing under the standing part of the rope (Diagram 2, Figure 1).
2. Tuck the working end down through the middle of the loop formed by the crossing turn and out of the loop (Diagram 2, Figure 2).
3. Pull both ends to tighten the knot.
4. As it is being tightened, the position of the knot can be moved nearer the end if so required (Diagram 2, Figure 3).



Pocket Guide to Knots and Splices, by Des Pawson, 1991

Figure 2 Thumb Knot

Cadets will IMITATE the demonstration provided by the instructor for each step within the skill. The instructor(s) will SUPERVISE the cadets during this imitation.

REEF KNOT

- **Other names:** Square knot, opposite knot.
- **Uses:** Joining two ropes of equal thickness. Also used in first aid for tying bandages.
- **Qualities:** Lies flat, holds well, and is easily untied.

The instructor shall provide an EXPLANATION and DEMONSTRATION of the complete skill. The instructor shall also provide an EXPLANATION and DEMONSTRATION of each step required to effectively complete the skill.

Procedure:

1. Take the running ends of two different ropes and place the left-hand working end across the right working end (Diagram 3, Figure 1).
2. Tuck the left-hand end under, and back up over the right end (Diagram 3, Figure 2).
3. Bring the two ends together again and place the right-hand end over the left-hand one (Diagram 3, Figure 3).
4. Tuck the right-hand end under and back up over the left-hand end (Diagram 3, Figure 4).
5. Dress the knot by pulling on both ends (Diagram 3, Figure 5).

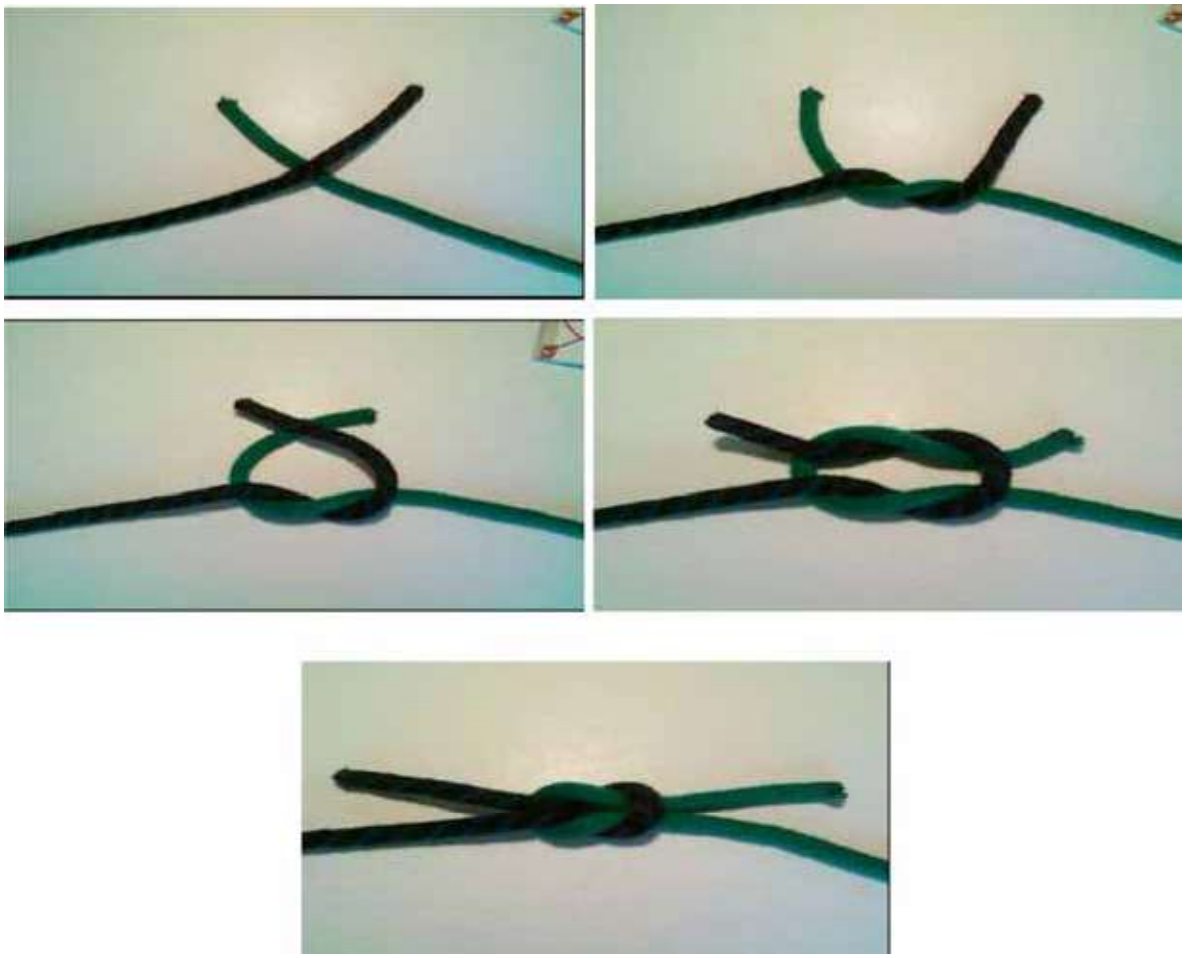


Figure 3 Reef Knot

When done correctly, the running end and the standing end of one rope are on the same side of the bight formed by the other rope. To tie this knot, a good trick is to say “left over right and right over left.”

Cadets will IMITATE the demonstration provided by the instructor for each step within the skill. The instructor(s) will SUPERVISE the cadets during this imitation.

FIGURE OF EIGHT KNOT

- **Uses:** Keep the end of a rope from unravelling or to stop a rope from passing through an eye.
- **Qualities:** Same uses as the thumb knot but bulkier and easier to undo.

The instructor shall provide an EXPLANATION and DEMONSTRATION of the complete skill.

The instructor shall also provide an EXPLANATION and DEMONSTRATION of each step required to effectively complete the skill.

Procedure:

1. Start by forming a loop with the running end passing under the standing end, and then make a bight in the running end (Diagram 1, Figure 4).
2. Pass the running end in front of the standing end then thread it through the loop from the back (Diagram 2, Figure 4).
3. The knot should now have the figure eight, which gives it its name (Diagram 3, Figure 4).

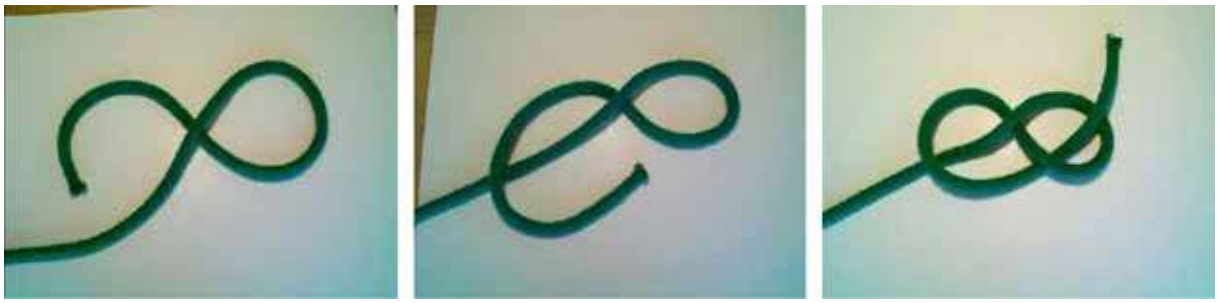


Figure 4 Figure of Eight Knot

Cadets will IMITATE the demonstration provided by the instructor for each step within the skill. The instructor(s) will SUPERVISE the cadets during this imitation.

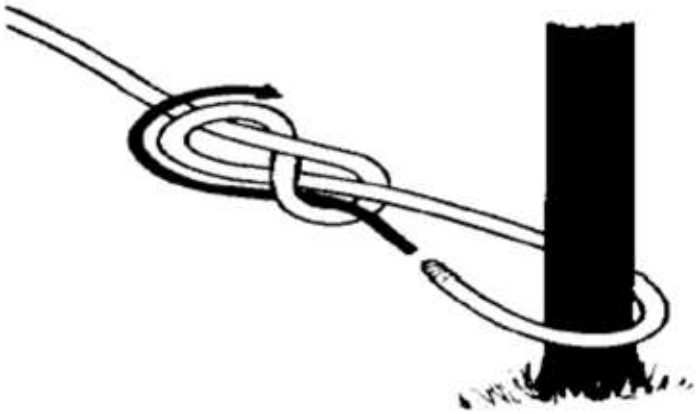
DOUBLE FIGURE OF EIGHT

- **Other name:** Figure-of-eight loop.
- **Uses:** To anchor a rope around a tree trunk, pole or such item.
- **Qualities:** Will not slip and is easy to undo.

The instructor shall provide an EXPLAINATION and DEMONSTARTION of the complete skill.

The instructor shall also provide an EXPLINATION and DEMONSTARTION of each step required to effectively complete the skill.

Procedure: There are two methods to do this knot. However, the first one is the one to use to anchor the rope to a tall tree or wide pole or trunk (Diagram 5).

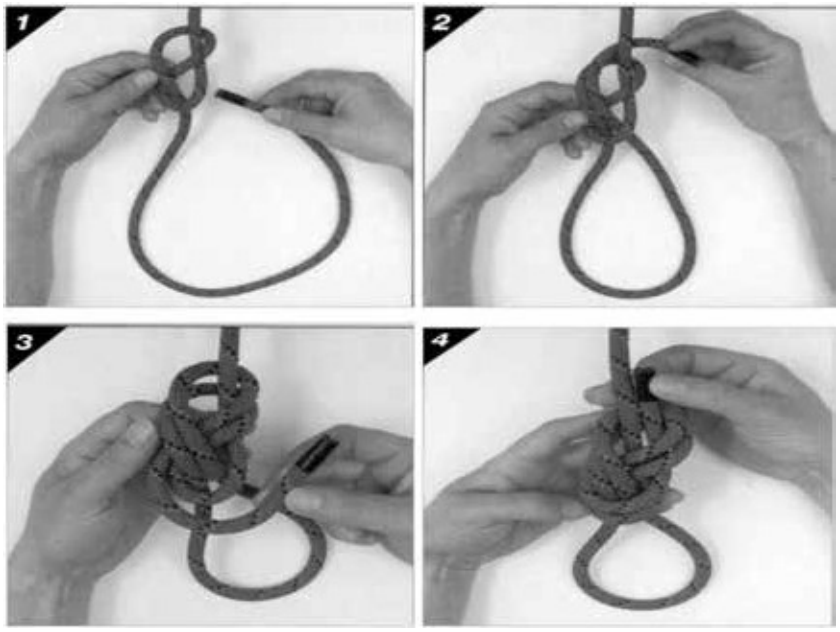


Army Cadet Reference Handbook

Figure 5 Double Figure of Eight Knot

The steps for method #1 are:

1. Begin with a loose figure of eight knot (Diagram 6, Figure 1).
2. Guide the running end back up through the loop it just came down through (Diagram 6, Figure 2).
3. Have the running end trace alongside the rope in the original figure of eight under the standing end.
4. Have the running end follow the original figure of eight under the double rope (Diagram 6, Figure 3).
5. The running end follows the original figure of eight (Diagram 6, Figure 4).
6. Pull tight and dress knot by flattening it and making sure the ropes are side by side.



Pocket Guide to Knots and Splices, by Des Pawson, 1991

Figure 6 Double Figure of Eight Knot, Method #1

The steps for method #2 are: double the rope and follow the steps to make a figure of eight knot. (See Diagram 7.)

Pocket Guide to Knots and Splices, by Des Pawson, 1991

Figure 7 Double Figure of Eight Knot, Method #2

Cadets will IMITATE the demonstration provided by the instructor for each step within the skill. The instructor(s) will SUPERVISE the cadets during this imitation.

CLOVE HITCH

- **Uses:** To finish off knots like the round turn and two half hitches and the various types of lashings. To secure a rope to a spar, rail or similar fitting.
- **Qualities:** Quick and easy to tie. Can be made with the end or with the bight of the rope.

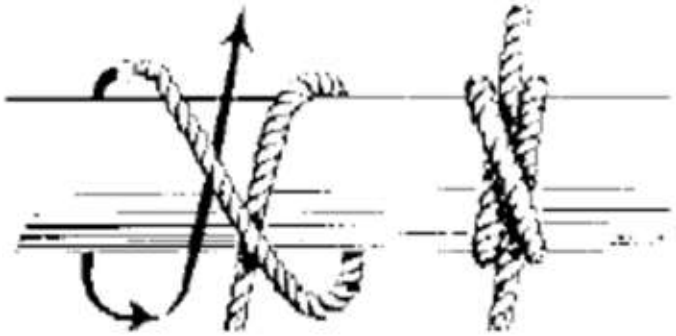
The instructor shall provide an EXPLANATION and DEMONSTRATION of the complete skill.

The instructor shall also provide an EXPLANATION and DEMONSTRATION of each step required to effectively complete the skill.

Procedure: There are two methods to tie a clove hitch; one using the end and the other using the bight.

The steps for tying a clove hitch using the end of the rope are:

1. Pass the running end of the rope over the rail from front towards the back.
2. Bring the running end under the rail and over the standing end towards the left.
3. Bring the running end over the spar to the left.
4. Bring the running end out under the rail and thread it up under the rope on the rail by the crossover.
5. Work the hitch tight with the running end and the standing end snug against each other.
6. Be sure to leave enough rope on the end so that it does not unravel.



Army Cadet Reference Handbook

Figure 8 Clove Hitch

The steps for tying a clove hitch using the bight are:

1. In the middle of the rope, make a crossing turn or half hitch, with the rope that comes from the left being on top.
2. To the right of the first crossing turn, make a half hitch with exactly the same configuration (Diagram 9, Figure 1).
3. Put the right-hand half hitch on top of the left-hand half hitch (Diagram 9, Figure 2).
4. The pair of hitches are now slipped over the top of the post (Diagram 9, Figure 3).

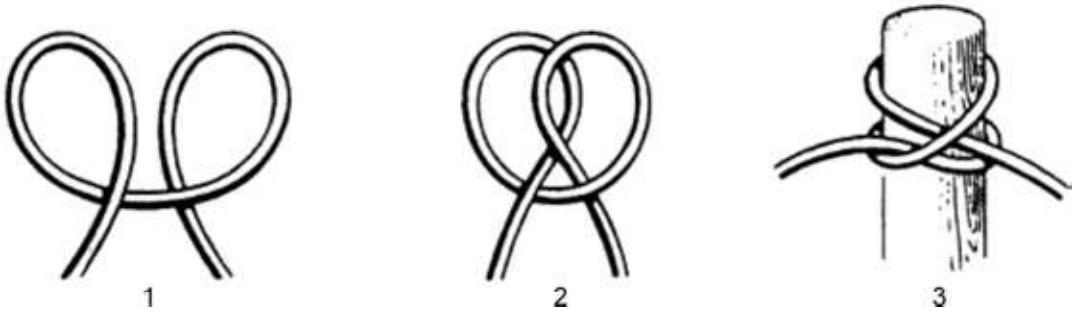


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Figure 9 Clove Hitch

Cadets will IMITATE the demonstration provided by the instructor for each step within the skill. The instructor(s) will SUPERVISE the cadets during this imitation.

HALF HITCH

- **Uses:** Make other knots stronger. Hang, tie or hook objects.
- **Quality:** Easy to make.
- **Fault:** Cannot support a lot of strain.

The instructor shall provide an EXPLANATION and DEMONSTRATION of the complete skill.

The instructor shall also provide an EXPLANATION and DEMONSTRATION of each step required to effectively complete the skill.

Procedure: Pass the rope around the pole and then behind the standing part and into the eye of the loop.

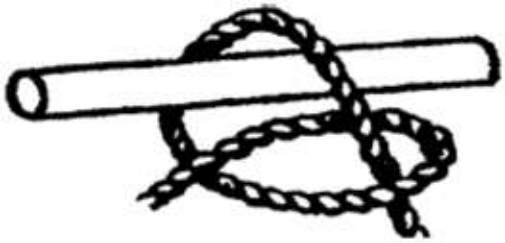

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Figure 10 Half Hitch

Cadets will IMITATE the demonstration provided by the instructor for each step within the skill. The instructor(s) will SUPERVISE the cadets during this imitation.

Give cadets handout B on knots, hitches, and lashings.

CONFIRMATION OF TEACHING POINT 3

QUESTION:

Q1. What is the fault of the half hitch?

Q2. Which knot will be used to anchor a rope to a tree trunk?

Q3. What are the two types of fibre that can be used to make ropes?

ANTICIPATED ANSWERS:

A1. Cannot support a lot of strain.

A2. Double figure of eight knot.

A3. Natural and synthetic fibres.

END OF LESSON CONFIRMATION

Cadets are to tie all knots, hitches and lashings learned in this EO.

CONCLUSION

HOMEWORK/READING/PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Knots, hitches and lashings have many uses in the field and will prove necessary in various situations, such as erecting a shelter, building a bivouac site or constructing a rope bridge. It is therefore important to know how to tie the knots properly, as well as when and where they should be used.

INSTRUCTOR NOTES/REMARKS

Where possible, the instructor should demonstrate a variety of natural and synthetic types of ropes.

Cadets should be given the opportunity to tie knots during the bivouac FTX

REFERENCES

A0-004 B-GN-181-105/FP-E00 DMPPD 9-4. (1997). *CFCD 105 fleet seamanship rigging and procedures manual*. Ottawa ON: The Department of National Defence.

C2-007 0-7858-1446-9 Pawson, D. (2001). *Pocket guide to knots and splices*. Edison, NJ: Chartwell Books, Inc.

Bight	Middle part of a length of rope. This term also refers to a loop of rope that does not cross over itself.
Chafe	Wear caused by abrasion.
Coil	Rope made up in neat series of circles usually for storage purposes.
Cordage	General term to cover all sorts and sizes of rope.
Crossing turn	A circle of rope made with the rope crossing over itself.
Eye	The hole inside a circle of rope; a permanent loop made at the end of a rope.
Mildew	Any fungus that attacks ropes when exposed to damp, resulting in a thin, furry, whitish coating or discoloration.
Standing end	The end of the rope not immediately being used in the tying of a knot.
Standing part	Part of the rope that usually “stands still” during the knot tying process. Often it is the longer end that leads away from the loop, bight or knot.
To tar	To cover a rope with a thick, sticky, brown to black liquid with a pungent odor, obtained by the destructive distillation of wood, coal, peat, shale, etc., to extend its life.
Working end	The very end of the rope that is used during the tying of the knot. Also called “running end.”
Working part	The short length of rope that is manipulated to make the knot. Also called “running part.”

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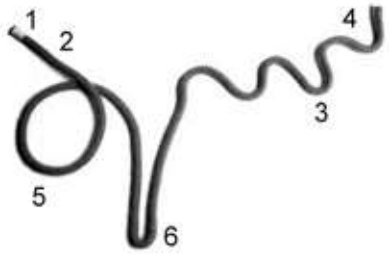
EO M 121.03 – KNOTS, HITCHES, LASHINGS



Pocket Guide to Knots and Splices, by Des Pawson, 1991

Figure B-1 Parts of a Rope

1. Working end (running end) – The end of the rope that is used during the tying of the knot.
2. Working part (running part) – The short length of rope that is manipulated to make the knot.
3. Standing part – Part of the rope that usually “stands still” during the knot tying process. Often it is the longer end that leads away from the loop, bight or knot.
4. Standing end – The end of the rope not immediately being used in the tying of a knot.
5. Loop (crossing turn) – A circle created in the process of tying a knot.
6. Bight – Middle part of a length of rope. This term also refers to a loop of rope that does not cross over itself.

These web pages have some excellent animated knots.

http://www.mistral.co.uk/42brghtn/knots/42ktmenu.html

http://www.korpegard.se

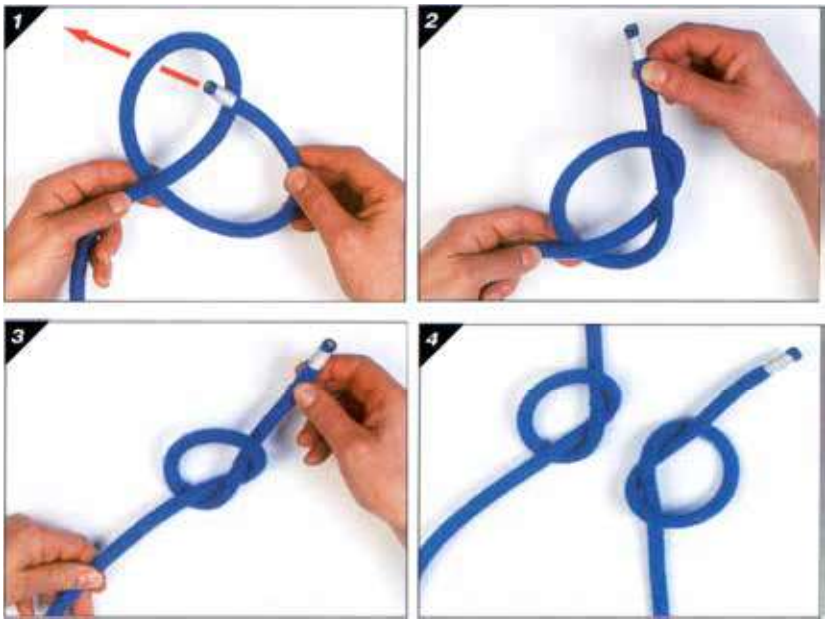
THUMB KNOT

- **Other names:** Overhand knot, Simple knot.
- **Uses:** Keep the end of a rope from unravelling or to stop a rope from passing through an eye.
- **Qualities:** Easy to make, stays in place.
- **Faults:** It is difficult to untie. An overhand knot in the middle of a length of rope will reduce the strength of the rope by about half.
- **Procedure:**

  (1) Form a loop with the working end passing under the standing part of the rope (Figure B-2, image 1).

  (2) Tuck the working end down through the middle of the loop formed by the crossing turn and out of the loop (Figure B-2, image 2).

  (3) Pull both ends to tighten the knot. As it is being tightened the position of the knot can be moved nearer the end if so required (Figure B-2, image 3).



Pocket Guide to Knots and Splices, by Des Pawson, 1991

Figure B-2 Thumb Knot

REEF KNOT

- **Other names:** Square knot, Opposite knot.
- **Uses:** Joining two ropes of equal thickness. Also used in first aid for tying bandages.
- **Qualities:** Lies flat, holds well and is easily untied.
- **Procedure:**

  (1) Take the running ends of two different ropes and place the left-hand working end across the right working end (Diagram 3, Figure 1).

  (2) Tuck the left-hand end under, and back up over the right end (Diagram 3, Figure 2).

  (3) Bring the two ends together again and place the right-hand end over the left-hand end (Diagram 3, Figure 3).

(4) Tuck the right-hand end under and back up over the left-hand end (Diagram 3, Figure 4).

(5) Dress the knot by pulling on both ends (Diagram 3, Figure 5).

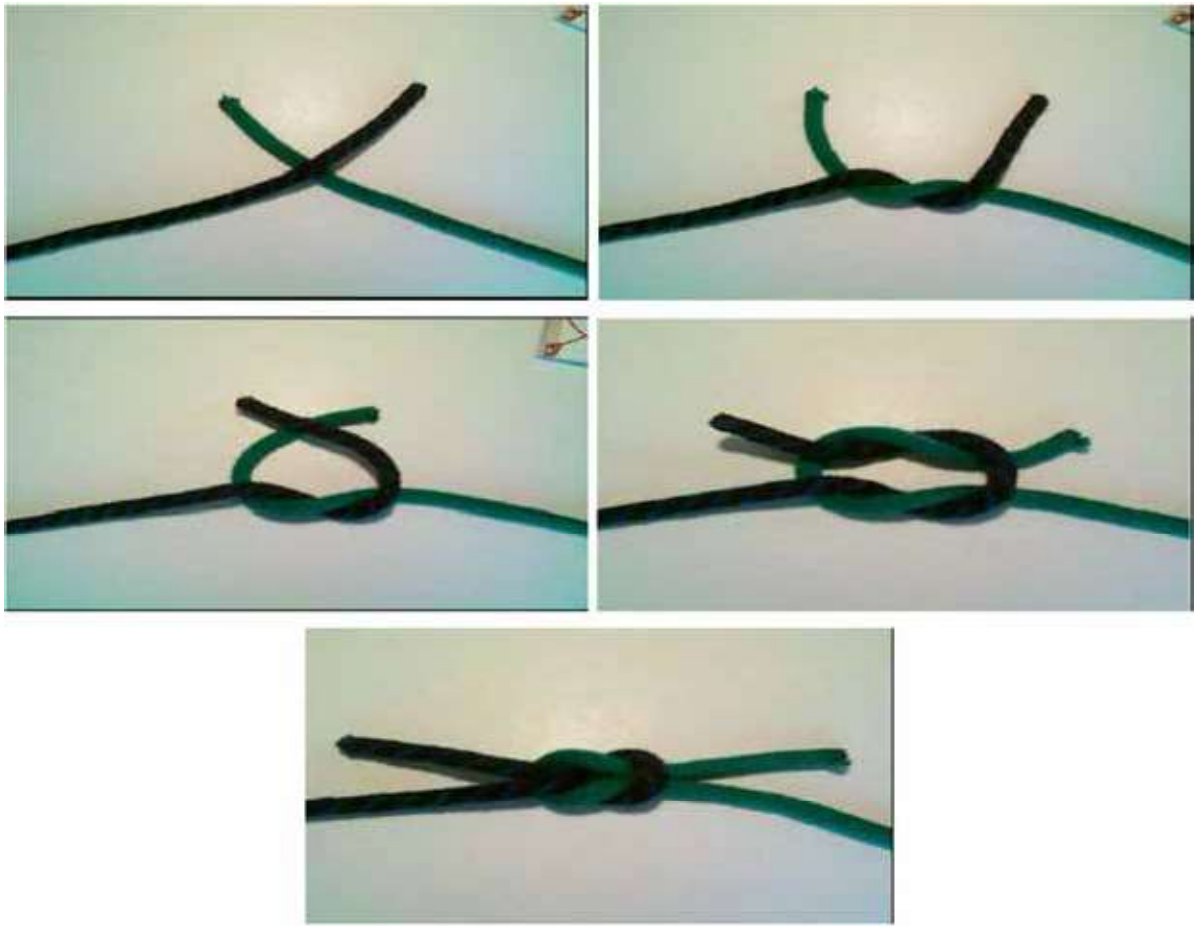


Figure B-3 Thumb Knot

When done right, the running end and the standing end of one rope come out on the same side of the bight formed by the other rope. To tie this knot, a good trick is to say “left over right and right over left.”

FIGURE OF EIGHT KNOT

- **Uses:** Keep the end of a rope from unravelling or to stop a rope from passing through an eye.
- **Qualities:** Same uses as the thumb knot but bulkier and easier to undo.
- **Procedure:**

(1) Start by forming a loop with the running end passing under the standing end, and then make a bight in the running end (Diagram 4, Figure 1).

(2) Pass the running end in front of the standing end then thread it through the loop from the back (Diagram 4, Figure 2).

(3) The knot should now have the figure eight, which gives it its name (Diagram 4, Figure 3).

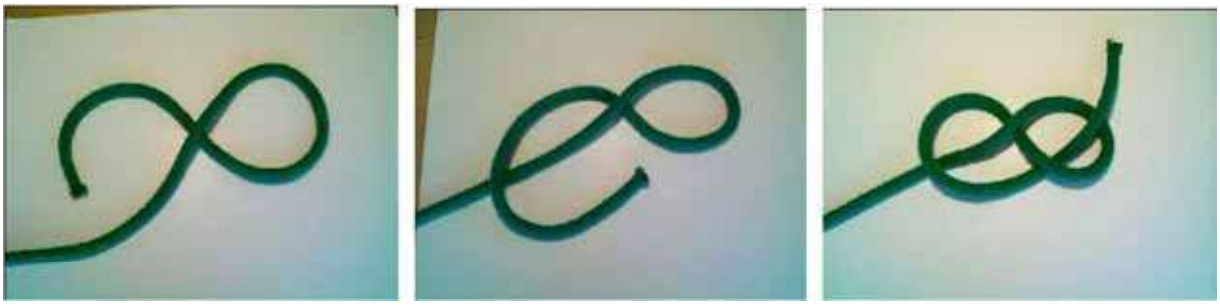


Figure B-4 Figure of Eight Knot

DOUBLE FIGURE OF EIGHT

- **Other name:** Figure-of-eight loop.
- **Uses:** To anchor a rope around a tree trunk, pole or such item.
- **Qualities:** Will not slip and is easy to undo.
- **Procedure:** There are two methods to do this knot. However, the first one is the one to use to anchor the rope to a tall or wide pole or trunk (Diagram 5).

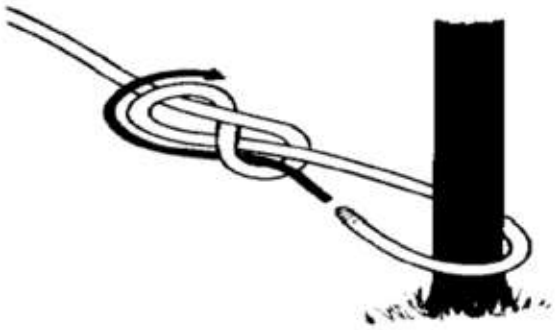
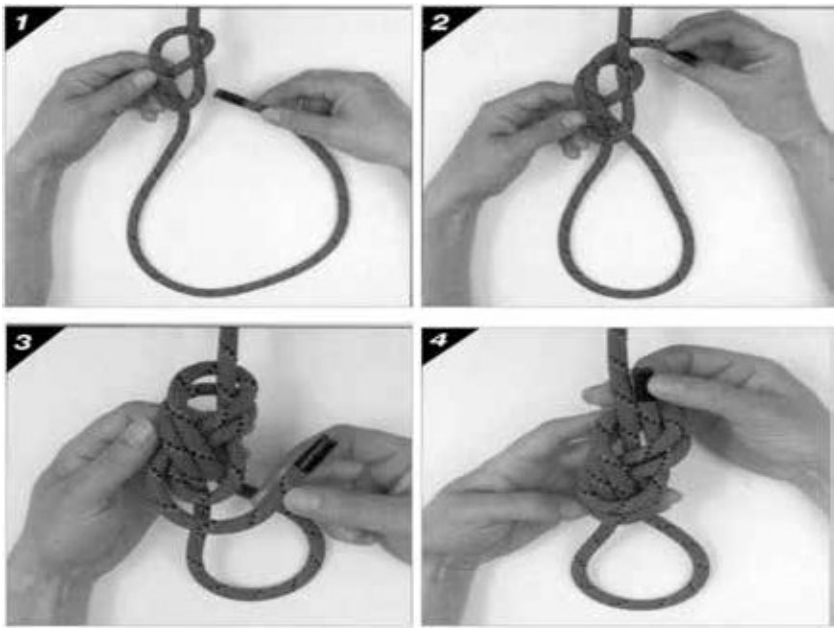


Figure B-5 Double Figure of Eight Knot

The steps for method #1 are:

1. Begin with a loose figure of eight knot (Diagram 6, Figure 1).
2. Guide the running end back up through the loop it just came down through (Diagram 6, Figure 2).
3. Have the running end trace alongside the rope in the original figure of eight under the standing end. Have the running end follow the original figure of eight under the double rope (Diagram 6, Figure 3).
4. The running end follows the original figure of eight (Diagram 6, Figure 4).
5. Pull tight, dress knot by flattening it and making sure the ropes are side by side.



Pocket Guide to Knots and Splices, by Des Pawson, 1991

Figure B-6 Double Figure of Eight Knot, Method #1

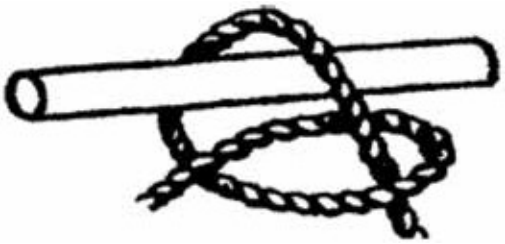
The steps for method #2 are double the rope and follow the steps to make a figure of eight knot. (See Figure B-7.)

Pocket Guide to Knots and Splices, by Des Pawson, 1991

Figure B-7 Double Figure of Eight Knot, Method #2

HALF HITCH

- **Uses:** Make other knots stronger. Hang, tie or hook objects.
- **Quality:** Easy to make.
- **Fault:** Cannot support a lot of strain.
- **Procedure:** Pass the rope around the pole and then behind the standing part and into the eye of the loop.



Army Cadet Reference Handbook

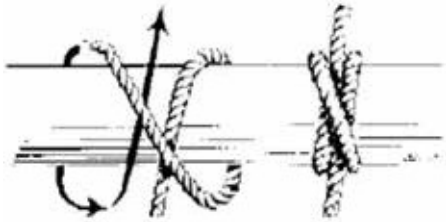
Figure B-8 Half Hitch

CLOVE HITCH

- **Uses:** To finish off knots like the round turn and two half hitches and the various types of lashings. To secure a rope to a spar, rail or similar fitting.
- **Qualities:** Quick and easy to tie. Can be made with the end or with the bight of the rope.
- **Procedure:** There are two methods to tie a clove hitch; one using the end and the other using the bight.

The steps for tying a clove hitch using the end of the rope are:

1. Pass the running end of rope over the rail from front towards the back.
2. Bring the running end under the rail and over the standing end towards the left.
3. Bring the running end over spar to the left.
4. Bring the running end out under the rail and thread it up under the rope on the rail by the crossover.
5. Work the hitch tight with the running end and the standing end sung against each other.
6. Be sure to leave enough rope on the end so that it does not unravel.



Army Cadet Reference Handbook

Figure B-9 Clove Hitch

The steps for tying a clove hitch using the bight are:

1. In the middle of the rope, make a crossing turn or half hitch, with the rope that comes from the left being on top (Diagram 14, Figure 1).
2. To the right of the first crossing turn, make a half hitch with exactly the same configuration (Diagram 14, Figure 2).
3. Put the right-hand half hitch on top of the left-hand half hitch (Diagram 14, Figure 3).
4. The pair of hitches are now slipped over the top of the post (Diagram 14, Figure 4).

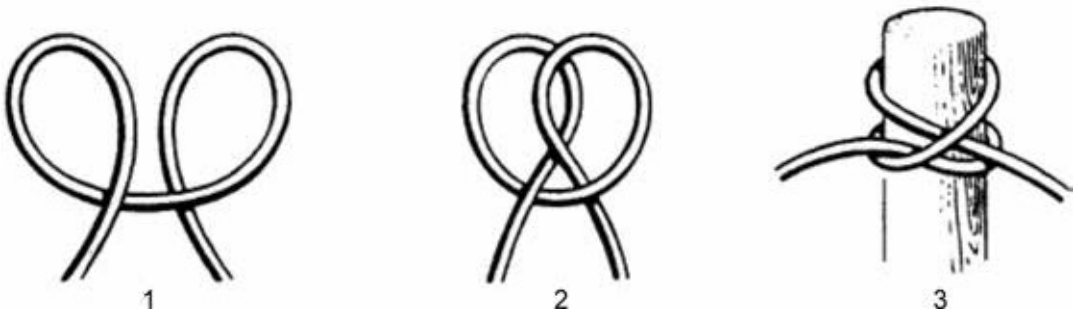


Figure B-10 Clove Hitch

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ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 4

EO M121.04 – ASSEMBLE A SURVIVAL KIT

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-701/PG-001, *Green Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

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

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to orient the cadets to the content and the maintenance of a survival kit.

INTRODUCTION

REVIEW

QUESTIONS

Q1. Backpacks can be divided into what two categories?

Q2. Name five backpack features.

Q3. Name the ABC's to packing.

ANTICIPATED ANSWERS

A1. External and internal.

A2. Any five of the following: Shoulder harness, chest strap, hip belt, inner and outer pockets, hydration system, splash cover, spindrift cover, bungee cords, and equipment straps.

A3. **A**ccessibility, **B**alance, **C**ompactness.

OBJECTIVES

By the end of this lesson the cadet shall be expected to describe the contents and assembly of a survival kit.

IMPORTANCE

A survival kit, with appropriate contents, is essential to cadets that find themselves in survival situations. Cadets are required to be familiar with this subject, and shall be able to assemble a survival kit.

Teaching Point 1 **Identify survival kit contents.**

Time: 15 min Method: Interactive Lecture

SURVIVAL KIT CONTENTS

Everyone should carry a compact survival kit when travelling or working in the wilderness, as the items in a kit may save a life in an emergency. The survival kit should be carried in the pocket, as it is possible that a person may lose their pack (voluntarily or not) in an emergency.

Divide the cadets into equal groups of four to six people to develop a list of what they believe should be contained in a survival kit. They will have five minutes to develop the list.

ACTIVITY

Time: 5 min

OBJECTIVE

- Recognize the contents of a survival kit.

RESOURCES

- Flipchart paper.
- Markers.
- Vivid imagination.

ACTIVITY LAYOUT

- The aim of the activity is to allow the cadets the opportunity to identify items that they would consider to be inside a survival kit prior to instruction of items in a survival kit.
- Activity instructions:
  - Introduce the lesson defining what a survival kit is, but not the contents thereof.
  - Divide the cadets into equal groups of four to six.
  - Provide groups with a sheet of flipchart paper and a few markers for recording.
  - Allow the cadets five minutes to determine what should be inside a survival kit.
  - Have the groups post their flipchart paper on the wall around the classroom.
  - At this point the instructor shall continue with the TP1 detailing the contents of a survival kit.
  - The goal is for the cadets to gain an understanding of what items are possible for a survival kit.

SAFETY

This is to be a supervised activity.

INSTRUCTOR GUIDELINES

Supervise the cadets giving assistance and clues if required.

The instructor is to have the cadets post their lists at the front of the classroom. The instructor shall then present the teaching point by comparing the lists developed by the cadets against the list provided below. The instructor shall highlight those that appear on both, explaining each component as it is presented.

The items from the list below that do not appear on a cadet list will be presented and explained following the comparative activity.

CONTENTS OF A SURVIVAL KIT

The contents of a survival kit should be specific to the activity being undertaken and the conditions in which that activity will take place. The contents could include items such as:

- **Candle.** Invaluable for starting a fire as well as using as a light source. Shave square for packing. If made of tallow it is also fat to eat in an emergency, or to use for frying – but be sure it is tallow; paraffin wax and some other candles are inedible. Tallow does not store well, especially in hot climates.
- **Compass.** A luminous button compass. Some small compasses can be confusing. Cadets should ensure they know how to read it before going into the field. A liquid filled type is best, but checks should be done to ensure that it does not leak, has no bubbles, and is fully serviceable. The pointer is prone to rust. Cadets should ensure that it is on its pivot and swings freely.
- **Fishhooks and Line.** A selection of different hooks in a small tin or packet. A few split lead weights should be added to the hooks. Remember that a small hook will catch both large and small fish but a large hook will only catch big ones. As much line as possible should be included, as it will also be useful for catching birds.
- **Flexible Wire Saw.** These usually come with large rings at the ends as handles. These take up too much room and should be removed; wooden toggles can replace them when needed. To protect from rust and breakage cover it in a film of grease. Flexible saws can be used to cut large trees or branches.
- **Flint.** Will work when wet and it will continue to strike long after the matches run out. A processed flint with a saw striker works best in a survival situation.
- **Magnifying Glass.** Can start a fire from direct sunshine and is useful for searching for splinters and stings.
- **Matches.** Waterproof matches are useful, but bulkier than ordinary non-safety, strike anywhere matches. These ordinary matches can be made “shower-proof” by dipping the heads in melted candle wax. To save space, snap off half of each matchstick. It is easier to use matches than to make fire by other methods; matches should not be wasted, and only used when improvised methods fail.
- **Mini Light.** Can be used at night to navigate. One set of spare batteries should be included as well.
- **Needles and Thread.** Several needles, including at least one with a very large eye that can be threaded with coarse threads. Strong thread should be chosen and wrapped around the needles.
- **Pen and Paper.** Allows one to keep notes of injuries, leave a message etc.
- **Personal Medical Kit.** Pack medicines in airtight containers with cotton wool to prevent rattling. This should be a basic kit only, as each unit should be bringing a comprehensive first aid kit with them on exercise. Mention a few common items, such as:
    - **Band-aids.** Sterile bandage helps control or stop bleeding of a small wound.
    - **Mini First Aid Pocket Guide.** For any unknown treatments when in the field, reference the guide.
    - **Moleskin.** A sheeted adhesive tape developed especially for hands and feet. Made from highly breathable non-woven fabric with ability to stretch, conform and not sweat or bathe off. The protective nap helps reduce friction and reduce calluses, and is great for holding second skin dressing in place.

- **Second Skin.** Hydro-gel dressing helps protect against blisters, pressure and friction. Helps bring cooling relief to stings, bites, poison ivy and blisters.

- **Plastic Bags.** Two large orange garbage bags for shelter and signalling.
- **Signalling Mirror.** Will draw attention by reflecting sunlight, plastic mirrors two by three inches are sufficient (other items my include compass mirror, crystal watch or a piece of foil).
- **Snare Wire.** Preferably brass wire (60 to 90 cm [two to three feet] in length). This is used for snares, but could solve many survival problems (i.e., building tools, etc.).
- **Water Sterilizing Tablets.** For use where water is not safe to drink and boiling it is not an option.
- **Whistle.** A sound-signalling device. Effective to ward off animals and signal for help.

This list is not exhaustive and is designed to give cadets choice, keeping in mind different field settings. A handout listing all contents in the survival kit covered is found at Attachment A. It is the instructors' choice whether to distribute the handout here, or at the end of the lecture.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

Q1. I can be used to signal an aeroplane. What am I?

Q2. I can provide you food in the form of fish. What am I?

ANTICIPATED ANSWERS

A1. Signal mirror.

A2. Fish hook.

Teaching Point 2 **Survival kit storage case.**

Time: 5 min Method: Interactive Lecture

The contents of a survival kit are very important. Maintaining these items and ensuring they stay dry and undamaged will require a storage vessel that is durable, waterproof, light weight. These containers may be:

Hard Plastic. Very durable, and waterproof. Try to find a case that seals once closed, may be found in any department store.

Soft Plastic. This material, depending on design, can be very durable. Tupperware most often comes with a sealable lid, and may be found in any department store.

Metal Container. Very durable, waterproof, and useful to boil water; however, may possibly rust if not a stainless steel type.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

Q1. Where can most of these items be found?

Q2. What is the purpose of a storage vessel for the survival kit?

Q3. What characteristics should a storage container have?

ANTICIPATED ANSWERS

A1. Department store.

A2. Maintains all contents in one place securely in a durable, waterproof, lightweight container.

A3. Durable, waterproof and lightweight.

Teaching Point 3 **Discuss conducting regular maintenance checks on survival kit items.**

Time: 5 min Method: Interactive Lecture

A prepared, ready to go survival kit is always a handy item; however, as time goes by it is necessary to do regular maintenance checks on the items contained inside the survival kit. The cadet should be looking for the following:

Checking Expiry Dates. Some items contained inside the survival kit will have expiry dates associated with them. It is important to do a complete review of all items periodically to ensure currencies are maintained. Expired items can do more harm than good.

Replacing Worn or Damaged Items. Over time, many items may become worn from use or be damaged. Be sure to keep stocked, and resupply the survival kit.

Replacing Missing Items. The contents of a survival kit can become cumbersome. Be sure to maintain a record of all items, complete regular inventory of contents, and replace any items that are missing as soon as possible.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS

Q1. Why should one do periodic checks of a survival kit?

Q2. What type of maintenance checks should be conducted?

Q3. When should missing items be replaced?

ANTICIPATED ANSWERS

A1. Ensure expiry dates are current; replace missing, damaged or worn items.

A2. Checking expiry dates, replacing worn or damaged items, and replacing missing items.

A3. As soon as possible.

END OF LESSON CONFIRMATION

SCENARIO:

You are going on a camping trip with friends for the weekend. You are in an area that you know well with good tree coverage, and near a water source. You can only bring five items from your survival kit. What are they?

Divide the cadets into small groups (different than the previous time).

Have the cadets, as a group, decide on the five items they would take and why.

Have a representant from each group present the list to the rest of the group.

Once every group had a chance to present their lists, ask cadet to discuss if they would keep their original list or change it, based on other groups' lists.

ANTICIPATED ANSWERS

- Will depend on the group.

CONCLUSION

HOMEWORK/READING/PRACTICE

For additional study, a matching activity sheet has been provided for the cadets, found at Attachment B, along with an answer key. Attachment A contains a glossary of terms for all material presented in the survival kit.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

The elements included in a survival kit could be essential to survival. The more that is included in the kit, the better the chances of survival.

INSTRUCTOR NOTES/REMARKS

This lesson should be delivered prior to the first time cadets enter the field.

Cadets will be required to prepare their own survival kit for the applicable field activity.

REFERENCES

C2-008 (ISBN 0-00-265314-7) Wiseman, J. (1999). *The SAS Survival Handbook.* Hammersmith, London: Harper Collins Publishers.

C2-010 (ISBN 0-375-70323-3) Rawlins, C., and Fletcher, C. (2004). *The Complete Walker IV.* New York, NY: Alfred A. Knopf.

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HANDOUT – EO M121.04 GLOSSARY

SURVIVAL KIT CONTENTS CHARACTERISTICS

- **Candle.** Invaluable for starting a fire as well as a light source. Shave square for packing. If made of tallow it is also fat to eat in an emergency or to use for frying – but be sure it is tallow; paraffin wax and some other candles are inedible. Tallow does not store well, especially in hot climates.
- **Compass.** A luminous button compass. Some small compasses can be confusing. Personnel should ensure they know how to read it before going into the field. A liquid filled type is best, but checks should be done to ensure that it does not leak, has no bubbles in it and is fully serviceable. The pointer is prone to rust. Personnel should ensure that it is on its pivot and swings freely.
- **Fishhooks and Line.** A selection of different hooks in a small tin or packet. A few split lead weights should be added to the hooks. Remember that a small hook will catch both large and small fish but a large hook will only catch big ones. As much line as possible should be included. It will also be useful for catching birds.
- **Flexible Wire Saw.** These usually come with large rings at the ends as handles. These take up too much room and should be removed; wooden toggles can replace them when needed. To protect from rust and breakage cover it in a film of grease. Flexible saws can be used to cut quite large trees or branches.
- **Flint.** Will work when wet and it will go on striking long after the matches run out. A processed flint with a saw striker works best in a survival situation.
- **Magnifying Glass.** Can start a fire from direct sunshine and is useful for searching for splinters and stings.
- **Matches.** Waterproof matches are useful but bulkier than ordinary non-safety, strike-anywhere matches, which can be made “shower-proof” by dipping the heads in melted candle wax. To save space, snap off half of each matchstick. It is easier to use matches than to make fire by other methods, matches should not be wasted and only used when improvised methods fail.
- **Mini Light.** Can be used at night to navigate. One set of spare batteries should be included as well.
- **Needles and Thread.** Several needles, including at least one with a very large eye that can be threaded with coarse threads. Strong thread should be chosen and wrapped it around the needles.
- **Pen and Paper.** Allows one to keep notes of injuries, leave a message etc.
- **Plastic Bags.** Two large orange garbage bags for shelter and signalling.
- **Signalling Mirror.** Will draw attention by reflecting sunlight, plastic mirrors two by three inches are sufficient (other items my include compass mirror, crystal watch or a piece of foil).
- **Snare Wire.** Preferably brass wire (60 to 90 cm [two to three feet] in length). This is used for snares, but could solve many survival problems (i.e. building tools, etc.).
- **Water Sterilizing Tablets.** For use where water is not safe to drink and boiling it is not an option.
- **Whistle.** A sound-signalling device. Effective to ward off animals and signal for help. Fox 40 whistle optimum.

MEDICAL KIT CHARACTERISTICS

- **Band-aids.** Sterile bandage helps control or stop bleeding of a small wound.
- **Mini First Aid Pocket Guide.** For any unknown treatments when in the field reference the guide.
- **Moleskin.** A sheeted adhesive tape developed especially for hands and feet. Made from highly breathable non-woven fabric with ability to stretch, conform and not sweat or bathe off. The protective nap helps reduce friction and reduce calluses and great for holding second skin dressing in place;
- **Second Skin.** Hydrogel dressing helps protect against blisters, pressure and friction. Helps bring cooling relief to stings, bites, poison ivy and blisters;

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SURVIVAL KIT CONTENTS MATCHING ACTIVITY

Matches	1 ☐	A. Will work when wet and it will go on striking long after the _____ runs out.
Candle	2 ☐	B. Several, including at least one with a very large eye that can be threaded with coarse threads. Strong thread should be chosen and wrapped around it.
Flint	3 ☐	C. A selection of different hooks in a small tin or packet. As much line as possible should be included.
Magnifying Glass	4 ☐	D. Illuminates the dark.
Needles and Thread	5 ☐	E. Can be used to cut quite large trees or branches.
Fishhooks and Line	6 ☐	F. The protective nap helps reduce friction and reduce calluses. Great for holding second skin dressing in place.
Compass	7 ☐	G. Can start a fire from direct sunshine and is useful for searching for splinters and stings.
Mini Light	8 ☐	H. Allows one to keep notes of injuries, leave a message etc.
Flexible Wire Saw	9 ☐	I. Invaluable for starting a fire as well as a light source. Shave square for packing.
Antihistamine	10 ☐	J. For use where water is not safe to drink and boiling it is not an option.
Whistle	11 ☐	K. Personnel should ensure they know how to read it before going into the field. A liquid filled type is best.
Pen and Paper	12 ☐	L. A sound-signalling device.
Moleskin	13 ☐	M. For allergies, insect bites and stings.
Water Sterilizing Tablets	14 ☐	N. Waterproof and are useful but bulkier than ordinary non-safety, strike-anywhere types.

SURVIVAL KIT CONTENTS MATCHING ACTIVITY

ANSWER KEY

SURVIVAL KIT	
Matches	1. N
Candle	2. I
Flint	3. A
Magnifying Glass	4. G
Needles and Thread	5. B
Fishhooks and Line	6. C
Compass	7. K
Mini Light	8. D
Flexible WIRE saw	9. E
Antihistamine	10. M
Whistle	11. O
Pen and Paper	12. H
Moleskin	13. F
Water Sterilizing Tablets	14. J

ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 5

EO M121.05 – RECOGNIZE ENVIRONMENTAL HAZARDS

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-701/PG-001, *Green Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

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

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to introduce the cadets to environmental hazards.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to identify animal behaviour, hazardous insects, and hazardous plants, and identify possible strategies for dealing with them.

IMPORTANCE

When participating in an activity in the field, it is important to know how to recognize and deal with environmental hazards in order to remain safe at all times.

Teaching Point 1 **Explain interpreting behaviour of wild animals.**

Time: 5 min Method: Interactive Lecture

ANIMAL LANGUAGE

All animals use body language to give directions and indicate to one another when they are mad or glad, relaxed or hurt. They indicate where to find food, warn others of impending danger, or remind others who is leader. Through all kinds of subtle and overt mannerisms, communication is made, even in and around peers. There are four basic messages wildlife will give off via their body language: Contentment, Submission, Alarm and Aggression.

CONTENTMENT

Contentment is defined as a satisfied state; tranquil happiness. An animal that displays contentment is not threatened by one's presence and continues to go about its business of eating, sleeping, and moving from one place to another. This behaviour is displayed similarly by most species. A deer, for example, will frequently flick its tail and ears, walk slowly - with evenly spaced steps - and lower and raise its head in an alert fashion. When around wildlife displaying this behaviour it is likely the creature is aware of one's presence, but is not likely to become aggressive unless something is done to change the dynamic.

SUBMISSION

Submission is defined as giving way; yielding. This is an expression of social courtesy and submission to others that could be interpreted as a sign of alarm. When animals move past one another, like deer and coyotes, they often lower their heads and flatten their ears, or crouch and curl their tails between their legs. These signs of submission imply "hey, everything is cool", or "let's keep the peace". Similar postures show up in other animals from wolves to wild horses.

ALARM

Alarm is defined as a warning of danger. An animal that is alarmed is not relaxed, but is suddenly alert. When an animal picks ups its ears and stares, it is showing alarm. Stress is created from being too close for comfort. When alarmed, an animal quickly stops feeding, may change direction, and if standing, it may move away or suddenly turn and face you.

Some animals have unique ways of expressing alarm; a beaver slaps its tail on the water, a deer "flags" its white tail and runs to safer ground. Skunks and rabbits beat their feet on the ground. The hair on coyote's backs goes up; they get stiffed legged, and they will tend to flatten their ears.

Alarmed animals issue warnings to others, including their kin. When witnessing these signs it is time to back off. An alarmed animal is under stress, and may become aggressive or flee their habitat when they feel these actions are critical to their survival.

AGGRESSION

Aggression is defined as the act or practice of attacking without provocation; an unprovoked attack. Sometimes, when one has failed to recognize the early warnings and has invaded an animal's space, the animal will stand its ground, becoming confrontational. Animals that become aggressive are generally protecting their young, food, or have been startled by a new presence.

To respond to such aggressive actions, one must use body language to diffuse the situation. Every move made can be interpreted as a reply. In most cases, stand tall and make yourself look big. Pick up a large stick and back away slowly. This will be interpreted by the animal to mean you are "too big to be messed with", and there is no desire to pick a fight.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

Q1. What is the definition of contentment?

Q2. What are the signs of submission from an animal?

Q3. If you came upon a moose and it stood tall, looked straight at you and grunted furiously, what sign would be present?

ANTICIPATED ANSWERS

A1. Contentment is defined as a satisfied state, tranquil happiness.

A2. Animals often lower their heads and flatten their ears or crouch and curl their tails between their legs.

A3. Aggression.

Teaching Point 2 **Discuss hazardous insects.**

Time: 10 min Method: Interactive Lecture

Biting and stinging insects are found everywhere in the wilderness. They are the most common hazard for the nature enthusiast. About 15 percent of people will react seriously to bee and wasp stings, and to insect bites. For them, an insect can produce a condition known as “anaphylactic shock,” where tissues swell extensively and can constrict the airway. Reactions can start with headaches, fever, and muscle spasms, and can develop into widespread hives, nausea, dizziness and difficult breathing.

Common insects, such as mosquitoes and ticks, carry many serious diseases such as West Nile virus, typhoid fever, dysentery, malaria and yellow fever. It is important to recognize the potentially dangerous insects, know which precautions to take, and immediate actions if stung.

SCORPIONS

Scorpions live in the grasslands found in southern Alberta and Saskatchewan and in the Okanagan Valley in British Columbia. The Canadian scorpion is a relatively innocuous variety called Pararuroctonus Boreas, which reaches one and a half inches in length. In Canada, scorpions are only active from May to September.

Only 25 species of scorpions are potentially lethal to humans, and ours is not one of them. Their sting is described as resembling that of a bee sting with a little pain and itching locally. If stung, apply a cold compress or immerse in cold water. Take an aspirin if necessary and see a physician if pain is prolonged.

http://people.uleth.ca/~dan.johnson/bws/dj_p_boreaus_cricket_400.png

Figure 1 Scorpion

MOSQUITOES

Mosquitoes carry a lot of diseases with them. When they bite a human, it may cause reactions and make people sick. Swelling and fever may result from multiple bites.

Recent studies on mosquitoes show the following:

- Mosquitoes seem to be attracted to taller people and ones that are fidgety as they exhale more carbon dioxide, which attracts mosquitoes.
- They are attracted to wet clothing and even more to clothing with perspiration. They also prefer the colour blue.
- Mosquitoes can detect humans from as far away as six metres. They are attracted by heat, moisture and carbon dioxide. All of these factors are increased when moving a lot on a warm day.
- Upon biting, the mosquito injects saliva into the body to help extract the blood. This saliva causes the itching.

TICKS

Ticks can cause irritation and, in some cases, carry harmful germs. They are flat-bodied and round, with a small biting head that eats into a wound.

SAS Survival Guide, by John Wiseman, 1999

Figure 2 Tick

Hikers and walkers must check their legs daily for ticks embedded in the skin. If one is found, the following should be done:

1. use heat, oil, petroleum jelly, alcohol, nail polish or hot water to make the tick drop off. This will prevent the tick from breathing and it will release its hold immediately;
2. if the tick does not come off, leave the oil on for half an hour and use a pair of tweezers to remove it by pinching as close to the skin as possible, pulling gently. Do not use fingers to pull it out; and
3. wash the area with water and soap.

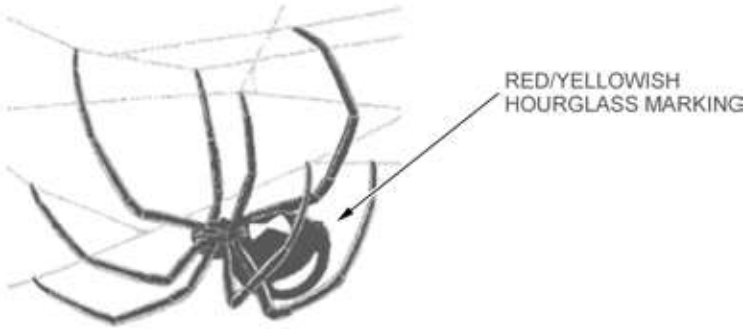
SPIDERS

Though most spiders are venomous and considered predators, of the thousands of species found in Canada, few are actually considered a health threat. In fact, spiders are actually helpful in controlling other pests in the home or garden since they feed on other insects and spiders. They generally bite and inject venom into their prey. Spiders however, rarely bite humans. The venom of most species is not very toxic to humans, usually resulting in no more than a slight swelling, inflammation, or itching sensation. In Canada, the two spiders that can be a health risk are the black widow and the brown recluse.

Black widow spider

Black widow spiders have a dark brown to glossy black body. However, the young black widows are white in colour. When their legs are extended, they have a size of 2.54 x 3.81 cm. The female is extremely poisonous. She has a red or yellow hourglass marking on the underside of the abdomen (see Figure 3). The male does not have this marking and is smaller.

Black widows are usually found outdoors in sheds, outhouses, under stones, logs, in hollow stumps, and sometimes indoors in dark corners of garages, rock walls, barns or woodpiles. Their web is distinctive. The strands of silk run in many directions so the web appears as a concentration of irregularly arranged threads. The silk strand of the web is considerably heavier and stronger than those of other species that form similarly shaped webs.



http://desertmuseum.org

Figure 3 Female Black Widow

The female black widows will bite when handled or accidentally touched. Their bites produce local redness with two tiny red spots, severe pain, sweating, shivering, nausea and weakness. The victim could even writhe in agony and have difficulty talking and breathing. It is rarely fatal, but can disable the victim for up to a week. The venom's effect will occur in about 30 minutes and attacks the nervous system. Serum is needed to counteract the black widow's venom.

When travelling to the doctor's, keep the victim calm and apply an antiseptic to the sting area. Place an ice pack around the bite area to slow the spread of the venom.

Wearing leather gloves when working around potential black widow habitats will help avoid getting bitten.

BEES

Bees are a venomous, stinging, social insect that are abundant in urban areas. When nests are disturbed, bees will get defensive and can inflict multiple stings.

Honeybees are less aggressive, as they live in well-protected hollow trees and other cavities. They do not have to protect their nests, so they do not have to be aggressive and sting as frequently to protect their home. This type of bee stings only once, as the barbed stinger will stay embedded in the skin. The stinger embedded in the skin must be removed as soon as possible as the venom sac will continue to pump for two to three minutes driving the venom deeper into the skin. The best way to remove the stinger is to scrape it out with a fingernail, as this will avoid squeezing the venom sac.

African bees make nests in the openings of tree branches and in holes in the ground. Their nests are vulnerable to attack and they have to fight potential predators. For this reason, they are easily provoked and highly defensive. They respond more quickly, stay agitated longer, and chase enemies further, than European bees. The sting of a single African bee is no more dangerous than the one of other honey bees but the massive attack of hundreds of bees and hundreds of stings can prove fatal. African bees are sometimes referred to as "killer bees."

African bees look like other honeybees but they are slightly smaller, weigh less, and have shorter stingers and forewings. They are more nervous in their hives, and fly farther and in a more zigzag pattern than European bees.

WASPS

There are several varieties of wasps in North America, including the yellow jacket, hornet and paper wasp. Colour ranges from black to combinations of black with yellow, white or brown markings. The slim winged body measures 10 to 19 mm. All wasps species have chewing mouthparts and the females possess a stinger.

www.abellgroup.com

Figure 4 Wasp

Nests can be found around buildings, on verandas, under eaves, ceilings, attics or in trees and shrubs. Several varieties of wasps build nests under ground. Wasps are very protective of their nest and, though they will use the nest for only one season, it can contain as many as 10 000 to 30 000 individuals.

As bees do, wasps inject venom under the skin. Wasps have smoother stingers than bees and so can sting numerous times. Their sting produces a few minutes of fierce burning, followed by redness and itching at the point of the sting. A welt may form and subside in three or four hours. A wasp sting, aside from being very painful, can prove serious and sometimes fatal.

If a wasp stings someone, the sting area must be washed with water and soap. If the stinger and venom sac remain in the wound, a fingernail or knife blade can be used to scrape them out. The sting area should be washed again.

AVOIDING INSECTS

Most insects are a nuisance rather than a danger. When bothered by insects like mosquitoes, black flies, deer flies, or chiggers, hikers have several options available to thwart such nuisances, and reduce exposure by controlling their surroundings. Try and avoid camping areas with tall grass, weeds and standing water where insects are abundant.

Preventive measures to avoid insects:

Clothing and Scents

- Avoid wearing brightly coloured clothing as it will attract insects. Wear pale colour clothing and fabrics.
- Cover up as much of the body as possible.
- Limit the use of fragrances (i.e., colognes, perfumes, deodorant, shampoos, etc.), as insects are attracted to them. Use fragrance-free soap and detergent.

Insect Repellents

Apply insect repellents such to ward off unwanted insects. These repellents should be applied to the exposed areas of the body. Many insect repellents rely on chemicals to repel insects and have effective durations per application.

Product effectiveness:

- **DEET:** Protects from bites for a period of two to six hours. Generally, the higher the concentration of DEET the longer the protection; however, use of a produce with more than 30 percent DEET is unlikely to yield any benefit.
- **P-Methane 3,8 Diol:** Provides up to two hours of protection. Not to be used by children under three years of age.
- **Soybean Oil:** Provides between one and three and one half hours of protection.

WARNING
DEET in high concentrations can be harmful to a person's health, specifically the nervous system.
NOTE
Health Canada recommends: • Children under six months are NOT to use insect repellents containing DEET. • Children aged six months to two years are NOT to use insect repellents containing DEET. • Children between 2 to 12 years: Apply no more than three times a day using the lowest concentration of DEET (10 percent or less). • Individuals 12 years or older: Apply insect repellents containing no more than 30 percent DEET.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

Q1. Why is it important to be protected against insects?

Q2. What can be used to remove ticks from skin?

Q3. How can the female black widow be recognized?

Q4. What is the remedy for a black widow bite?

Q5. What marking makes the brown recluse spider stand out amongst other spiders?

Q6. What precautions can be taken in order to prevent being bitten by a brown recluse?

Q7. What percentage of DEET can cadets use?

ANTICIPATED ANSWERS

A1. Some people will react seriously to stings and bites. Insects can also carry serious diseases.

A2. Heat, oil, petroleum jelly, alcohol, nail polish, hot water.

A3. She has a red or yellow hourglass marking on the underside of the abdomen.

A4. Serum (anti-venom).

A5. It has a distinctive fiddle-shaped mark on its back.

A6. Shake out unworn or stored shoes and clothes before wearing. Check bed linens of unoccupied beds. Wear leather gloves when working around potential habitats.

A7. 12 years old, apply no more than three times a day using the lowest concentration of DEET (10 percent or less). Individuals 12 years or older, apply insect repellents containing no more than 30 percent DEET.

Teaching Point 3 **Explain how to identify poisonous plants.**

Time: 10 min Method: Interactive Lecture

POISON IVY

Poison ivy is present in every province except Newfoundland and Labrador, and occurs on sandy, stony, or rocky shores of streams, rivers and lakes. It sprouts in thickets, along the borders of woods and in wood openings.

Characteristics

- glossy plant;
- grows as a:
  - trailing vine, a sub-shrub 5 to 120 cm high; and
  - aerial-rooted vine that climbs rough surfaces to 15 m;
- leaves consist of three leaflets with the middle one having a stalk longer than the other two; and

www.cwss-scm.ca/weeds/images/F22_centralPoidonIvy.jpg

Figure 5 Poison Ivy

- leaves alternate in colour and are reddish in the spring, green in the summer and are various shades of red, yellow, orange or bronze in fall.

POISON SUMAC

Poison sumac is found in some of the wooded swamps of southern Ontario and southern Quebec. It is a tall shrub or small tree with 6 to 12 leaflets arranged in pairs and an additional single leaflet at the end. The small yellowish green flowers, born in clusters, mature into whitish-green fruits that hang in loose clusters 10 to 30 m in length.

http://res2.agr.gc.ca/ecorc/poison/vernix_e.htm

Figure 6 Poison Sumac

http://res2.agr.gc.ca/ecorc/poison/vernix_e.htm

Figure 7 Poison Sumac

http://res2.agr.gc.ca/ecorc/poison/vernix_e.htm

Figure 8 Poison Sumac With White Berries

POISON OAK

Poison oak is found only in western Canada. It grows as a bush, vine root and shrub-like forms, It has leaves divided into three leaflets that are roughly edged and densely haired. The white berry-like fruits are also haired. Poison oak continually changes colours corresponding with the seasons; red in spring, green in summer and red/bronze in the fall.

www.knowledge.org/oak/identify.html

Figure 9 Poison Oak

www.odsu.com/images/poioak1b.jpg

Figure 10 Poison Oak

www.coloma.com/reference/401-1-18-poisonoak.jpg

Figure 11 Poison Oak

Infected Symptoms

The symptoms of the allergic reaction to exposure to poison ivy, sumac, and oak are similar, they are:

- severe itching of the skin;
- red inflammation and blistering of the skin; and
- in severe cases, oozing blisters develop.

Wash infected skin as soon as possible with cold water to minimize severity of the rash and prevent the spread of the sap to uninfected parts of the body. Although extremely irritating, most cases disappear within a week to 10 days. Relief may be found through the application of medication such as calamine lotion, which is available in most drug stores.

Poison Ivy is treatable with a natural herbal remedy. When in the field and you have been exposed to poison ivy, oak, or sumac, locate a plant called jewelweed (preferable orange jewelweed not yellow). To apply jewelweed as a remedy, slice the stem then rub its juicy inside on exposed parts, this will promptly ease irritation and usually prevents breakouts.

www.westol.com/~banding/jewelweed-090602.jpg

Figure 12 Orange Jewelweed

www.donwiss.com/pictures/F-2001-07-0410019.jpg

Figure 13 Jewelweed

www.naturealmanac.xom/natural_events/j/jewelweed.jpg

Figure 14 Orange Jewelweed

CONFIRMATION OF TEACHING POINT 3

QUESTIONS

Q1. What three poison plants are found in Canada?

Q2. What are the symptoms that a person has come into contact with a poisonous plant?

Q3. What is the name of the plant that can be used as an herbal remedy to treat an exposed person?

ANTICIPATED ANSWERS

A1. Poison ivy, poison oak, and poison sumac.

A2. Severe itching of the skin, red inflammation and blistering of the skin. In severe cases, oozing blisters develop.

A3. Jewelweed.

END OF LESSON CONFIRMATION

QUESTIONS

Q1. Why is it important to be protected against insects?

Q2. What can be used to remove ticks from skin?

Q3. How can the female black widow be recognized?

Q4. What three poisons plants are found in Canada?

Q5. What are the symptoms that a person has come into contact with a poisonous plant?

ANTICIPATED ANSWERS

A1. Because some people will react seriously to stings and bites. Insects can carry serious diseases.

A2. Heat, oil, petroleum jelly, alcohol, nail polish and hot water.

A3. She has a red or yellow hourglass marking on the underside of the abdomen.

A4. Poison ivy, poison oak, and poison sumac.

A5. Severe itching of the skin, Red inflammation and blistering of the skin. In severe cases, oozing blisters develop.

CONCLUSION

HOMEWORK/READING/PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

It is important for everyone who participates in field training to know how to recognize and deal with dangerous animals, insects, and poisonous plants, in order to ensure the safety of all participants.

INSTRUCTOR NOTES/REMARKS

This lesson should be delivered prior to the bivouac exercise.

REFERENCES

C2-004 (ISBN 1-896713-00-9) Tawrell, P. (1996). *Camping and Wilderness Survival: The Ultimate Outdoors Book.* Green Valley, ON: Paul Tawrell.

C2-008 (ISBN 0-00-265314-7) Wiseman, J. (1999). *The SAS Survival Handbook.* Hammersmith, London: Harper Collins Publishers.

C2-032 Curtis, S. (1998, September). *Watch your Language.* Retrieved 25 May 2006, from http://www.backpacker.com/article/1,2646,135_article,00.html.

ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 6

EO M121.06 – IDENTIFY ENVIRONMENTAL INJURIES

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-701/PG-001, *Green Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

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

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to introduce the cadets to environmental injuries.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

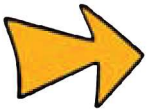
By the end of the lesson the cadet shall be expected to recognize the effects that hot and cold weather may have on the body, and how to identify and prevent environmental injuries.

IMPORTANCE

Cadets need to know how to recognize hot-and-cold weather dangers and treatment of these effects. Knowing how to properly identify various hot-and-cold related injuries and take proper preventative measures will ensure a safe, fun and meaningful training experience in any weather conditions.

Teaching Point 1 **Explain how to identify cold-related injuries.**

Time: 15 min Method: Interactive Lecture



This teaching point contains substantial background information to be used by the instructor in the development of a lesson plan. During delivery, the emphasis shall be placed on the **preventative** measures detailed throughout. A detailed discussion of cold weather injuries is provided in EO C121.04 (Section 13).

FROSTBITE

Frostbite is the freezing of tissue in the body. As blood flow slows down, the fluid between cells can freeze. As ice crystals form on them, the cells become dehydrated. Frostbite acts locally on parts of the body such as fingers, toes, chin, nose and ears. It is a constant hazard during activities occurring in sub-zero temperatures, especially when accompanied by strong winds.

Signs and symptoms of frostbite stages:

Surface Frostbite. Also known as superficial frostbite or frostnip, it affects only the skin and causes little damage. Only the outer layer of the skin is frozen. It may occur from contact with cold metal or severe wind chill. After the nipped area is warmed, the layer of frozen skin becomes red, and after a few days, the skin will peel, looking similar to sunburn. Signs and symptoms include:

- skin turns white and numb;
- tissues beneath the affected area are still soft;
- casualty may not feel it; and
- may notice white spot.

Deep Frostbite. Frostnip has progressed into underlying tissue. It may feel hard on the surface, and soft below. Blisters will usually appear within 24 hours of warming. It needs proper warming, not just an application of heat. If it progresses even further, the injury extends into deeper tissue and into the muscle. Blisters containing fluid, blood-filled blisters, delayed blisters or lack of blisters forming within 48 hours of warming indicate deep frostbite. It may cause loss of tissue and permanent damage, including the loss of parts, or all of the affected area. Proper field care can often mean the difference between temporary disabilities and permanent injuries.

Signs and symptoms include:

- pain or numbness in the fingers, toes, heels, and entire hands and feet;
- tissue is hard all around the affected area;
- the frostbitten part is cold and white (sometimes purple); and
- no pain, or feeling of any kind, in the extremity that is frozen.

Prevention

Surface. Is common on the face and is associated with naturally occurring wind, or wind from a moving vehicle. A good parka tunnel will usually prevent frostbite because it holds a pocket of warm air around the face. In strong winds, cover the nose and cheeks with a face mask, scarf, or any piece of warm fabric. Since frostbite is often not felt, the first warning may come from a companion who notices a white spot on your face. Frostbite is also common on the hands if doing work, or if coming into direct contact with cold metal.

Deep. Often occurs when exposed to freezing temperatures with no chance to warm-up, or when hands and feet become wet and freeze. It is important to eat often to maintain body warmth, drink often to avoid dehydration, and rest enough to avoid fatigue while restoring circulation. Warm numb and painful feet immediately.

Treatment

Do not use snow, oil, rubbing, massage or pressure.

Surface. Serves as a warning. A frozen nose is the most common type of surface frostbite. Most minor frostbite can usually be thawed with body heat. Place a warm palm against a frostbitten cheek or ear, and place frostbitten hands against your chest, between your thighs, or under your armpits. Surface frostbite that produces blisters may require the casualty to be evacuated for medical attention.

Deep. Remove all constricting clothing such as boots, gloves or socks, without causing further damage to the frostbitten area. The frozen part should be placed against an unfrozen part of the body or exposed to warm air. Rapid thawing by the application of external heat is the safest way to relieve frostbite. Clean and dress the area to avoid infection. Do not exercise the injured person, or warm them in front of an open fire. Seek immediate medical attention.

SIGNS AND SYMPTOMS OF HYPOTHERMIA

Cold exposure, or hypothermia, is the drop of the vital core temperature of the body. Exposure can be divided into three levels – mild, moderate and severe. It is hard to tell where one level starts and the next stops without a special thermometer.

Signs and symptoms of hypothermia stages:

Mild Exposure. During mild exposure the casualty:

- is awake;
- shivering;
- can answer questions intelligently;
- may be slurring their speech;
- is losing interest in what they are doing; and
- is complaining that they are cold.

Moderate Exposure. During moderate exposure the casualty:

- is confused and illogical;
- does not want to move much, and may be sleepy;
- is clumsy and stumbles;
- stops shivering;
- shows signs of muscle stiffness;
- has slow breath and pulse rates;
- may have a fruity odour to their breath;
- may have dilated pupils; and
- may urinate in clothing.

The casualty is in great danger and is close to severe hypothermia, unconsciousness and death.

Severe Exposure. Moderate exposure quickly becomes severe exposure. At this point the casualty is in a coma, and is close to death. In severe exposure, the casualty:

- is barely conscious;
- has slow, shallow breathing and a weak, slow, irregular or absent pulse; and
- has pale, very cold, perhaps bluish skin.

During this time, the casualty will appear dead. It is important to remember that though they may look dead, there still may be a faint pulse, and some respiration. You can not determine if someone is dead until the body has warmed up and there is still no sign of life.

Prevention

There are a number of things a person can do to help prevent exposure:

- prepare for the worst and take extra clothing;
- avoid overheating and sweating. Wear loose, layered clothing that breathes. Cotton wets easily and dries slowly. Wool is warm, even when wet, and modern fabrics such as polypropylene and polyester are superior next to the skin;
- avoid long term cooling. Take breaks for hot drinks, and try to get out of the wind. Do not continue on if you are getting seriously cold;
- eat often to provide fuel for your body. Sugars and starches work most quickly;
- drink lots. Dehydration is a major contributor to exposure. Hot, sweet drinks are best, but you can also drink cold water. Do not eat snow if you are cold;
- keep your big muscles moving. This creates heat. Keep wiggling your toes and fingers if they are cold. Wiggling them will not warm you up too much, but moving the larger muscles of the arms and legs will. Swing your arms vigorously, and place the hands in the armpits; and
- check your companions often. If they get clumsy, start to shiver, slur their speech, or act strangely, you can suspect exposure. Remember that people suffering from exposure do not always feel it.

Treatments

Mild Exposure. If you think that your companion is suffering from mild exposure, you should:

- stop travelling;
- prevent any further loss of body heat;
- get them into shelter;
- replace any wet clothing;
- allow shivering to continue as it is the body trying to warm up; and
- give them food and hot drinks.

Rewarming with skin-to-skin contact or sleeping bags is the best way to help the person.

Moderate Exposure. If the casualty is suffering from moderate exposure, treat them for mild exposure, except:

- avoid rough handling and do not let them walk; and
- do not give fluids to drink until they are awake and understand what is going on. This will prevent choking.

Never handle anyone in moderate exposure roughly, or allow them to move much, as this affects the heart and can cause it to fail quickly.

Severe Exposure. There must be medical treatment at this time. There is some treatment that you can give to a casualty showing signs of severe exposure. They are:

If there is any breathing or a pulse, you should:

- handle the casualty very gently;
- prevent further heat loss; and
- move them gently to medical care.

If medical attention is not available, and you are far from help, you should:

- immediately and gently move them into warm shelter;
- apply heavily wrapped warm water bottles to sides of their neck, chest, and groin. Do not put them anywhere else; and
- keep them warm and let them recover very slowly without moving them.

It is very important that the water bottles be only slightly warm, as too much heat will damage the skin. Do not rub the hands, feet, or legs or move them if you do not have to. If the casualty recovers, the hearing is the first to return, then the sight. They may then lose control of their bowels.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

Q1. What is the most common type of superficial frostbite?

Q2. What are the three types of exposure?

Q3. What are some things you can do to prevent exposure?

ANTICIPATED ANSWERS

A1. A frozen nose.

A2. Mild, moderate and severe.

A3. Any of the following: take extra clothing, avoid sweating and long term cooling, eat often, drink lots, keep active, and check each other often.

Teaching Point 2 **Explain how to identify heat-related injuries.**

Time: 10 min Method: Interactive Lecture

HEAT CRAMPS

The instructor shall present the following information, with emphasis being placed on the treatment and prevention of the various ailments. The instructor should remember, when planning the lesson, to emphasize the importance of notifying a supervisor or senior cadet of any signs or symptoms being noticed.

Heat cramps are caused by the loss of salt during excessive sweating, as a result of a failure of the natural cooling mechanisms in the body to control the body's temperature. This is a warning sign of heat exhaustion, and occurs in the muscles doing the most work, such as the arms, legs and abdomen.

Symptoms:

- Shallow breathing.
- Vomiting.
- Dizziness.

Treatment:

- Move to shade.
- Rest.
- Drink water with a little salt dissolved in it (only a pinch to a half litre).

HEAT EXHAUSTION

Heat exhaustion is caused by exposure to high temperatures and humidity, with loss of body fluids through excessive sweating. It can occur without direct exposure to the sun; just being in a hot building with poor ventilation may cause it.

Symptoms:

- Pale face.
- Cold sweaty skin.
- Weak pulse.
- Dizziness.
- Weakness and possible cramps.

Treatments:

- Move to shade.
- Rest.
- Drink water with a little salt dissolved in it (only a pinch to a half litre).

HEATSTROKE

Heatstroke is caused by the failure of the brain to regulate the heat mechanisms of the body, and will cause a cessation of sweating (cooling). Heatstroke can occur after a few hours of exposure to intense heat, but usually occurs after a few days of prolonged exposure (i.e. heat wave, or a holiday in the tropics). People from temperate climates who have not had a chance to acclimatize are at a higher risk of being affected. During strenuous activities and high temperatures the chances of heatstroke occurring are increased.

Symptoms:

- Hot dry skin.
- Flushed face and feverish (sweating stops).
- Rise in temperature.
- Pulse is rapid and strong.
- Severe headache, often with vomiting.
- Unconsciousness may follow.

Treatments:

- Lay in the shade with head and shoulders slightly raised.
- Remove outer clothing, cool body by wetting underclothing with TEPID water (cold water may push the core temperature up) and fanning.
- Spray or sprinkle water over casualty.
- Causality should be placed in a cool damp area with plenty of ventilation.
- When consciousness returns give water to drink.
- When temperature returns to normal replace clothing, and keep warm to prevent chill.

SUNBURN

Sunburn occurs when skin is burned by 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. The best prevention for sunburn is to remain covered as much as possible, and to apply sunscreen with a SPF rating of 29 or higher to exposed skin.

Sunburn in a very light skinned person may occur in less than 15 minutes of midday sun exposure, while a dark skinned person may tolerate the same exposure for hours. Actual sunburn, with blisters, is a real danger, especially with pale and sensitive skin types. If more than two thirds of the body is affected it can prove fatal.

Treatment:

- avoid further exposure;
- keep in the shade;
- cover all blisters with dressings (DO NOT BURST); and
- seek medical assistance.

SORE EYES

Sore eyes may be due to glare. This is more common when on a lake or ocean, in the desert, or on snow covered locations. It is caused by overexposure to the sun or dust particles.

Treatment:

- rest in the shade;
- cover eyes after washing out foreign objects;
- use a mask and darken below eyes with charcoal to avoid recurrence; and
- wear sunglasses.

DEHYDRATION

Dehydration is a condition that occurs when a person loses more fluids than they consume. The human body is made up of about two thirds water and when someone gets dehydrated, it means the amount of water in the body has dropped below the level needed for normal body function (low fuel).

To avoid dehydration one must drink plenty of water. It is recommended that a person drink 1.2 litres (six to eight glasses) of water every day. When exercising consumption of water should increase to one litre of water per hour of exercise on top of the normal daily amount. Water intake should also be increased if exercising in warmer conditions or during hotter weather periods as one will sweat more and lose fluid from the body.

Results and Symptoms of Fluid Loss:

Fluid Loss 1 to 5 percent	Fluid Loss 6 to 10 percent	Fluid Loss 11 to 20 percent
• Thirst • Vague discomfort • Lack of appetite • Flushed skin • Impatience • Sleepiness • Nausea	• Dizziness • Headache • Laboured breathing • No saliva • Indistinct speech • Unable to walk	• Delirium/disorientated • Swollen tongue • Unable to swallow • Dim vision • Numbed and shrivelled skin

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

Q1. What are three heat related injuries?

Q2. If you were exposed to ultraviolet light for a prolonged period of time, what would occur?

Q3. What are the symptoms of heat stroke?

ANTICIPATED ANSWERS

A1. Heatstroke, dehydration, heat exhaustion.

A2. Sunburn.

A3. Hot dry skin, flushed face and feverish (sweating stops), rise in temperature, pulse rapid and strong, severe headache, often with vomiting, unconsciousness may follow.

END OF LESSON CONFIRMATION

QUESTIONS

Q1. Describe the preventative steps to take to avoid exposure to hyperthermia?

Q2. How can a cadet avoid dehydration?

Q3. How can a cadet prevent sunburn?

ANTICIPATED ANSWERS

A1. Any of the following: take extra clothing, avoid sweating and long-term cooling, eat often, drink plenty of water, keep active, and check each other often.

A2. To avoid dehydration one must drink plenty of water. It is recommended that a person drink 1.2 litres (six to eight glasses) of water every day. When exercising, consumption of water should increase to one litre of water per hour of exercise on top of the normal daily amount. Water intake should also be increased if exercising in warmer conditions or during hotter weather periods as one will sweat more and lose fluid from the body.

A3. The best prevention for sunburn is to remain covered as much as possible, and to apply sunscreen with a minimum SPF rating of 30 to any exposed skin.

CONCLUSION

HOMEWORK/READING/PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Cadets should now be better prepared to recognize environmental related injuries, and injuries to which they are susceptible while participating in field training exercises in any season.

INSTRUCTOR NOTES/REMARKS

This lesson should be delivered prior to the bivouac exercise.

REFERENCES

C2-004 (ISBN 1-896713-00-9) Tawrell, P. (1996). *Camping and Wilderness Survival: The Ultimate Outdoors Book.* Green Valley, ON: Paul Tawrell.

C2-008 (ISBN 0-00-265314-7) Wiseman, J. (1999). *The SAS Survival Handbook.* Hammersmith, London: Harper Collins Publishers.

C2-009 (ISBN 0-684-85909-2) Harvey, M. (1999). *The National Outdoor Leadership School's Wilderness Guide.* New York, NY: Fireside.

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ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 7

EO M121.07 – ERECT A GROUP TENT

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-701/PG-001, *Green Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

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

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

A demonstration was chosen for TPs 1 and 3 as it allows the instructor to demonstrate the process of erecting and striking a tent in a controlled environment.

A performance was chosen for TPs 2 and 4 as it allows cadets the opportunity to practice erecting and striking a tent under supervision.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to erect a tent as a member of a group and organize their personal tent space.

IMPORTANCE

Shelters are important to protect cadets against weather and offer sleep areas. Ineffective shelters will hamper training and put cadets at risk.

Teaching Point 1 **Introduce tents.**

Time: 15 min Method: Demonstration

Cadets will use commercial tents, which come in various sizes and forms, and therefore have different materials and ways to be erected. Instructors and users should read the information booklets provided with the tent used in order to become familiar with how to erect it.

TENT INFORMATION

Modern tent styles include dome, tunnel and ridge (or A-frame) designs. Tents are rated as either a three-season or a four-season shelter. Three-season tents are designed to offer good ventilation in spring, summer and fall, and provide sturdy weather protection in everything but heavy snowfalls and very high winds. Many three-season tents have mesh inner bodies, which reduce condensation, and can often be used without the fly for a cool, bug-proof shelter on hot nights. Three-season tents are airier, less expensive, lighter and more compact or roomier than four-season tents. Their versatility makes them popular with backpackers, paddlers and cyclists. A four-season tent is made of stronger materials and is designed to withstand strong winds and for use in cold environments. For backpacking expeditions, choose a tent or shelter that offers sufficient protection for a person and their kit. No tent or shelter is fireproof, so use extreme caution with an open flame.

Each tent will be rated for the number of people that are supposed to fit in the tent to sleep. Tents, when purchased, should be chosen and rated for at least one more person than planned allowing room for kit. Some tents have a small sheltered area at the door, called a vestibule, to allow a storage area for kit.

Some tents use a separate “fly” (a waterproof tarp that fits over the tent) to keep you dry, while others have just a single wall and roof with waterproof qualities. All tents must be dried completely before long term storage.

PARTS OF A TENT

www.mec.ca/tarn3

Figure 1 Sample Tent with Labelled Parts (No Guy Lines)

Pre-made shelters come in many styles, sizes, shapes and materials. Most will use some common items such as:

- Poles (aluminium, carbon fibre or fibreglass). These are to be used to support the material portions of the tent;
- Guy lines (for support). These may be constructed from a lightweight, water-resistant material, and are stretched out from the material of the tent to lend shape and stability to the tent;
- The proper tent. Tents and shelters are traditionally made from nylon, polyester, canvas or cotton material, and are often one large piece, into which poles etc., are inserted;
- Pegs. Some tents require pegs to be driven into the ground for additional support of the tent structure, or to hold the ends of the guy lines; and
- The fly. Many tents utilize a fly in order to provide additional weatherproofing. Often flies provide a vestibule, or compartment at the front or rear door to the tent, in which an additional kit can be stored.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

Q1. What size tent should be used if planning on sleeping two persons with kit?

Q2. What seasons are tents rated for and what is the difference between the two?

Q3. What is the tarp-like material called that fits over the top of a tent?

ANTICIPATED ANSWERS

A1. Three person if planning on storing a kit inside.

A2. Three-season and four-season tents. Three-season tents are made for spring summer and fall, four season are made of stronger materials and are designed to withstand strong winds and be used in cold environments.

A3. Fly.

Teaching Point 2 **Explain and demonstrate erecting a tent.**

Time: 20 min Method: Demonstration and Performance

PITCHING AND ANCHORING

Pitching (erecting)

- Instructors are to show the cadets how to erect the commercial tent that is being employed by the cadet unit.
- Gather cadets in an appropriate location and go through the erection of the commercial tent, step by step as set out in the manufactures instructions.

Keep in mind the following points when pitching a tent:

- find a sheltered area;
- avoid overhanging tree branches and other overhead hazards;
- avoid areas in the radius of any dead trees in case the wind or other environmental factor topples them;

- avoid open hilltops giving exposure to wind and lightning;
- avoid depressions where water might pool after rainfall;
- ensure you are at least 100 m from your cooking area (bears and other animals will be attracted to food smells);
- orient the opening of the shelter away from the wind;
- ensure sleeping surface is cleared of any sharp objects, large twigs and rocks; and
- never pitch a shelter on a road or path.

To lessen the impact on the environment and other wilderness users:

- ensure you are at least 100 m from open water – local wildlife relies on water access for survival and your presence at the water's edge may interrupt their habits;
- select a shelter site out of the direct view of other wilderness users – at least 10 m from a trail, path or road; and
- erect the shelter on a durable surface like sand, rock or grass – fragile plant life may be permanently damaged by use of the area. Avoid moving large stones and branches.

When pitching, the strength of a tent depends on the construction, design and quality. Equally a great deal of strength is achieved when a tent is properly pitched. A tightly pitched tent is stronger, more aerodynamic, keeps drier in a storm, and lasts longer than a loose and sagging tent. When pitching ensure to:

- stake tent ensuring all cords are taut (having no slack or give); and
- make tent and fly taut with all various tie downs provided.

A taut tent is stronger, and sheds rain and snow more effectively.

ACTIVITY – ERECT A PERSONAL TENT

OBJECTIVE

- This activity's objective is to have the cadets erect a tent with a properly laid out tent space.

RESOURCES

- Tents.
- Personal kit (backpack and material contained within).
- Sleeping bags.
- Air mattresses.

ACTIVITY LAYOUT

This activity will be run as a competition, similar in nature to the principles of a game. The cadets will be challenged to completely set up a tent, and organize their tent space, in 40 minutes. The instructions are as follows:

- cadets will be assigned to tent groups corresponding to the number of persons a provided tent can hold. These shall be the groups in which the cadets will be sleeping for the duration of the FTX;

- the cadet tent groups will be assigned a tent site location as determined prior to this lesson;
- cadets will erect tents according to the manufacturer's instructions as discussed in TP1;
- once cadets have been assigned tent groups and tent locations (as previously determined), explain to the cadets that there will be a small challenge on tent construction;
- cadets will be given a time limit of 15 minutes to erect a tent and set up their tent space;
- the instructor will continuously supervise cadets throughout this teaching point, giving direction where required; and
- assistance and supervision from other staff may be required, and is encouraged.

SAFETY

- Cadets are to be supervised throughout this lesson.
- Ensure that if any tools (i.e. axes, knives, hammers) are to be used, it is done with direct supervision.

INSTRUCTOR GUIDELINES

- During this activity the instructor must continually supervise the cadets.
- Constantly be aware of what is happening at the tent sites.
- Assist cadets experiencing difficulties, keeping in mind this is a competition.
- Once time has expired, assess the tents to see which group has the best completed shelter (see TP2 – Confirmation, for details on assessment criteria).
- Once winners have been determined, be creative and reward the cadets.

CONFIRMATION OF TEACHING POINT 2

Tent assessment criteria:

- sleeping surface clear, void of any sharp objects that could be a danger to the tent; and
- tent is set up according to manufacturer's instructions, ensuring:
  - pegs are holding the tent to the ground, and in proper locations relative to the tent;
  - guy lines are taut and placed in a safe location, contributing to the overall strength of the tent;
  - poles are fully assembled and secured; and
  - any other criteria detailed in TP2 that may be applicable.

Teaching Point 3 **Explain and demonstrate striking a tent.**

Time: 5 min Method: Demonstration and Performance

TENT SPACE

Where pre-made shelters come in many styles, sizes, and shapes, it is difficult to specify one particular tent space layout that is conducive to all types; however, there are a few common guidelines all campers should follow:

- during warm or clear days, the tent doors are left open to allow air to flow through (fly is closed);
- air mattress is laid out in tent if self inflating, allow time for air to fill mattress;

- sleeping bag left rolled up until prior to sleeping if a down sleeping bag is used, allow time for bag to fluff and fill with air;
- maintain a clean space, as dirt or other objects may tear the tent;
- kit is stored at the foot of tent or outside under a tarp;
- remove footwear upon entry (reduces dirt and water inside the tent); and
- do not store food inside a tent.

CONFIRMATION OF TEACHING POINT 3

The instructor shall have the cadets organize their bed space, and shall correct errors as soon as possible. The bed space shall be assessed by the instructor, ensuring:

- the sleeping space is tidy and properly laid out;
- the air mattress is laid out flat, with self-inflating valve open, allowing air to fill;
- sleeping bag is still stored; and
- any other criteria from TP3 are considered, as applicable.

The instructor may end the lesson at this point, and have the cadets carry on with other activities, in accordance with the training schedule for the FTX. TP4 may be scheduled to take place at the end of the FTX, as part of site teardown.

Teaching Point 4 **Striking.**

Time: 20 min Method: Demonstration and Performance

The instructor shall demonstrate the complete process for removing a tent from a campsite, or **striking** the tent. The cadets shall then strike their tents, under supervision, while the instructor provides feedback.

STRIKING

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 leftover garbage.

Where time permits, corps may choose to include a similar activity to that presented in TP2.

FOLDING AND STORAGE

Pre-made shelters come in many styles, sizes, and shapes with different materials. For proper folding of the tent follow the manufacture's instructions.

Upon completion of a camping trip, and when storing a tent for a prolonged time, a camper should:

- shake out the tent to remove any dirt or debris from the inside of the tent;
- wash the tent with a sponge and water;
- dry thoroughly. If a wet tent is stored, the combination of room temperature heat, dirt, and water will lead to mould growth and break down the tent's material;
- store tent loosely in a oversized, breathable bag, allowing for any condensation that forms to evaporate easily;
- store tent poles fully assembled, reducing the stress on the elastic cords. If this is not possible, they should be folded in halves to provide equal stretch along the elastic cord and storing loosely in a large bag will further reduce the stress; and
- store away from sunlight in a cool, dark and dry location.

CONFIRMATION OF TEACHING POINT 4

The cadets shall be required to imitate, under supervision, the striking of a tent as a member of a group while the instructor provides feedback. The instructor should ensure additional instructors are on hand, should supervision of all tent groups prove difficult.

END OF LESSON CONFIRMATION

The confirmation of these skills will occur throughout the FTX, with the cadets first pitching and organizing a tent, and later striking and packing the tent away for storage.

CONCLUSION

HOMEWORK/READING/PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

A properly set up tent will ensure a comfortable, secure and stable shelter. A well organized tent space will also contribute to a pleasant overnight camping experience.

INSTRUCTOR NOTES/REMARKS

This lesson shall be delivered practically during the bivouac FTX. Setting up and striking of tent will occur as per FTX schedule (eg, arrival and prior to departure).

Time allocation is approximate, as it may vary based on the group.

REFERENCES

C2-009 (ISBN 0-684-85909-2) Harvey, M. (1999). *The National Outdoor Leadership School's Wilderness Guide.* New York, NY: Fireside.

ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 8

EO M121.08 – APPLY "LEAVE NO TRACE" CAMPING

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-701/PG-001, *Green Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

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

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to introduce the cadets to the concept of "Leave no Trace" camping.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to practice the principles of "Leave no Trace" camping during the conduct of a bivouac field training exercise (FTX).

IMPORTANCE

Expedition training is a large component of the Army Cadet Program. From corps training to the international expeditions, there are multiple opportunities to participate in expedition training. The knowledge presented in this lesson will enable the cadets to participate effectively, while respecting the environment and leaving it in its natural condition.

Teaching Point 1 **Explain the seven principles of "leave no trace" camping.**

Time: 25 min Method: Interactive Lecture

This lesson is to be delivered in the field, in two stages.

Stage 1. The instructor is required to cover the seven principles of "Leave no Trace" camping in the interactive lecture format within 15 minutes. A handout found at Annex A labelled The Principles of "Leave no Trace" Camping has been produced for the cadets' use.

Stage 2. At the end of Stage 1 the instructor will break cadets into seven small groups, assign a principle of no trace camping to each and have them develop a charade associated with the principle. Ten minutes have been allotted for this activity.

In some areas of the country results of overuse are very apparent. Trails are so deeply eroded in some places that the tree roots form a spider web structure a foot or more above the ground. Fire rings, garbage, and bare, lifeless patches of earth are common, but those are only the obvious signs of impact. There are many others that are less evident, such as water pollution, and the elimination of various plants and animals. These are some of the reasons why the no-trace camping ethic was adopted. The following seven principles are guidelines to follow when partaking in any outdoor adventure training activity.

PLANNING AHEAD AND PREPARING

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.** The environment is very diverse. 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 trip 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 will reduce the amount of garbage carried. Eliminating such trash reduces the possibility of accidentally leaving waste behind.

TRAVELLING AND CAMPING ON DURABLE SURFACES

Trampled vegetation and eroded trails last for years, or even a lifetime. Choose to set ones feet and tents on surfaces that endure (i.e., rock, sand, gravel, dry grasses, snow, or water). The following guidelines should be adhered to:

- **Concentrating Hike on Existing Trails and Campsites.** In popular areas, focus the hike 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.
- **Walking 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 Short Cuts Away From Established Trails.** Stay on trails. Short cutting around routes or obstacles may be time saving and rewarding; however, the effect on the vegetation and environment is damaging.

- **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.
- **Camping 100 Metres 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 60 metres 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. Deposit all human waste in cat holes dug 16 to 20 centimetres deep and at least 60 metres from water sources, camps, and trails. Cover and disguise the cat hole when finished. Be sure to follow any additional direction provided by the owner or manager of the area you are training in, and to 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 hike involves many participants. Be sure to employ a suitable disposal plan.

Washing Body or Dishes. Carry water 60 metres away from streams or lakes and use small amounts of biodegradable soap. Scatter strained dishwater.

LEAVE WHAT YOU FIND

While hiking 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.

- **Preserving the Past.** Cultural or historical structures and artefacts shall be left alone 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 anything is to be created out of necessity, once finished, return the environment to its original appearance.

MINIMIZING CAMPFIRE IMPACTS

The lasting impacts of 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, nothing 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 should respect the wildlife by observing some simple guidelines such as:

- observing wildlife from a distance;
- never feeding the animals;
- protecting wildlife and food by storing rations and trash securely;

- controlling pets; and
- avoiding wildlife during sensitive times (i.e., mating, nesting, when raising young, or during the winter).

BEING CONSIDERATE TO OTHER VISITORS

During hiking, one will likely encounter other travelers. Be sure to afford common courtesies and respect to others, 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, by avoiding loud voices and noises.

CONFIRMATION OF TEACHING POINT 1

ACTIVITY – CHARADES

Time: 10 min

OBJECTIVE

Recognize the seven principles of "Leave no Trace" camping.

RESOURCES

Nil.

ACTIVITY LAYOUT

- This activity will be a participative learning activity achieved through a small group charade. The cadets will be broken down into seven small groups and given a principle of "leave no trace" camping. The cadet groups will be expected to act out a principle while the other groups look on and guess what principle is being acted out. The following instructions detail specifically how to carry out this activity.
- Activity instructions:
    - divide cadets into seven small groups;
    - assign each group a principle of "Leave no Trace" camping;
    - give cadets 30 seconds to develop a silent charade no longer than one minute in length to present to the group;
    - in random order have cadet groups present their charade to the group;
    - if time is available, repeat charade only changing the principle each group has; and
    - the activity can be a challenge where the group with the most correct guesses wins.

Note:	This activity may also be conducted in the evening, giving the cadets more time to rehearse their charades and to then perform them.

SAFETY

Instructor will use personal judgement during the conduct of specific charades and intervene if it is determined that safety is being jeopardized. This is a supervised activity.

INSTRUCTOR GUIDELINES

Instructors are to continuously supervise and monitor the activity to ensure the material being presented is represented correctly.

END OF LESSON CONFIRMATION

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 hike what should one check to determine what clothing will be required for the trip?

ANTICIPATED ANSWERS

A1. (1) Plan ahead and prepare, (2) Travel and camp on durable surfaces, (3) Dispose of waste properly, (4) Leave what you find, (5) Minimize campfire impacts, (6) Respect wildlife, (7) Be considerate of other visitors.

A2. None, animals in the wild are not to be fed.

A3. Weather forecasts and the locations seasonal weather history.

CONCLUSION

HOMEWORK/READING/PRACTICE

Cadets should review the seven principle of “Leave no Trace” camping.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Expedition training is an important component of the Army Cadet Program. Knowing how to maintain our environment - giving it the respect it deserves - will be the challenge presented to cadets daily when participating in expeditions. The knowledge acquired here will enable the cadets to participate in such expeditions while leaving the environment in its natural condition.

INSTRUCTOR NOTES/REMARKS

This lesson shall be delivered during the bivouac FTX.

In some cases this lesson could be conducted as a tour of the local area, selecting areas where specific principles could be best explained.

REFERENCES

C2-011 (ISBN 0-89886-910-2) McGivney, A. (2003). *Leave No Trace, a Guide to the New Wilderness Etiquette.* Seattle, WA: Mountaineers Books.

HANDOUT – THE PRINCIPLES OF LEAVE NO TRACE CAMPING

<table>
<tr><th>Planning Ahead and Preparing</th><th>Travelling and Camping on Durable Surfaces</th></tr>
<tr><td>• Know the regulations and special concerns for the areas visited.
• Prepare for extreme weather, hazards and emergencies.
• Carefully plan meals and repackage food to minimize waste.</td><td>• Concentrate the hike on existing trails and campsites.
• Walk in single file in the middle of the trail, even when wet or muddy.
• Avoid taking short cuts off established trails.
• Travel on rock, gravel, dry grasses or snow.
• Camp 60 metres from lakes and streams.</td></tr>
<tr><th>Dispose of Waste Properly</th><th>Leave What You Find</th></tr>
<tr><td>• Pack it in, pack it out.
• Dispose of human waste.
• Pack out toilet paper and hygiene projects.
• Wash body or dishes.</td><td>• Preserve the past.
• Leave flora and fauna.
• Avoid the construction of structures.</td></tr>
<tr><th>Minimizing Campfire Impacts</th><th>Respect WildLife</th></tr>
<tr><td>• Build minimum impact fires by using an existing fire ring, pan or fire mound.
• Burn only dead and downed wood.
• 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 no evidence of a fire.</td><td>• 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 (i.e. mating, nesting, when raising young, or during the winter).</td></tr>
<tr><th colspan="2">Be Considerate to Other Visitors</th></tr>
<tr><td colspan="2">• Respect visitors to protect the quality of their experience.
• Yield to others on the trail.
• Camp away from trails and other visitors.
• Allow nature’s sounds to prevail. Avoid creating loud noises.</td></tr>
</table>

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ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 9

EO M121.09 – FOLLOW CAMP ROUTINE

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-701/PG-001, *Green Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

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

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

A practical activity was chosen for TP 1 as it is an interactive way to allow cadets to learn about bivouac site layout and components in a safe and controlled environment.

A demonstration and performance was chosen for TP 2 as is allows the instructor to demonstrate and explain hygiene in the field while providing an opportunity for the cadets to practice (during the FTX) the skill under supervision.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson the cadet shall be expected to follow camp routine, recognize the components of a bivouac site and carry out personal hygiene in the field.

IMPORTANCE

Cadets will be required to take part in numerous exercises. It is imperative they understand a bivouac's layout, and how maintaining hygiene is a task all cadets will be expected to perform.

Teaching Point 1 **Conduct a guided tour of a bivouac site describing the layout of each component.**

Time: 20 min Method: Practical Activity

COMPONENTS OF A BIVOUAC SITE

This teaching point is to be covered in the field following the set-up of the bivouac site in the form of an activity, detailed at the end of this teaching point.

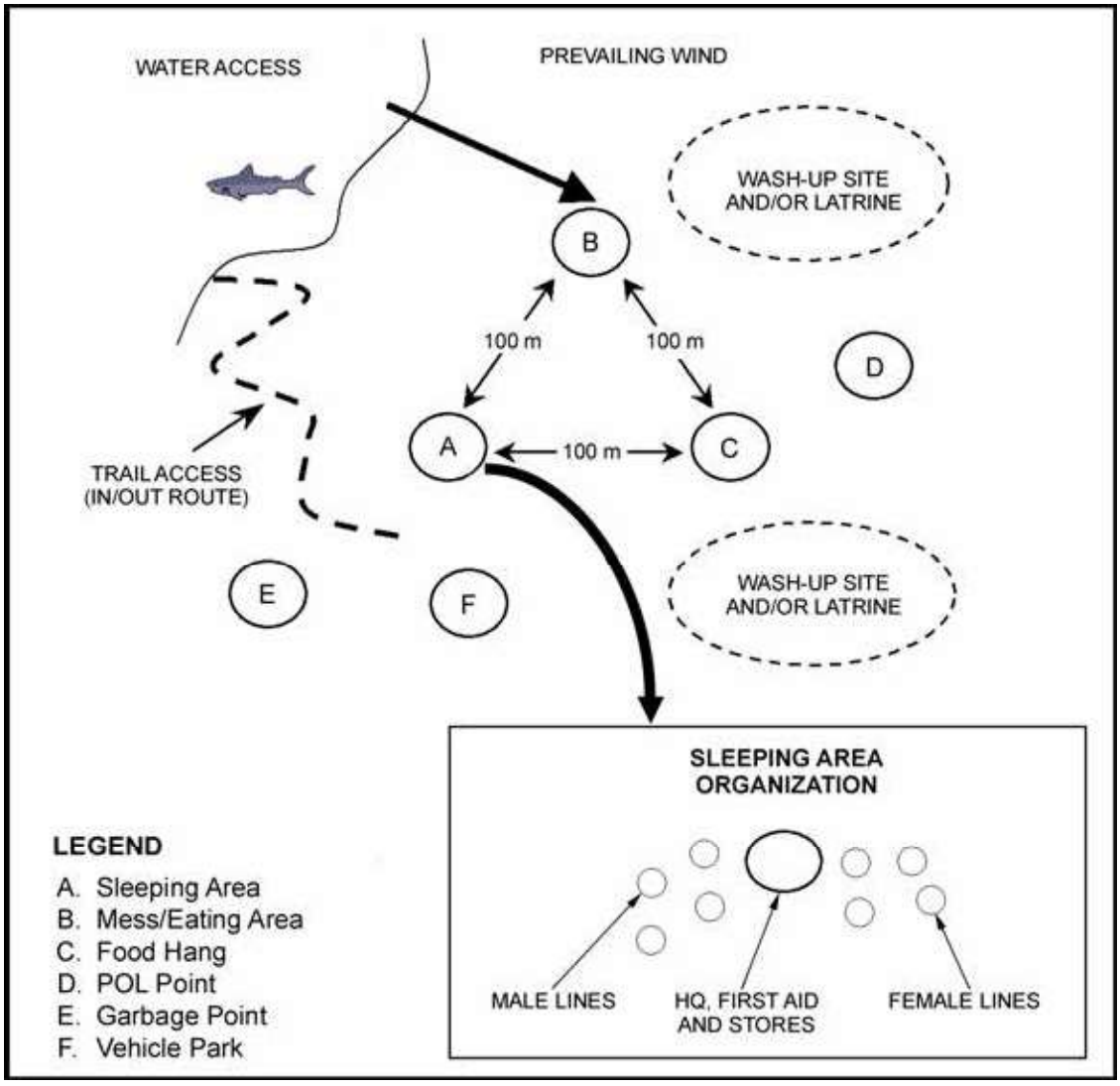
LAYOUT OF A BIVOUAC

Elements of the bivouac should include:

Element	Description
• Headquarters	• Location of OIC, communication centre.
• First aid station	• Central point containing first aid kit, stretcher etc.
• Supply	• Staffed by supply officer/company quartermaster sergeant. All stores not in use to be held here.
• Toilets	• Portable toilets or approved hand dug latrines.
• Wash station	• Established area for washing/ablutions. May have one for males and another for females.
• Mess/eating area	• Central point for all foods to be consumed. Assists in the control of waste and garbage, especially in areas with high animal activity.
• Fire pit	• A safe, vegetation free area to be used by group. Should be away from sleeping area, preventing incidents related to sparks/fire.
• Fire point	• A centrally located, accessible point housing the firefighting equipment.
• In/out route for safety vehicle	• Established routes to control vehicle traffic. This helps make the site safe from vehicle traffic, and prevents undue wear and tear on the environment.
• Vehicle parking area	• Clearly identified area for parking of exercise support vehicles. This area should be equipped with drip pans, to be placed under the engine of the vehicle.
• Drinking water point	• Location for storage/drawing of drinking water.
• Petroleum, Oils, Lubricants (POL) point	• Clearly marked storage area for fuels.

Element	Description
• Female/male quarters	• Sleeping areas.
• Garbage point	• Central point for collection/storage of garbage.

Once listed aspects of the bivouac site have been discussed, the cadets will tour the site with the instructor who will describe the layout of each component and explain why they are located where they are. A tie back to discuss “Leave no Trace” principles from EO M121.08 (Section 8) can also enhance this tour.



Army cadet reference hand book

Figure 1 Sample Bivouac Site

ACTIVITY

Time: 20 min

OBJECTIVE

Familiarize cadets with the components and layout of a bivouac site.

RESOURCES

Bivouac site components:

- Sleeping area.
- Mess/eating area.
- Food hang (If applicable).
- HQ, first aid and stores.
- Male lines.
- Female lines.
- POL point.
- Garbage point (animal-proof).

ACTIVITY LAYOUT

- This activity should take place after senior cadets have set up the bivouac site. The site components must be clearly labelled for the green star cadets.
- Prior to the tour the instructor shall take a moment and review with the cadets what they will see throughout the tour.
- In a fluid rotation, guide cadets through the bivouac site, giving explanations for each component of the site and its purpose.
- Twenty minutes are allotted for this guided tour. Be sure at the end of the tour to question cadets on the bivouac site components.

SAFETY

This is a supervised lesson. It is strongly recommended that additional staff accompany cadets throughout the tour.

INSTRUCTOR GUIDELINES

The instructor will be responsible to supervise the cadets, while explaining each component of the bivouac, during the guided tour. Attention should also be paid to opportunities to tie back to leave no trace principles from EO M121.08 (Section 8).

CONFIRMATION OF TEACHING POINT 1

The tour shall serve as the confirmation.

Teaching Point 2 **Explain, and demonstrate where practical, how to carry out personal hygiene in field.**

Time: 30 min Method: Demonstration and Performance

The following points are provided as background information for the instructor to use in the conduct of the activity for this teaching point.

HYGIENE

A high standard of personal hygiene is important in the field, as it protects against illness and promotes good health. Clothing and equipment, as well as the body, must stay clean and dry. Change clothes, especially socks and undergarments, regularly. Avoid soaps or shampoos with perfumes or strong odours; such scents will attract animals and insects. Good personal hygiene not only makes a person feel better, but peers will appreciate it too!

- **Washing.** Shall be conducted daily ideally using clean water or snow. Wash hands carefully with water and soap after dirty work, going to the washroom, and before cooking or eating. When water or privacy is restricted, wash at least the areas of the body that sweat the most: face, neck, feet, armpits and groin (Moist wipes are a quick and useful tool for cleaning the body in the field).
- **Hair.** Keep hair neat and wash with soap or shampoo at least once a week.
- **Teeth.** Brush teeth and use floss at least twice a day. Table salt or baking soda can be used as substitutes to toothpaste. If you do not have a toothbrush chewing a green twig to a pulpy consistency will work, as will rubbing the teeth with a piece of gauze. Rinse your mouth after each meal.
- **Feet.** Use foot powder on the feet, and body powder on the groin, to help avoid chafing in warm weather. Petroleum jelly will also help protect from chafing, especially in sensitive areas.
- **Regular Bowel Movements.** It is very important to go to the washroom regularly. Daily bowel movements will keep the system working properly. A change in activity and diet will often put extra stress on the digestive system, so maintain a healthy diet and drink plenty of fluids. Never try to “hold it” when it is necessary to go, especially at night, as a person will lose sleep and become uncomfortable.
- **Treating Injuries.** (Minor cuts, infections, and bruises). Even minor injuries are potentially serious if they become infected. Carefully treat every cut, sprain or bruise.
- **Shaving.** Where practical, cadets should shave daily. Because essential oils are stripped from the skin during shaving, in a cold climate, this is best performed prior to going to bed.

ACTIVITY

Time: 30 min

OBJECTIVE

Discuss and demonstrate to the cadets, the importance of hygiene in the field.

RESOURCES

Complete hygiene kit.

ACTIVITY LAYOUT

- For this activity the instructor will require a hygiene kit and, if possible, a hygiene station where all items inside the hygiene kit can be laid out and presented for all cadets to view.
- The goal will be to explain and demonstrate how to maintain personal hygiene in the field. Where practical, demonstrations could be examples or acts of the actual method.
- If time permits, have cadets brush their teeth and check their feet during the activity.

SAFETY

This is a supervised activity.

INSTRUCTOR GUIDELINES

The instructor will be responsible for the conduct of the cadets.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

Q1. How often should a person wash their hair when in the field?

Q2. What can substitute for toothpaste?

ANTICIPATED ANSWERS

A1. At least once a week.

A2. Salt or baking soda.

END OF LESSON CONFIRMATION

Confirmation of this lesson will take place during the activities and throughout the FTX, with the instructor providing advice and making corrections as necessary.

CONCLUSION

HOMEWORK/READING/PRACTICE

Cadets are required to maintain good personal hygiene while on an FTX, and should ensure that proper hygiene is carried out prior to going to bed each night.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Outdoor activities are an important component of the Army Cadet Program. For many cadets the outdoors are an environment that is foreign to them, and their bodies may not be accustomed to dealing with the various natural contaminants found in the outdoors. One way for cadets to protect themselves from injuries and sickness is to maintain a proper daily hygiene routine. Maintaining proper hygiene will not only make the individual cadet feel better, it will make their entire group happier.

INSTRUCTOR NOTES/REMARKS

This lesson shall be delivered during the bivouac FTX.

REFERENCES

C2-004 (ISBN 1-896713-00-9) Tawrell, P. (1996). *Camping and Wilderness Survival: The Ultimate Outdoors Book.* Green Valley, ON: Paul Tawrell.

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ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 10

EO C121.01 – CONSTRUCT FIELD AMENITIES

Total Time: 120 min

PREPARATION

PRE-LESSON INSTRUCTIONS

Resources needed for the delivery of this lesson are listed in the lesson specification located in A-CR-CCP-701/PG-001, *Green Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

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

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

A demonstration and performance was chosen for TP 1 as is allows the instructor to demonstrate and explain how to tie knots while providing an opportunity for the cadets to practice the skill under supervision.

A practical activity was chosen for TP 2 as it is an interactive way to allow cadets to experience creating field amenitues in a safe and controlled environment.

INTRODUCTION

REVIEW

The pertinent review for this lesson will include tying of a:

- reef knot EO M121.03 (Section 3); and
- clove hitch EO M121.03 (Section 3).

OBJECTIVES

By the end of this lesson the cadets shall be expected to construct field amenities utilizing the knots and lashings presented.

IMPORTANCE

Field amenities serve many purposes at the bivouac site, from storing food to drying wood. The construction of such objects makes field living more comfortable.

Teaching Point 1 **Explain, demonstrate and have the cadets tie knots and lashings used in the construction of field amenities.**

Time: 50 min Method: Demonstration and Performance

KNOTS

Constrictor Knot. With one extra tuck, the clove hitch becomes the constrictor knot and can be tightened around any object. Made with fine twine, it serves as an improvised whipping at the end of a rope. It can also act as a hose clip, or a round clamp when trying to glue a split in a piece of wood. The knot can be pulled extremely tight if it is tied around something like a screwdriver. It may need to be cut loose with a knife as the knot is so tight.

The instructor shall provide an EXPLANATION and DEMONSTRATION of the complete process.

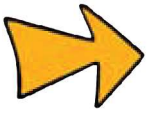
The instructor shall then provide an EXPLANATION and DEMONSTRATION of each step required to effectively tie the knot.

The Pocket Guide to Knots and Splices, Des Pawson, 2001

Figure 1 The Constrictor Knot

To tie a constrictor knot:

1. begin with a clove hitch;
2. bring the working end tuck over and under the standing part, making the first half of a reef knot; and
3. pull tight so that the half knot is trapped under the crossing of the clove hitch to finish the knot.

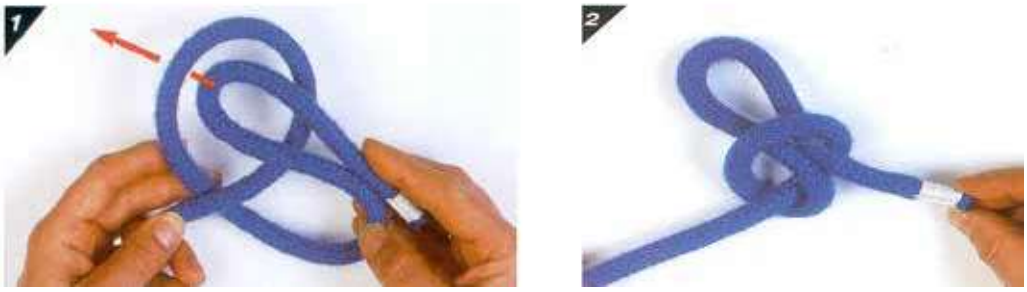


Cadets will IMITATE the demonstration provided by the instructor for each step within the process. The instructor(s) will SUPERVISE the cadets during this imitation.

Slipped Overhand Knot. Like the overhand knot EO M121.03 (Section 3), this knot serves as a stopper knot, holding objects when the tension is equal at both ends, etc. The addition of a slip allows for quick release. The bight or loop remaining allows the knot to be untied, or “slipped,” by pulling the short end protruding from the knot.

The instructor shall provide an EXPLANATION and DEMONSTRATION of the complete process.

The instructor shall then provide an EXPLANATION and DEMONSTRATION of each step required to effectively tie the knot.



The Pocket Guide to Knots and Splices, Des Pawson, 2001

Figure 2 Slipped Overhand Knot

To tie a slipped overhand knot:

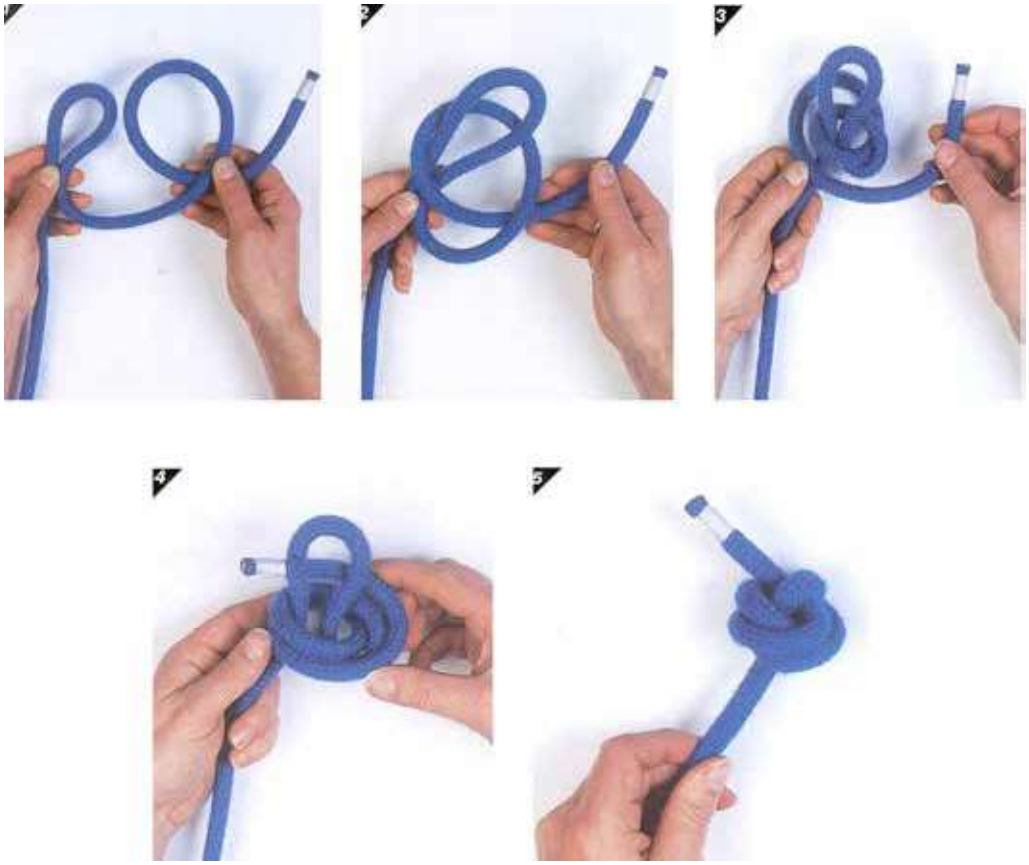
- form a bight in the working part of the rope and tuck as in the overhand knot; and
- tighten the knot.

Cadets will IMITATE the demonstration provided by the instructor for each step within the process. The instructor(s) will SUPERVISE the cadets during this imitation.

Sink Stopper Knot. When a large knot is needed, it is tied at the end of a rope, and usually prevents a rope from being pulled through a hole. It also stops the end of a rope from fraying.

The instructor shall provide an EXPLANATION and DEMONSTRATION of the complete process.

The instructor shall then provide an EXPLANATION and DEMONSTRATION of each step required to effectively tie the knot.



The Pocket Guide to Knots and Splices, Des Pawson, 2001

Figure 3 Sink Stopper Knot

To tie a sink stopper knot:

1. make a crossing turn with the working end passing under the standing part of the rope. Make a bight in the standing part;
2. tuck the bight formed in the standing part up through the loop;
3. tighten a little and take the working part in a counterclockwise direction around the standing part;
4. tuck the working end through the bight, ensuring that the working part fits snugly into the crossing part of the original overhand knot. Work all the slack out to form a neat tight knot; and
5. the knot is finished.

Cadets will IMITATE the demonstration provided by the instructor for each step within the process. The instructor(s) will SUPERVISE the cadets during this imitation.

BENDS

Sheet Bend. One of the simplest and best ways to tie two pieces of rope together. It works best if the ropes are the same or almost the same size.

The instructor shall provide an EXPLANATION and DEMONSTRATION of the complete process.

The instructor shall then provide an EXPLANATION and DEMONSTRATION of each step required to effectively complete the bend.

The Pocket Guide to Knots and Splices, Des Pawson, 2001

Figure 4 Sheet Bend

To tie a sheet bend:

1. fold the end of a piece of rope back on itself to form a bight. If the ropes to be joined are of varying sizes, this should be the larger of the two. Bring the working end of the second piece of rope up through the bight;
2. take the working end of the rope round the shorter end of the first rope and round behind the standing part; and
3. the working end of the second piece is tucked under itself, then pulled tight.

Cadets will IMITATE the demonstration provided by the instructor for each step within the skill. The instructor(s) will SUPERVISE the cadets during this imitation.

Double Sheet Bend. Much like the sheet bend, it is best used if there is a great difference in the size of the two ropes to be joined. It is made with the thinner of the two, and the extra turn in the double sheet bend makes a lot of difference by stopping any slipping, or the knot from collapsing.

The instructor shall provide an EXPLANATION and DEMONSTRATION of the complete process.

The instructor shall then provide an EXPLANATION and DEMONSTRATION of each step required to effectively complete the bend.

The Pocket Guide to Knots and Splices, Des Pawson, 2001

Figure 5 Double Sheet Bend

To tie a double sheet bend:

1. make the sheet bend, then carry on and make a second pass right round the bight with the working end of the second piece of rope; and
2. pull the finished knot tight.

Cadets will IMITATE the demonstration provided by the instructor for each step within the process. The instructor(s) will SUPERVISE the cadets during this imitation.

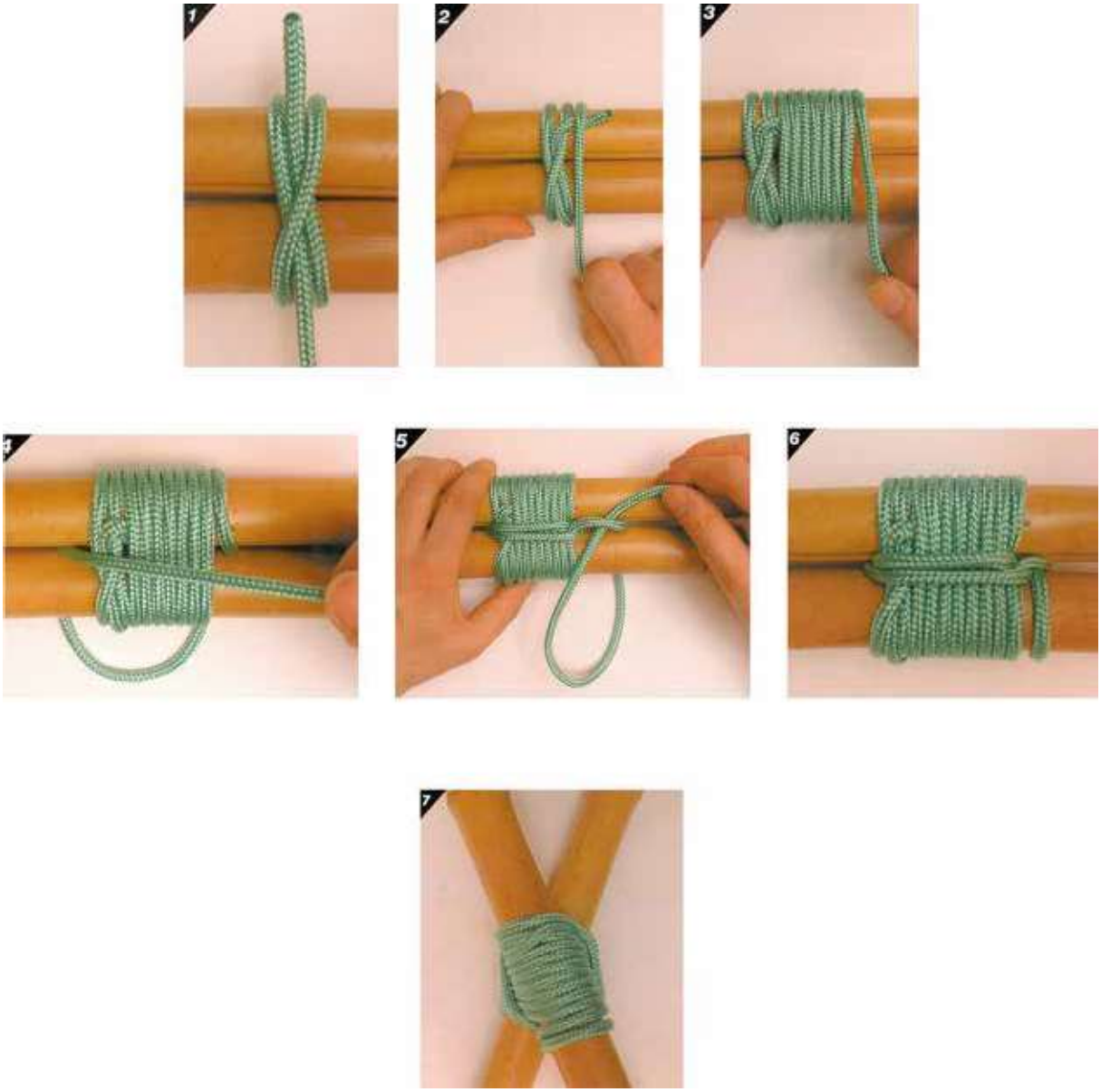
LASHING

Sheer Lashing. Has two distinct uses:

- creates an “A” frame or set of sheer legs using one sheer lashing; and
- multiple lashings can be used to bind together a couple of poles to make a larger arm or rod.

The instructor shall provide an EXPLANATION and DEMONSTRATION of the complete process.

The instructor shall then provide an EXPLANATION and DEMONSTRATION of each step required to effectively complete the lashing.



The Pocket Guide to Knots and Splices, Des Pawson, 2001

Figure 6 Sheer Lashing

To tie a sheer lashing:

1. start by making a clove hitch around both poles;
2. wrap round both poles, trapping the end of the clove hitch;
3. carry on making eight to ten more turns round the pair of poles. The lashing could now be finished with a clove hitch round both poles; or
4. add a couple of trapping turns by bringing the end of the rope between the two poles;
5. finish off with a clove hitch around one of the poles;

6. pull the running end tight and tuck the loose end through the parallel poles of the finished sheer lashing; and
7. open the finished sheer lashing to create a pair of sheer legs or “A” frame.

Cadets will IMITATE the demonstration provided by the instructor for each step within the skill. The instructor(s) will SUPERVISE the cadets during this imitation.

CONFIRMATION OF TEACHING POINT 1

Cadets will PRACTICE the tying each knot, bend and hitch. The instructor(s) will SUPERVISE the cadets during this practice and provide feedback as required.

QUESTIONS

Q1. What is a sink stopper knot used for?

Q2. Can a bend tie two pieces of unequal sized rope together?

Q3. What is one of the uses of a sheer lashing?

ANTICIPATED ANSWERS

A1. To prevent a rope from being pulled through a hole, or from fraying at the end.

A2. Yes, it can.

A3. One of the following: creates an “A” frame, or a set of legs using one sheer lashing, or multiple lashings can be used to bind together a couple of poles to make a larger arm or rod.

Teaching Point 2 **Have the cadets create two field amenities.**

Time: 60 min Method: Practical Activity

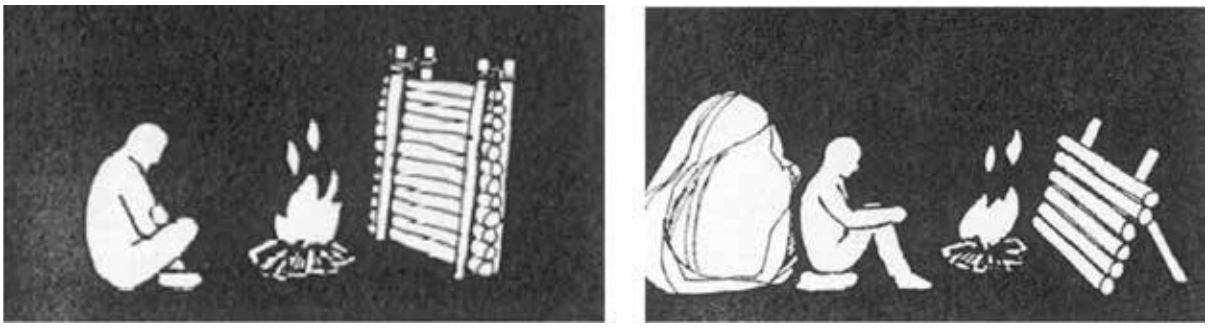
FIELD AMENITIES

Bear Hang. A bear hang allows the resident of a base camp to store food, while preventing a bear or animal from getting to it.

The Backpacker’s Field Manual: A Comprehensive Guide to Mastering Back Country Skills, Rick Curtis, 1998

Figure 7 Bear Hang

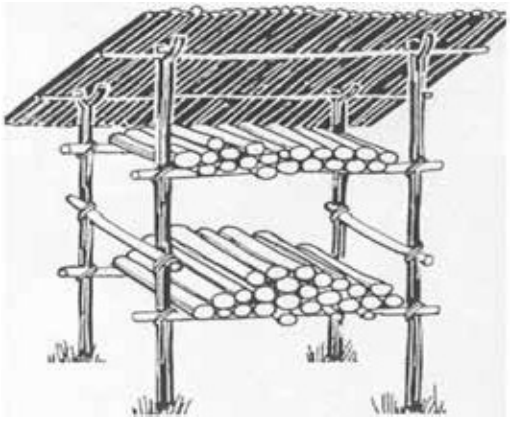
Fire Wall Reflector. A fire wall reflector will help shield a fire from wind which can blow it out, and spread the fire and sparks around the bivouac site. It also reflects the heat around the bivouac site. The wall will vary, depending on how high you will need it.



The SAS Survival Handbook, John Wiseman, 1986

Figure 8 Fire Wall Reflector

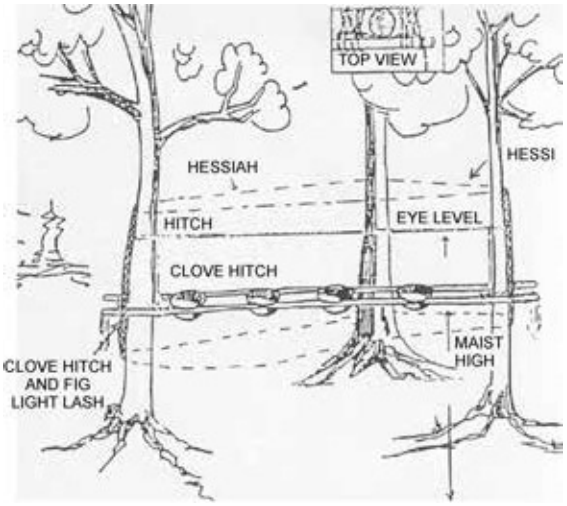
Drying Rack. A drying rack should be set up close enough to a fire to dry the wood, but not so close to ignite if struck by a spark. The two levels of the rack allow for adding more wet wood and still keeping them separate from the already drying wood.



The SAS Survival Handbook, John Wiseman, 1999

Figure 9 Drying rack

Wash Station (Ablutions). Wash stations may be constructed in a structure similar to one found in Figure 10. The dotted line indicates that you may attach cloth to add privacy.



Field Aide-Memoire, Regional Cadet Instructor School, 1999

Figure 10 Ablutions Stand

ACTIVITY

OBJECTIVE

Cadets will construct suggested field amenities for a bivouac site using the knots and lashings learned to date.

RESOURCES

Cadets will be given:

- Adequate supply of rope.
- Natural resources, procured in the field, suitable for construction of field amenities.
- Diagrams of suggested construction for field amenities, found at Attachment A.
- Supervision.
- Minimal assistance as required.

ACTIVITY LAYOUT

- Cadets will be divided into groups of four and given a diagram of a field amenity introduced in this lesson. They will be given the resources listed above and a time limit of 100 minutes for preparation and construction of field amenities.

The cadets are to select and utilize the most appropriate of the knots and lashings presented in EO M121.03 (Section 3) and this EO to construct the field amenities.

SAFETY

Cadets will adhere to the following safety rules in the field:

- safe tools use;
- no running or horseplay;

- utilizing the buddy system at all times; and
- respecting established boundaries.

INSTRUCTOR GUIDELINES

While cadets construct field amenities, the instructor will monitor the groups and ensure the safety of cadets.

Cadets are reminded to adhere to the rules of no trace camping by utilizing felled wood and returning their environment to the way it was found. Field amenities may be constructed using logs, dead wood, etc.; however, these materials must be redistributed once the activity is completed.

END OF LESSON CONFIRMATION

The end of lesson confirmation will be accomplished through judging of the field amenities constructed. They will be judged for stability, quality of knots, and overall appearance.

CONCLUSION

HOMEWORK/READING/PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

After learning how to enhance your base camp, you will be better prepared to enjoy your living space in the field. Field amenities can help the field feel like your home away from home.

INSTRUCTOR NOTES/REMARKS

Approval from local authorities shall be obtained prior to using natural resources for field amenities.

REFERENCES

A2-008 DCdts (1999). *RCIS Field Aide-Memoire* (1 ed.). Ottawa, ON: National Defence.

C2-007 (ISBN 0-7858-1446-9) Pawson, D. (2001). *Pocket Guide to Knots and Splices.* Edison, NJ: Chartwell Books, Inc.

C2-008 (ISBN 0-00-265314-7) Wiseman, J. (1999). *The SAS Survival Handbook.* Hammersmith, London: Harper Collins Publishers.

C2-016 (ISBN 0-517-88783-5) Curtis, R. (1998). *The Backpacker's Field Manual: A Comprehensive Guide to Mastering Backcountry Skills.* New York, NY: Three Rivers Press.

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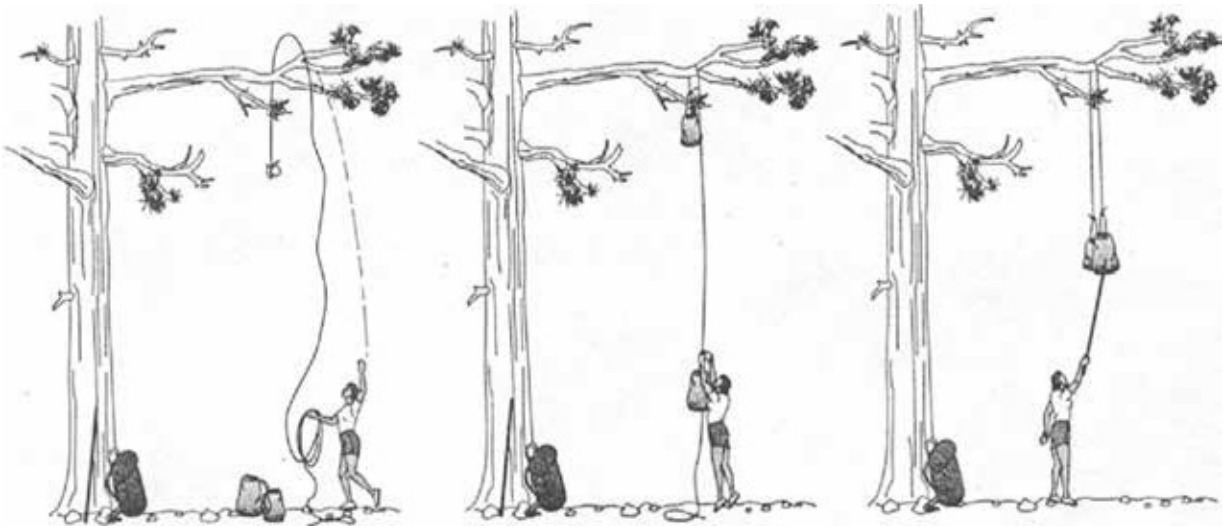
CONSTRUCT FIELD AMENITIES

BEAR HANG



Instructions:

1. Find a tree with a live branch. The branch should be at least 15 feet (five metres) from the ground with no object below that a bear could stand on. When you throw the rope it should be more than 10 feet (three metres) from the tree.
2. Separate food from other items and store them into two equal bags.
3. Throw the rope over the branch. Attach one end of the rope to one of the bags with a slipped overhand knot.
4. Raise the bag as close as you can to the branch.
5. Attach the other bag to the rope as high up on the rope as you can. Leave a loop of rope near the bag for retrieval.
6. Push the second bag up to the level of the other bag with a long stick.
7. To retrieve the bags, hook the loop of the rope with the stick and pull it down. Remove the bag and then lower the first bag.

Safety:

- Make sure that no one is standing near when you are throwing or retrieving the bags.
- Do not place objects heavier than two pounds in each bag.
- Remember to distribute the weight of the two bags as best as you can.

Standard:

A proper bear hang should meet specifications above as close as possible. The instructor should be satisfied that the bag would be inaccessible to a bear. All knots and lashings will be assessed for neatness, proper appearance, and proper use for the knot.

FIRE WALL REFLECTOR

Instructions:

1. Cadets should find an area suitable for insulating heat, such as a rock in the diagram below.
2. If unable, there should be two walls to reflect the heat onto the people using it.
3. Attach two poles using a clove hitch, with about four to six inches in between to fill with smaller logs and wood found in the area.
4. As in the second diagram, the reflector wall may be on a slant and the logs lashed to the support beams also with a clove hitch.

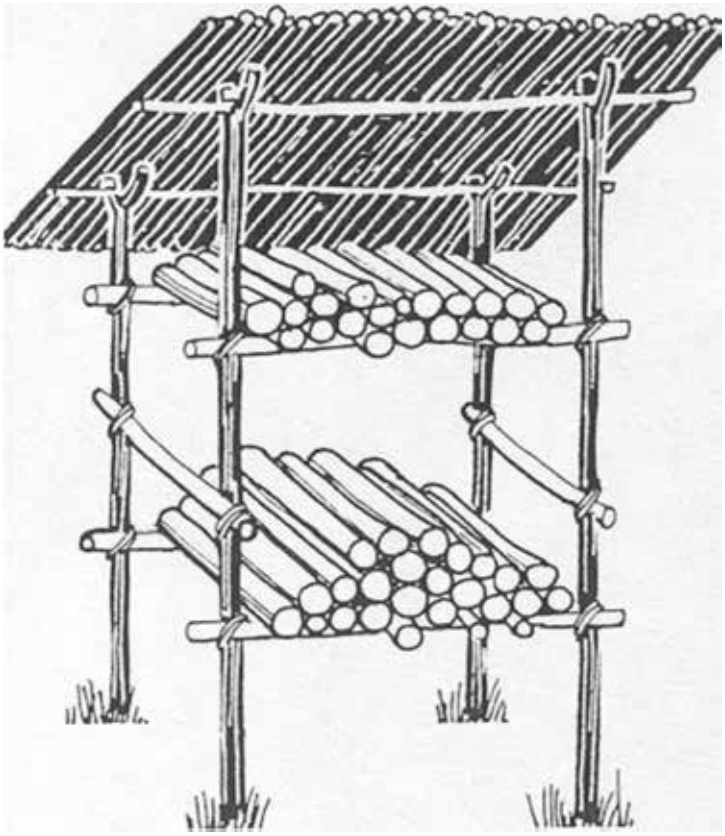
Safety:

1. Cadets should be cautious moving through the woods, gathering materials to fill the walls. Make sure to utilize the buddy system.
2. Only use logs that you are physically able to carry.
3. Do not build anything high enough to fall on you if it topples.

Standard:

The reflector should be able to stand on its own without falling over, and must be built in a strategic place to reflect heat. All knots and lashings will be assessed for neatness, proper appearance, and proper use for the knot.

DRYING RACK



Instructions:

1. Find four sticks that have a branch close to the top so that it looks like a letter ‘Y.”
2. Two of the sticks shall be shortened six inches. A bar will be placed between each set of sticks to hold a roof.
3. Use a half shelter or lash sticks of similar size, length, and thickness together to act as a roof for the wood shed. The roof will need to be as wide or wider than the base structure.
4. Lash a stick to each side of the structure and lay wood across to dry.
5. Add more sticks on the sides of the structure to add support or another shelf for wood.

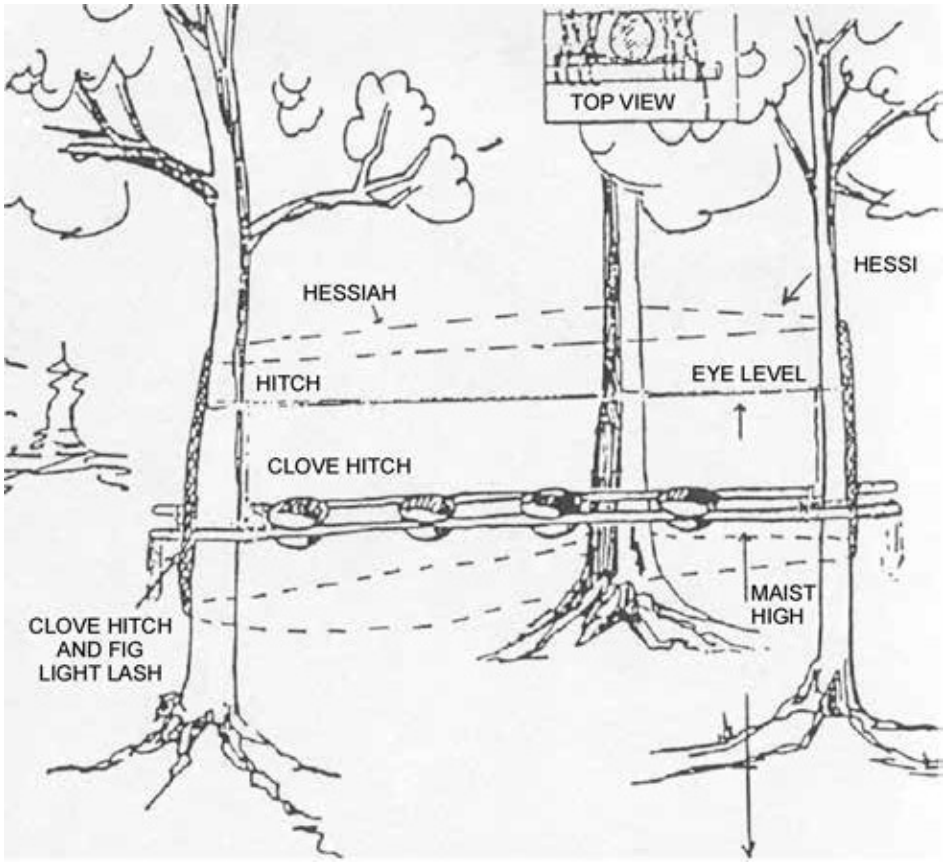
Safety:

Place the roof on first before trying to raise the structure so it is less likely to fall and hurt anyone.

Standard:

The structure should be free standing, and able to hold wood on one or two levels, depending on the sophistication of the structure. All knots and lashings will be assessed for neatness, proper appearance, and proper use for the knot.

ABLUTIONS STAND



Instructions:

1. Locate three trees approximately eight to ten feet apart in a triangular formation. If a third tree is not available, improvise with a picket (a tall, sturdy stick to be used as a post).
2. Locate two sticks long enough to extend slightly past two of the three trees. These sticks will need to support four wash basins.
3. Lash one stick on each side of the trees at waist height using a clove hitch.
4. Construct four wash basin holsters by tying figure eight weaves in pairs. The lashings should be close enough to slide a wash basin in between.

Note:	Ground sheets may be lashed to the outside of the tree formation to provide privacy for someone using the ablution stand.

Safety:

1. Make sure than you only use logs that you are able to lift safely.
2. Logs should be braced at both ends while being tied and lashed to trees.

Standard:

The wash area should be able to support wash basins, and at a level that is reachable by everyone. All knots and lashings will be assessed for neatness, proper appearance, and proper use for the knot.

ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 11

EO C121.02 – EXPLAIN THE EFFECTS OF COLD CLIMATE EXPOSURE

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-701/PG-001, *Green Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

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

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen to introduce the cadets to the effects of cold weather climate.

INTRODUCTION

REVIEW

Nil.

OBJECTIVES

By the end of this lesson, the cadets shall be expected to prepare themselves to participate in a cold weather Field Training Exercise (FTX).

IMPORTANCE

Training in cold climates provides unique challenges to ensure cadets are safe and healthy. The risk of exposure is greatly increased when individuals are unaware of the various risk factors. For that reason, every cadet should be familiar with cold weather risk factors prior to participating in cold weather training.

Teaching Point 1 **Identify types of cold.**

Time: 5 min Method: Interactive Lecture

TYPES OF COLD

- **Wet Cold.** Wet cold conditions occur when the temperature is close to the freezing point, with daytime temperature varying between freezing and thawing. Clothes need to be water resistant and wind repellent on the outer layer, and insulating and warm on the insulating layer. Waterproofing is essential.
- **Dry Cold.** Dry cold conditions occur when the temperature is below -10°C, when the ground is usually frozen and the snow is dry. This type of cold is identified by a crunching sound when walking in the snow. Wind and cold temperatures mean that protection of the whole body is needed. Clothing needs to provide adequate insulation for the body, bringing the dead air surrounding the body to 18.3°C. This insulation layer must be covered by an outer layer which is water and wind repellent.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

Q1. At what temperatures do wet cold conditions occur?

Q2. What are some of the dry cold conditions?

Q3. At what temperatures do dry cold conditions occur?

ANTICIPATED ANSWERS

A1. Wet cold conditions occur when the temperature is above -10°C.

A2. Dry cold conditions include frozen ground and dry snow.

A3. Dry cold conditions occur when the temperature is below -10°C.

Teaching Point 2 **Explain windchill effect on the human body.**

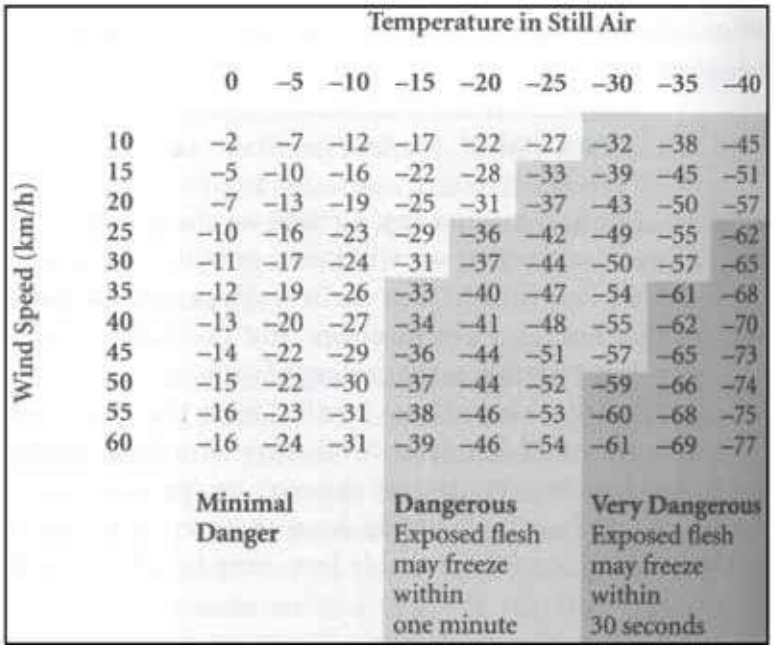
Time: 10 min Method: Interactive Lecture

WIND CHILL AND ITS RELATED EFFECTS ON THE HUMAN BODY

Wind chill is defined as the number of calories lost during one hour from a square metre of a surface kept at neutral skin temperature (33°C). Wind chill is a measure of the combined effects of wind and temperature (See Figure 1).

Human comfort depends on the maintenance of a constant body temperature. When high winds are blowing, it feels much colder than when it is calm.

The lesson to remember is that thermometer readings alone will not give you a valid indication of the effects to be expected on the body. The wind chill scale is not strictly applicable as a measure of human comfort, as it does not take into account important factors such as activity, humidity, loss of heat in breath, radiation from the sun and the effects of lowered skin temperature.



Wind Speed (km/h)	Temperature in Still Air								
	0	−5	−10	−15	−20	−25	−30	−35	−40
10	−2	−7	−12	−17	−22	−27	−32	−38	−45
15	−5	−10	−16	−22	−28	−33	−39	−45	−51
20	−7	−13	−19	−25	−31	−37	−43	−50	−57
25	−10	−16	−23	−29	−36	−42	−49	−55	−62
30	−11	−17	−24	−31	−37	−44	−50	−57	−65
35	−12	−19	−26	−33	−40	−47	−54	−61	−68
40	−13	−20	−27	−34	−41	−48	−55	−62	−70
45	−14	−22	−29	−36	−44	−51	−57	−65	−73
50	−15	−22	−30	−37	−44	−52	−59	−66	−74
55	−16	−23	−31	−38	−46	−53	−60	−68	−75
60	−16	−24	−31	−39	−46	−54	−61	−69	−77
	Minimal Danger			Dangerous Exposed flesh may freeze within one minute			Very Dangerous Exposed flesh may freeze within 30 seconds		

St. John Ambulance Official Wilderness First-Aid Guide, Wayne Merry, 1994

Figure 1 Wind Chill Chart

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

Q1. Wind chill is defined as the number of what lost, during one hour, from a square metre of a surface kept at neutral skin temperature?

Q2. True or false? When high wind is blowing, the temperature can feel colder than it is.

Q3. What are other factors that need to be taken into account with the wind chill?

ANTICIPATED ANSWERS

A1. Number of calories.

A2. True.

A3. Factors include activity, humidity, loss of heat from breath no comma and radiation from the sun.

Teaching Point 3 **Discuss the rules of cold weather training.**

Time: 10 min Method: Interactive Lecture

BASIC RULES OF COLD WEATHER TRAINING THAT ALLOW THE BODY TO ADJUST TO COLD CONDITIONS

The human body must be protected. To remain functional, it must be kept clean, dry and reasonably warm with normal body processes maintained. Rest and nutrition are vital.

Here are four basic rules to remember:

- **Keep in Shape.** Cold weather clothing is very heavy and can make you very tired when moving around in it. If you stay in shape, you will not become exhausted so quickly. A sleeping cadet will not freeze unless exhausted. You will awaken long before the danger point approaches.
- **Proper Hydration.** In winter, people generally do not drink enough water, as it is harder to come by. Dehydration leads to fatigue, so it is important to drink water even though you may not feel thirsty. This rules goes hand-in-hand with keeping active. As you do more activities to stay in shape, you have to replenish fluids lost through sweating. It is also important to mention that the wearing of heavy clothes leads to sweating which is not always noticeable to you. This sweating will lead to dehydration if not properly addressed.
- **Eating to Keep Fit.** Regular, hot food is essential to feeling your best and for top performance. Make sure you are eating, even if you do not feel hungry. It is important to eat three meals a day of as much hot food as you can. Healthy snacks, such as trail mix, between meals and before going to sleep will help generate body heat as the food is metabolized.
- **Maintain a Healthy Attitude.** Having a healthy attitude will help you survive longer in the cold. Keep alert and cheerful, and work hard. This combination will give you the right attitude. Training in cold weather can be difficult and uncomfortable, which can affect morale and mood. Having some patience, an open mind and some determination can allow you to enjoy many of the activities that the cold weather brings.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS

Q1. What are two of the basic rules for cold weather training that help the body adjust to the cold?

Q2. Does severe exhaustion increase or decrease the chance of fatality in the cold?

Q3. Should you drink water if you do not feel thirsty?

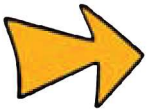
ANTICIPATED ANSWERS

A1. Any two of the following:

- keep in shape;
- proper hydration;
- eat to keep fit; and
- maintain a healthy attitude.

A2. Increases.

A3. Yes, you should drink water, even if you do not feel thirsty.



Remember – Cold weather will make tasks harder and they may take longer, but it does not make them impossible. With the right equipment and training, you can beat the cold.

END OF LESSON CONFIRMATION

Confirmation is best achieved by going outside and reviewing the conditions; however, if the weather is not appropriate, the end of lesson confirmation could be any of the following questions:

QUESTIONS

Q1. At what temperature do wet cold conditions occur?

Q2. What are some of the characteristics of dry cold conditions?

Q3. Wind chill is defined as the number of what lost during one hour from a square metre of a surface kept at neutral skin temperature?

Q4. True or false? When high wind is blowing, it can feel colder than it is.

Q5. Should you drink water if you do not feel thirsty?

ANTICIPATED ANSWERS

A1. Wet cold conditions occur when the temperature is above 14°F.

A2. Cold conditions include frozen ground and dry snow.

A3. Number of calories.

A4. True.

A5. Yes.

The instructor may choose to write down each of the questions on a piece of paper and place them into a bag. The cadets can then be divided into pairs (if the group is large), and each individual (or group) then picks a piece of paper out of the bag. The cadet should read the question and provide the answer to the rest of the group.

CONCLUSION

HOMEWORK/READING/PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Remember: You can coexist with the cold ***if*** you are prepared and take care of yourself by following the basic rules of training in cold weather.

INSTRUCTOR NOTES/REMARKS

This period may be conducted as a stand alone lesson or as pre-training to EO C121.05 (Participate in Cold Weather Training).

This lesson is best delivered under the supervision of a cold weather instructor.

REFERENCES

A2-009 A-CR-CCP-107/PT 002 DCdts. (1978). *Royal Canadian Army Cadets Course Training Plan Corps Training Program Winter Adventure Training Manual.* Ottawa, ON: National Defence.

C2-029 The Green Lane. (2002, 2005). *Windchill.* Retrieved 25 May 2006, from http://www.msc.ec.gc.ca/windchill.

ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 12

EO C121.03 – SELECT COLD WEATHER CLOTHING

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-701/PG-001, *Green Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

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

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to introduce the cadets to the selection of cold weather clothing.

INTRODUCTION

REVIEW

The pertinent review of EO M121.01 (Section 1) for this lesson will include:

QUESTIONS

Q1. What are the three layers that make up the layering system?

Q2. What is a good material to use for base layer clothing?

ANTICIPATED ANSWERS

A1. Base layer, insulating layer, outer layer.

A2. Polypropylene.

OBJECTIVES

By the end of this lesson, the cadet shall be expected to know how to select clothing for cold weather.

IMPORTANCE

Cadets need to know how to select the best types of clothing that will enable them to enjoy winter conditions and prevent cold weather injuries.

Teaching Point 1 **Explain the principles of clothing design.**

Time: 10 min Method: Interactive Lecture

PRINCIPLES OF CLOTHING DESIGN

The human body must always maintain a temperature of 37°C. Clothing acts as an insulator, preventing body heat from escaping to the outside air.

Cold weather clothing must provide insulation and, at the same time, ventilation to prevent overheating and allow sweat to evaporate. The two primary considerations when dressing for the cold are; insulation and layer method.

- **Insulation.** Insulation is provided by any material that restricts the transfer of heat. Dry air is both light and an excellent insulator. Materials that hold quantities of motionless, or dead air are the best insulators. These include natural materials such as wool and fur and synthetic materials such as the popular polar fleece.
- **Layer Method.** The principles of the layer method of insulating the body for a cold climate include:
    - The next to skin layer should be of a suitable material to wick perspiration away from the skin and allow it to evaporate.
    - Several layers of medium weight clothing will keep a person warmer than one heavy garment, even if it is as thick as the combined layers. Layers trap dead air, therefore resisting the passage of heat out of the body.
    - Inner garments should be more porous, therefore having more air pockets, while the outer layers are more wind and water resistant. The outer garments prevent the outside cold air from displacing your trapped, body-warmed, still air.
    - Layering allows you to adjust the amount of clothing being worn for a wide range of temperatures and activities by merely adding or removing a layer of clothing at a time. You have the ability to help control the balance of body heat.
    - The outer layer must allow moisture from perspiration to escape while retaining warmth. In a dry cold this material does not need to be water resistant but must be wind resistant.
    - When properly dressed you should feel cool, but not cold.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

Q1. What are two examples of insulating materials?

Q2. Which is warmer, several medium weight layers, or one thick layer of clothing?

Q3. Outer layers should be resistant to what?

ANTICIPATED ANSWERS

A1. Wool and fur.

A2. Several medium layers of clothing.

A3. Wind and water.

Teaching Point 2 **Explain the principles related to the choice of footwear.**

Time: 5 min Method: Interactive Lecture

PRINCIPLES VALUABLE IN CHOICE AND USE OF FOOTWEAR

Feet are vulnerable to the cold because they get wet easily, both externally and from perspiration.

The following principles are valuable when choosing and wearing footwear:

- **Ensure Footwear is Loose and in Layers.** The layers are made up by the boot and the different combinations of socks and insoles.
- **Avoid Restriction of Circulation.** Two or more pairs of socks worn too tightly or tying the boot too tightly can restrict the circulation of warm blood from the body core and allow for freezing of the feet.
- **Change Socks and Insoles as Often as Possible.** Since footwear often gets wetter than other types of equipment, select footwear designed to help decrease this (e.g. with a rubber lower and material upper). Dry socks should always be carried, and socks should be changed as soon as possible when they become wet. If wearing heavy footwear equipped with removable insoles, such as mukluks, both socks and insoles should be changed.
- **Dry Footwear When Wet.** Footwear should be dried thoroughly at the first opportunity available to you.
- **Ensure Footgear and Feet are Kept Clean.** Footgear should be kept clean of mud and dirt, and feet should be cleaned frequently. Feet should always be exercised and massaged when changing socks.
- **Ensure All Footwear Fits Properly to Avoid Chafing and Blisters.** Ski and snowshoe bindings must be adjusted carefully. Improperly adjusted bindings may chafe the feet or cause excess wear and tear to the boot.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

Q1. What are considered to be layers in footwear?

Q2. How often should you change socks?

Q3. What happens when two pairs of socks are worn too tightly?

ANTICIPATED ANSWERS

A1. Boots, socks and insoles.

A2. As often as possible, and as soon as they become wet.

A3. They can restrict circulation and cause feet to freeze.

Teaching Point 3 **Explain the principles for keeping warm in the cold.**

Time: 5 min Method: Interactive Lecture

PRINCIPLES FOR KEEPING WARM IN THE COLD

Principles for keeping warm in the cold can be remembered using the acronym COLD:

C – Clean Clothing. Important for both sanitation and comfort. Dirt and grease will fill air pockets in clothes and allow the heat to escape your body more easily, leaving you feeling cold sooner.

O – Overheating must be avoided. Overheating causes perspiration, which causes clothing to become damp. Dampness fills the air pockets in the clothing with heat-conducting moisture, permitting the body heat to escape. Overheating can be prevented by ventilation or removing layers.

L – Loose and in **Layers.** Clothes and footwear that are too tight restrict the blood circulation, increasing the danger of frostbite. Clothes should not be too loose either, as this allows trapped air to move, causing heat loss. Layering allows you to take clothing off before you overheat and add clothing as you cool.

D – Keep clothes **Dry.** Moisture will soak into your clothes from both inside and outside. Frost or snow that collects on your clothes will melt, making your clothes wet.

To stay warm, remember the catch word "**COLD**".

CONFIRMATION OF TEACHING POINT 3

QUESTIONS

Q1. What does the acronym COLD stand for?

Q2. Why should your clothes be clean?

Q3. Why should clothes be in layers?

ANTICIPATED ANSWERS

A1. Clean clothes, avoid overheating, loose layers, and dry clothes.

A2. Clothes should be clean so dirt and grease do not fill the air pockets, allowing air to flow around the body.

A3. When clothes are worn in layers, they can be added and removed depending on how warm you are.

Teaching Point 4 **Discuss maintaining body heat.**

Time: 5 min Method: Interactive Lecture

MAINTAINING BODY TEMPERATURE

As said previously in this lesson, the body has to maintain a certain body temperature. The body does this in two ways: heat gain and heat loss.

Heat Gain. The body increases heat production in two ways:

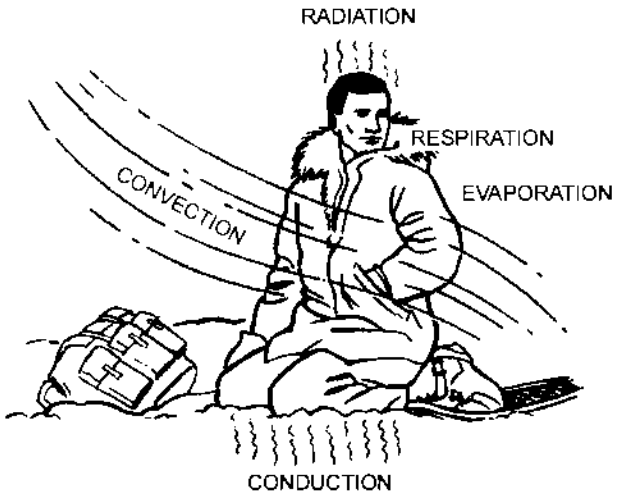
- **Muscular.** Heat is generated within the body by muscles performing physical work. When cool, the body will resort to shivering, which consists of uncontrolled, irregular, and uncoordinated contractions of voluntary muscles. Unlike animals, humans do not have any special features of the body that allow them to gain heat in cold weather. We do have brains though, and through physical activity, special clothing, shelter and an ability to build a fire, people can help maintain normal body temperature in a cold weather climate.
- **Metabolic.** Heat production to tissues may be increased by metabolic chemical reactions taking place, mostly in the liver, but is not significant enough to warm the entire body. The human body is like a car, and food is your fuel. Some foods are better for you than others. Carbohydrates give great boosts of energy to do more physical activity. It is important to eat three meals a day and snacks in between meals

as well as when you feel hungry. Eating nutritious food and lots of water, allows the body to work to its maximum potential.

Heat Loss. The body naturally cools itself down by sweating. Approximately 90 to 95 percent of heat is expelled through the skin, and the remainder is expelled through the lungs during respiration.

Body heat is lost from the skin in four ways (see Figure 1):

- **Convection.** Occurs when air, or water that has a temperature below that of the body, comes into contact with the skin and subsequently moves away. While in contact with the body, the air is warmed. Cool air that replaces it must also be warmed. The heat that warms the air is lost whenever the air moves away. The greater the difference in temperature between the body surface and the speed with which the air is moving, the greater the heat loss.
- **Conduction.** Is the transfer of heat energy away from the body by substances with which it is in direct contact. Air conducts heat poorly and still air, which does not cause convective heat loss, is an excellent insulator.
- **Evaporation.** With heavy sweating, also comes insensible sweating. Insensible sweating can happen in cold weather as well as warm weather. Cold air is dry and has to be moistened by the body to avoid injuring the lungs.
- **Radiation.** Largest source of heat loss, it consists of the direct emission or absorption of heat energy. The human body continuously radiates heat to nearby solid objects that have a cooler temperature. In a cold environment, nearby solid objects are colder and radiant heat loss is greater.



http://brooksidepress.org/Products/Operationalmedicine/DATA/operationalmed/Manuals/cold/TC213Chapter6HygieneandFirstAid.htm

Figure 1 Mechanisms of Heat Loss From the Body

CONFIRMATION OF TEACHING POINT 4

QUESTIONS

Q1. What are the two ways the body maintains normal temperature?

Q2. What is an involuntary movement the body does to gain heat when it is losing it?

Q3. What are the four ways in which the body loses heat from the skin?

ANTICIPATED ANSWERS

A1. Heat loss and heat gain.

A2. The body involuntarily shivers.

A3. The body loses heat through convection, conduction, evaporation, and radiation.

END OF LESSON CONFIRMATION

QUESTIONS

Q1. Which is warmer, several medium weight layers or one thick layer of clothing?

Q2. How often should you change your socks?

Q3. What does the acronym COLD stand for?

ANTICIPATED ANSWERS

A1. Several medium layers of clothing.

A2. As often as possible, and as soon and they become wet.

A3. Clean Clothes, avoid Overheating, Loose Layers, and Dry clothes.

CONCLUSION

HOMEWORK/READING/PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

You can enjoy winter activities and training if you know how to select the proper clothing and take care of yourself by being prepared for the elements.

INSTRUCTOR NOTES/REMARKS

This period may be conducted as a stand alone lesson or as pre-training to EO C121.05 (Participate in Cold Weather Training).

This lesson is best delivered under the supervision of a cold weather instructor.

REFERENCES

A2-009 A-CR-CCP-107/PT 002 DCdts. (1978). *Royal Canadian Army Cadets Course Training Plan Corps Training Program Winter Adventure Training Manual.* Ottawa, ON: National Defence.

C2-031 (ISBN 0-89886-024-5) Wilkerson, J., Bangs, C., and Hayward, J. (1986). *Hypothermia, Frostbite and Other Cold Injuries. Prevention, Recognition and Prehospital Treatment.* Seattle WA: The Mountaineers.

C2-037 Brookside Press. (2005). *Hygiene in the Field.* Retrieved 25 May 2006, from http://brooksidepress.org/Products/Operationalmedicine/DATA/operationalmed/Manuals/cold/TC213Chapter6HygieneandFirstAid.htm.

ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 13

EO C121.04 – RECOGNIZE THE EFFECTS OF COLD WEATHER

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-701/PG-001, *Green Star Qualification Standard and Plan*, Chapter 4. Specific uses for said resources are identified throughout the instructional guide within the TP for which they are required.

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

PRE-LESSON ASSIGNMENT

Nil.

APPROACH

An interactive lecture was chosen for this lesson to introduce the cadets to the effects of cold weather.

INTRODUCTION

REVIEW

The pertinent review for this lesson will include:

QUESTIONS

Q1. What layers make up the layering system?

Q2. What would be a good base layer material?

Q3. Name two benefits of the self-inflating pads.

ANTICIPATED ANSWERS

A1. Base layer, insulating layer, and outer layer.

A2. Polypropylene.

A3. Very comfortable, warmer, lightweight and better thermal insulation.

OBJECTIVES

By the end of the lesson the cadet shall be expected to recognize the effects that cold weather can have on the body, and how to treat and prevent cold-related injuries and conditions.

IMPORTANCE

Cadets need to know how to prevent, recognize, and treat cold weather injuries. Knowing how to properly identify various cold-related injuries and taking proper preventative measures will ensure a safe, fun, and meaningful training experience in cold weather.

While the cadet will learn to prevent, recognize and treat basic cold weather injuries and conditions, it is to be made clear that immediate reporting to an adult supervisor or senior cadet should be the first action if there is ever any question or concern.

Teaching Point 1 **Discuss facts about injuries that occur in cold weather.**

Time: 10 min Method: Interactive Lecture

FACTS ABOUT INJURIES THAT OCCUR IN COLD WEATHER

Bleeding. Wounds bleed easily in cold weather because the low temperature prevents the blood from clotting. Increased bleeding increases the chance of going into shock. Also, wounds open to the cold weather will freeze quickly. The body loses heat around the wound as blood soaks the skin. Further, the clothing is usually torn around an open wound, allowing for further heat escape.

Shock. Shock is a condition that is caused by the reduction of effective circulation blood volume. It can be caused by a number of things including severe injuries, loss of blood and pain. The normal reaction of the body to severe cold is very similar in its reaction to shock. Therefore, shock will develop more rapidly and progress more deeply in extreme cold than in normal temperatures. Signs of shock include apprehension, sweating, thirst, pale skin, faint and rapid pulse, and cold and clammy skin.

Serious Injuries. Just like training in warm weather, medical attention should be sought for all serious injuries such as; broken limbs, deep or severe lacerations, respiratory illnesses, etc.

Signs are things that you can **see** on the victim. Symptoms are things that the victim **tells** you they feel.

CONFIRMATION OF TEACHING POINT 1

QUESTIONS

Q1. Why do wounds bleed more easily in cold weather?

Q2. What are some signs of shock?

Q3. Is pale skin a sign or a symptom?

ANTICIPATED ANSWERS

A1. The cold weather prevents blood from clotting.

A2. Any of the following: apprehension, sweating, thirst, pale, faint, rapid pulse, and cold clammy skin.

A3. Pale skin is a sign. It can be seen by an observer.

Teaching Point 2 **Identify cold weather injuries.**

Time: 10 min Method: Interactive Lecture

COLD WEATHER INJURIES

Snow Blindness. Snow blindness is caused by the infrared or ultra-violet rays reflecting from a snow covered surface. These rays, unlike visible light rays, are readily absorbed by clear or coloured glass. Snow blindness is greatest on dull, cloudy days or when crystalline snow mist is present. Resting in darkness is the best treatment. Symptoms usually appear within six to eight hours, and include an irritating feeling in the eyes, blurred vision, pain, and the eyes feeling hot and sticky.

Most minor cases of snow blindness will recover within 18 hours without medical attention. A severe case may take three to four days to recover.

Immersion Foot. A cold injury resulting from exposure to temperatures near freezing. The temperature does not have to be below 0°C for it to occur. In the early stages, the feet and toes are pale and feel cold, numb, and stiff. Often walking becomes difficult. If no treatment is given, the feet will swell and become very painful. In extreme cases the flesh dies, and amputation is needed.

It is difficult to feel immersion foot in the early stages. In order to assist in prevention of immersion foot, be sure to keep feet clean and dry, checking them often. Rub and massage them when changing socks.

CONFIRMATION OF TEACHING POINT 2

QUESTIONS

Q1. When do symptoms of snow blindness usually appear?

Q2. What causes immersion foot?

Q3. What are some serious injuries that will require medical attention?

ANTICIPATED ANSWERS

A1. Symptoms of snow blindness usually appear in six to eight hours.

A2. Immersion foot is caused by exposure to temperatures near freezing.

A3. Severe lacerations, respiratory difficulties, and broken limbs are some serious injuries.

Teaching Point 3 **Explain frostbite.**

Time: 10 min Method: Interactive Lecture

FROSTBITE

Frostbite is the freezing of tissue in the body. As blood flow slows down, the fluid between cells can freeze. As ice crystals form on them, the cells become dehydrated. Frostbite acts locally on parts of the body such as fingers, toes, chin, nose and ears. It is a constant hazard during activities occurring in sub-zero temperatures, especially when accompanied by strong winds.

Signs and symptoms of frostbite stages:

Surface Frostbite. Also known as superficial frostbite or frostnip, it affects only the outer layer of skin and causes little damage. It may result from direct contact with cold metal or severe wind chill. After the nipped area is warmed, the layer of frozen skin becomes red, and after a few days, the skin will peel, looking similar to sunburn. Signs and symptoms include:

- skin turns white and numb;
- tissues beneath the affected area are still soft;

- casualty may not feel it; and/or
- partner may notice a white spot.

Deep Frostbite. Frostnip has progressed into underlying tissue. It may feel hard on the surface, and soft below. Blisters will usually appear within 24 hours of warming. It needs proper warming, not just an application of heat. If it progresses even further, the injury extends into deeper tissue and into the muscle. Blisters containing fluid, blood–filled blisters, delayed blisters or lack of blisters forming within 48 hours of warming indicate deep frostbite. It may cause loss of tissue and permanent damage, including the loss of parts, or all of the affected area (e.g. hands). Proper field care can often mean the difference between temporary disabilities and permanent injuries. Signs and symptoms include:

- pain or numbness in the fingers, toes, heels, and entire hands and feet;
- tissue is hard all around the affected area;
- the frostbitten part is cold and white (sometimes purple); and/or
- no pain, or feeling of any kind, in the extremity that is frozen.

PREVENTION

Surface. Is common on the face, and is associated with naturally occurring wind, or wind from a moving vehicle. A good parka tunnel will usually prevent frostbite because it holds a pocket of warm air around the face. In strong winds, cover nose and cheeks with a facemask, scarf, or any piece of warm fabric. Since frostbite is often not felt, the first warning may come from a companion who notices a white spot on your face. Frostbite is also common on the hands if doing work, or if coming into contact with cold metal.

Deep. Often occurs when exposed to freezing temperatures with no chance to warm up, or when hands and feet become wet and freeze. It is important to eat often to maintain body warmth, drink often to avoid dehydration, and rest enough to avoid fatigue while restoring circulation. Warm numb and painful feet immediately.

TREATMENT

Do not use snow, oil, rubbing, massage or pressure.

Surface. Serves as a warning. A frozen nose is the most common type of a surface frostbite. Most minor surface frostbite can usually be thawed using body heat. Place a warm palm against a frostbitten cheek or ear, and place frostbitten hands against your chest, between your thighs, or under your arm pits. Surface frostbite that produces blisters may require evacuation for medical attention.

Deep. Remove all constricting clothing such as boots, gloves or socks, without causing further damage to the frostbitten area. The frozen part should be placed against an unfrozen part of the body or exposed to warm air. Rapid thawing by the application of external heat is the safest way to relieve frostbite. Clean and dress the area to avoid infection. Do not exercise the injured person, or warm them in front of open fire. Do not allow the frostbitten part to become frozen again. Evacuate for medical attention.

CONFIRMATION OF TEACHING POINT 3

QUESTIONS

Q1. What are the two stages of frostbite?

Q2. What layer of skin is frozen if you have surface frostbite?

Q3. What is the most common body area affected by surface frostbite?

ANTICIPATED ANSWERS

A1. Surface and deep.

A2. Only the outer layer of the skin.

A3. A frozen nose.

Teaching Point 4 **Explain hypothermia.**

Time: 10 min Method: Interactive Lecture

SIGNS AND SYMPTOMS OF HYPOTHERMIA

Cold exposure, or hypothermia, is the cooling of the body's core temperature. Exposure can be divided into three levels – mild, moderate and severe. It is hard to tell where one level starts and the next stops without a special thermometer.

Signs and symptoms of hypothermia stages:

Mild Exposure. During mild exposure the casualty:

- is awake;
- shivering;
- can answer questions intelligently;
- may be slurring their speech;
- is losing interest in what they are doing; and
- is complaining that they are cold.

Moderate Exposure. During moderate exposure the casualty:

- is confused and illogical;
- does not want to move much, and may be sleepy;
- is clumsy and stumbles;
- stops shivering;
- shows signs of muscle stiffness;
- has slow breath and pulse rates;
- may have a fruity odour to breath;
- may have dilated pupils; and
- may urinate in clothing.

The casualty is in great danger and is close to severe hypothermia, unconsciousness and death.

Severe Exposure. Moderate exposure quickly becomes severe exposure. At this point the casualty is in a coma, and is close to death. In severe exposure, the casualty:

- is barely conscious;
- has slow, shallow breathing and a weak, slow, irregular or absent pulse; and
- has pale, very cold, perhaps bluish skin.

During this time, the casualty will appear dead. It is important to remember, that though they may look dead, there still may be an indetectible pulse, and some respiration. You can not determine if someone is dead until the body has warmed up and there is still no sign of life.

PREVENTION

There are a number of things a person can do to help prevent exposure.

- Prepare for the worst and take extra clothing.
- Avoid overheating and sweating. Wear loose, layered clothing that breathes. Cotton wets easily and dries slowly. Wool is warm, even when wet. Modern fabrics such as polypropylene and polyester are superior next to the skin.
- Avoid long term cooling. The effects of cold exposure are cumulative, making long term exposure dangerous. Take breaks for hot drinks, and try to get out of the wind. Do not continue on if you are getting seriously cold.
- Eat often to provide fuel for your body. It is important, in addition to the main meals provided to you during winter training activities, to have healthy, high-energy snacks for consumption between meals. Food items such as trail mix (nuts, fruits, grains) will burn longer in the body, providing a more sustainable energy level for cadets. Items like chocolate are metabolized too quickly, and will lead to a cadet “crashing”, or running out of energy too soon.
- Drink lots. Dehydration is a major contributor to exposure. Hot, sweet drinks are best, but you can also drink cold water. Do not eat snow if you are cold, as it may contribute to lowering your body’s temperature even farther.
- Keep your big muscles moving. This creates heat. Keep wiggling your toes and fingers if they are cold. Wiggling them will not warm you up too much, but moving the larger muscles of the arms and legs will. Swing your arms vigorously, stamp your feet, and place the hands in the armpits.
- Check your companions often. If they get clumsy, start to shiver, slur their speech, or act strangely, you can suspect exposure. Remember that people suffering from exposure do not always feel it.

TREATMENTS

Mild Exposure. If you think that your companion is suffering from mild exposure, you should:

- stop travelling;
- prevent any further loss of body heat;
- get them into shelter;
- replace any wet clothing;
- allow shivering to continue as it is the body trying to warm up; and
- give them food and hot drinks.

Re-warming with skin-to-skin contact or sleeping bags is the best way to help the person.

Moderate Exposure. If the casualty is suffering from moderate exposure, treat them for mild exposure, except:

- avoid rough handling and do not let them walk;
- do not give fluids to drink until they are awake, and understand what is going on. This will prevent choking; and
- seek medical attention.

Never handle anyone in moderate exposure roughly, or allow them to move much, as this affects the heart and can cause it to fail quickly.

Severe Exposure. There must be medical treatment at this time. There is some treatment that you can give to a casualty showing signs of severe exposure. They are:

If there is any breathing or a pulse, you should:

- handle the casualty very gently;
- prevent further heat loss; and
- move them gently to medical care.

If medical attention is not available, and you are far from help, you should:

- immediately and gently move them into warm shelter;
- apply heavily wrapped warm water bottles to sides of their neck, chest and groin. Do not put them anywhere else; and
- keep them warm and let them recover very slowly without moving them.

It is very important that the water bottles be only slightly warm, as too much heat will damage the skin. Do not rub the hands, feet or legs or move them if you do not have to. If the casualty recovers, the hearing is the first to return, then the sight. They may lose control of their bowels.

CONFIRMATION OF TEACHING POINT 4

QUESTIONS

Q1. What are the three types of exposure?

Q2. What are some things you can do to prevent exposure?

Q3. What is the best way to re-warm someone with mild exposure?

ANTICIPATED ANSWERS

A1. Mild, moderate and severe.

A2. Any of the following: take extra clothing, avoid sweating and long term cooling, eat often, drink lots, keep active, and check each other often.

A3. Skin-to-skin contact or a sleeping bag.

Though a person may look like they are dead, they may still be breathing, and need medical attention immediately.

Teaching Point 5 **Discuss winter hygiene.**

Time: 10 min Method: Interactive Lecture

BODY CLEANLINESS

To stay healthy on cold weather exercises, it is important to keep clean. While the body tries to stay warm, perspiration can clog pores in the skin and the clothes, making you feel colder. It is not always easy to properly clean yourself, because of the lack of sanitary facilities, but there are some rules that will keep you healthier and feeling better longer.

Washing. Wash your face and hands daily. Though there are no baths around, you should try to wash your feet, crotch and armpits at least twice a week - and more often if possible. These are areas where most of the heat of the body is lost; therefore, there is more perspiration in these areas.

Shaving. Shave every day. It is best to do it before bed as the body is warmer and it should be easier. Shaving in the morning may also strip the skin of essential oils.

Teeth. Teeth should be cleaned daily. If you do not have a toothbrush, wrap gauze around your finger and rub over your teeth. Cleaning the teeth will help prevent germs from growing as well as make you feel better.

Changing Clothes. Underwear and shirts should be changed at least twice weekly. If not, then they should be crumpled, shaken out, and aired out for about two hours. As clothes become dirty, warm air is not able to circulate around the body, increasing your chances of overheating.

Foot Care. Socks should be changed and feet washed as often as possible, but at least twice a week. Boots and socks should be removed every night and the feet massaged and dried. Use foot powder if you have it.

BODY FLUIDS

In order to keep the body in the healthiest and cleanest state for winter camping, you must drink plenty of fluids. Dehydration is one of the largest contributors to cold-related illnesses such as exposure. The body loses a lot of fluid through evaporation, conduction, respiration, radiation and convection. The fluid must be replaced so the body is able to function effectively in the cold weather.

The body needs to expunge bodily fluids such as urine, and waste, on a regular basis to maintain its healthy state.

Keeping clean will make you feel more comfortable and help motivate you to train and enjoy the activities associated with training in cold weather.

CONFIRMATION OF TEACHING POINT 5

QUESTIONS

Q1. How often should you wash your hands?

Q2. Why must you drink plenty of fluids while in cold weather?

Q3. True or false: Cadets will use the washroom less often in the winter.

ANTICIPATED ANSWERS

A1. You should wash your hands daily.

A2. You have to drink lots of fluids to replace the ones your body has lost.

A3. False. A cadet will still need to go the bathroom as often as they normally would.

END OF LESSON CONFIRMATION

The instructor may chose to utilize an activity where the cadets will be given a card detailing a sign or symptom of an environmental injury or condition. The cadet will then, as a means of confirming understanding of the material, act out the illness associated with the sign or symptom on the card. This will demonstrate an understanding on the part of the cadet acting out the associated ailment, as well as gauge the understanding of the cadets required to guess the injury or condition.

Alternately, the following questions can be asked.

QUESTIONS

Q1. What are some signs of shock?

Q2. When do symptoms of snow blindness usually appear?

Q3. What causes immersion foot?

Q4. What are some serious injuries that will require medical attention?

Q5. What layer is frozen when you have superficial frostbite?

Q6. What is the most common body area affected by superficial frostbite?

Q7. What are the three types of exposure?

Q8. What are some things you can do to prevent exposure?

Q9. What is the best way to re-warm someone with mild exposure?

Q10. How often should you wash your hands?

ANTICIPATED ANSWERS

A1. Any of the following: apprehension, sweating, thirst, pale skin, faint, rapid pulse, and cold, clammy skin.

A2. Symptoms of snow blindness usually appear in six to eight hours.

A3. Immersion foot is caused by exposure to temperatures near freezing.

A4. Severe lacerations, respiratory difficulties, and broken limbs are some serious injuries.

A5. Only the outer layer of the skin.

A6. A frozen nose.

A7. Mild, moderate and severe.

A8. Any of the following: take extra clothing, avoid sweating and long term cooling, eat often, drink lots, keep active, and check each other often.

A9. Skin-to-skin contact or a warm blanket.

A10. You should wash your hands daily.

CONCLUSION

HOMEWORK/READING/PRACTICE

Nil.

METHOD OF EVALUATION

Nil.

CLOSING STATEMENT

Every year people are injured, including dying of exposure, because they don't recognize the risk factors and the signs and symptoms of cold weather injuries in time to prevent the injury. Cadets can be proactive in the recognition of signs and symptoms and can protect their buddies from injury by being aware that anyone, even an officer, can suffer a cold weather injury.

INSTRUCTOR NOTES/REMARKS

This period may be conducted as a stand alone lesson or as pre-training to EO C121.05 (Participate in Cold Weather Training).

This lesson is best delivered under the supervision of a cold weather instructor.

REFERENCES

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ROYAL CANADIAN ARMY CADETS

GREEN STAR

INSTRUCTIONAL GUIDE

SECTION 14

EO C121.05 – PARTICIPATE IN COLD WEATHER TRAINING

Total Time:	18 x 30 min

No instructional guide is provided for this EO, refer to A-CR-CCP-107/PT-002, *Royal Canadian Army Cadets Course Training Plan, Corps Training Program*, Winter Adventure Training Manual, for activities.

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