CROSS-COUNTRY SKIING

4-H ADVENTURE/CHALLENGE PROJECT

Prepared By: Erika Thiel
2004
CROSS-COUNTRY SKIING
ADVENTURE/CHALLENGE PROJECT

Please Note: Participants MUST own equipment or have access to equipment rentals. Equipment will NOT be provided.

Materials for Members:
- Cross-Country Skiing Adventures Manual (For member & leader use)
- 4-H Project Record Book (#91950)

Project Objectives (Youth will):
1. Learn about different types of cross-country skiing equipment
2. Learn how to dress appropriately for a ski trip.
3. Learn how to plan a ski trip.
4. Learn about trail courtesies
5. Learn about trail safety
6. Learn skiing techniques
7. Learn about wildlife habits in winter months.
8. Learn about the natural resources in the areas skied in.
9. Discuss Health issues related to Cross-Country Skiing (Safety, Physical Conditioning, and Nutrition)
10. Learn Map and Compass Skills.
11. Keep a record of project costs.
12. Take a minimum of 2 group ski trips, distance determined by the abilities of the participants and leader.

Requirements:
1. Set goals for your project.
3. Give an oral presentation (speech, demonstration, or illustrated talk) related to this project.

Exhibit:
1. Member’s Manual
2. Completed Project Record Book
3. Visual Display
   (one of the following)
   - A poster (14x22) or display illustrating something you learned in the project this year.
   - A scrapbook of labeled pictures related to the project
   - A labeled photo story depicting something related to the project.

Guidelines:
Manual is designed as a guide. Not all activities will be completed during the first year.

First Year-Youth will learn:
- Equipment and Dress
- Technique
- Safety
- Nutrition
- Environment

Second Year-Youth will learn:
- Must know items covered in 1st year; will build on those skills
- First-Aid
- Orienteering
- Equipment
- Plan Activity (2-3 hour trip)
- Advanced Techniques

Third Year-Youth will learn:
- Must know items covered in 1st & 2nd year; will build on those skills
- Physical Conditioning
- Plan a full day trip
LET THE ADVENTURES BEGIN!

Dear 4-H Adventure/Challenge Project Members & Leaders

Adventure Life Sports, such as Cross-Country Skiing allow participants the opportunity to
- Learn more about themselves
- Develop skills in life-long activities
- Discover more about the environment and how to enjoy it
- Develop skills essential to participation in other adventure projects

The 4-H Youth Development program promotes the concept of learning-by doing before being told or shown how. The five step experiential process helps turn activities into learning experiences. The experiential process of learning engages youth in the activity, encouraging them to think more, explore, question, make decisions and apply what they have learned. You will note that each of the activities follows the five-step model.

EXPERIENTIAL LEARNING MODEL

1. EXPERIENCE (Do)
   This is the “doing part of the activity. It immediately focuses the attention to the youth rather than the helper. Encouraging the young people to learn by doing before first being told or shown how presents opportunities for life skill development. You act as the facilitator or the “guide by the side” in the experience, providing structure and the environment for the youth to create. You observe and add value to the experience by providing resources, information and asking questions rather than first demonstrating or lecturing.

2. SHARE (Reflect)
   What happened in this experience? What did you do? What did it feel like to do this activity? These are “Reflect” questions to ask the youth. This is the time for youth to generate information and share their observations with one another. Youth who contribute should feel their ideas are important and valued. Encourage the youth to answer each other’s questions rather than you answering.

3. PROCESS (Reflect)
   What was the most important about what you did? What did you learn? Common themes that emerge from the sharing discussions are further explored.

4. GENERALIZE (Apply)
   The “Apply” step is a time to talk with the youth. The discussion becomes more personal. So what? Now what? What did the discussion mean to you personally or to your everyday life? The subject matter alone could remain the focus of the discussion, but Outdoor Adventure encourages the process to include life skill development.

5. APPLY
   Youth can express what they really learned and how they can use what they learned in other areas. Or they can actually show that they have mastered a skill by performing another activity requiring use of a new skill.
On this page you will learn about Cross-Country Skiing essentials—the gear you will need to let the adventures begin! The essentials for Cross-Country Skiing are:

- Skis
- Ski Boots & Bindings
- Poles

**SKIS**

Cross-Country skis should have the features that will offer a smooth surface as the skier glides on the snow and at the same time, prevent the skier from sinking too deep into the snow.

Cross-Country skis are longer, slimmer, and more lightweight than those used in Alpine Skiing. The contact points, or the glide zones, are the tips and tails of the skis. These are designed to give very little resistance when the skier is making forward moves.

The camber, or the kick zone refers to the central portion of the ski. This has a pattern on the base which allows the ski to take hold of the snow when weight is pressed on it, particularly during the stepping motions.

Due to new technology and design, skis have been getting gradually shorter. No longer can you select the right length by simply raising your arm and measuring to your wrist. Body weight is much more the determining factor in addition to the type of skiing you will do (terrain) and skiing ability.

**SKI BOOTS & BINDINGS**

The motion of Cross-Country Skiing requires that your boots allow your ankle to bend and stretch while skiing. Ski boots must be both flexible and soft so that it allows the skier to bend forward and up on the toes regardless of the fact that the ski bindings are fastened to the toe of the boot. Therefore, it is important that the binding is compatible with your ski boot. This combination features a free-heel system where the heel can lift from the ski surface. It is preferred if your bindings have heel plates which prevents sidelong movements by providing a gripping surface when the skier goes down the slope and around corners.

**SKI POLES**

The old measuring stick of under your arm pit is a thing of the past. A pole that reaches the top of your shoulder is more efficient when you climb hills. Make sure they have a comfortable, adjustable strap assembly that allows for a full range of poling motion. If you ski on groomed, maintained trails, your pole baskets can be relatively small. If your plans include occasional touring outside of groomed areas, look for slightly larger pole baskets.

Cross-Country Skiing
Alpine Skiing
Groomed
Ski
Ski Pole
Ski Pole Basket
Binding
Camber
Contact Points

**DISCUSSION TOPIC**

WAX VS. WAXLESS SKIS
GEARING UP

As you get ready for your first ski trip you will need to decide what gear you need to take. It is important to consider the climate, the activity you will be doing. The gear you choose will affect your comfort and safety.

From the list below, of possible items to take with you on a Cross-Country Skiing trip, check those you believe are essential, those that

<table>
<thead>
<tr>
<th>ITEM</th>
<th>ESSENTIAL</th>
<th>HELPFUL TO HAVE</th>
<th>NOT NEEDED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bandana</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pocket Knife</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sun Protection</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walkman</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Duct Tape</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Whistle</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Down jacket</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cell Phone</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flashlight/Batteries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mirror</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wool/Synthetic socks</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T-shirt</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toilet Paper</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Binoculars</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poly-pro tops &amp; bottoms</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compass, Map</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Matches, Fire Starter</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Food</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
MAKING TRACKS

Share the Experience
• What gear did you select
• What personal gear is essential for every trip regardless of climate or season?
• Why is layering so important?

Reflections
• What attracted you to certain gear?
• How can a goose down jacket represent a good or bad choice in clothing and layering options?

Now What?
• What did you learn about decision making through your gear selection?
• How are you responsible to others by what you choose to bring on a trip?

XC Skiing Essentials

☐ Clothing – extras in case you get wet or chilled (gloves, hat, socks)
☐ First Aid Kit - hopefully you won’t need it, but accidents do happen and it’s better to be prepared
☐ Headlamp or Flashlight & Batteries – headlamps or similar devices keep your hands free, just in case your day trip goes into nightfall.
☐ Food - XC Skiing burns calories and you will need to refuel.
☐ Canteen – you will get dehydrated, no matter how clean a stream looks, it may not be safe to drink without treatment.
☐ Map & Compass – you need to know where you are and where you are going is important.
☐ Sun Protection - goggles/sunglasses and sunscreen to protect yourself from the sun’s rays.
☐ Matches/Fire Starter – for a day trip you may not plan to use them, but in an emergency situation or if you became lost, these are very helpful. Make sure matches or lighter and fire starter are in a waterproof container such as a plastic bag. Good fire starter—dryer lint and candles.
☐ Pocket Knife – handy and necessary for all sorts of tasks.

Safety Tips
• Tell someone where you plan to go and when you expect to return
• Do not ski alone
• Wear pile, wool, or polypropylene clothing to keep you warm, dry, and comfortable
• Avoid danger by skiing in areas you are capable of skiing safely
You have learned about the gear and essentials for your trip. Putting all of your essentials in a backpack will allow you to be prepared and as soon as you pack it you will be ready to go! This activity will help you learn the parts of your pack and how to pack it.

Pack the items you selected in the previous activity into your backpack or bag. Draw on the outline of the backpack where you packed each of your items. When you have everything you want to take on your day hike walk around your yard, go up and down stairs or a steep slope to see how comfortable your backpack is. Finally practice adjusting each part of your backpack so it best fits your body and your Skiing needs.

**Additional Items:**
you may want to pack

- Camera
- Binoculars
- Duct Tape
- Mirror
- Rope
- Toilet Paper
- Whistle
- 50’ Rope or nylon cord

**Safety Tips:**

- A cell phone seems like a valuable item to have on a ski trip but reception may not be possible in remote locations
- Stay tuned to local weather forecasts
- Avoid Avalanche areas
MAKING TRACKS

Share the Experience
• What factors did you decide were important in selecting your backpack?
• How did you feel after carrying your pack for five, fifteen, and thirty minutes?

Reflections
• How could your choice of a backpack and your packing methods affect your skiing experience?

Now What?
• How is packing a backpack like making decisions about what resources (time, money, energy) to use in other situations?

BACKPACK SELECTION

• Consider using a school backpack for a simple day trip
• You will be outside and weather conditions can change rapidly, try to select a pack that is waterproof
• Comfort is a must, you don’t want an uncomfortable pack distracting from your fun. Select a pack that has wide straps that do not cut into your shoulders.
• Skiing requires movement and balance. Make sure your pack allows you to move your arms freely and distributes the weight evenly.
• If you have a pack that doesn’t have a lot of compartments put your gear in colored pouches or stuff sacks to help you find the contents easily

PACKING YOUR BACKPACK

• Place heavy items close to your back and near the bottom of the pack.
• Pack lighter weight items around the heavier items—like clothing
• If you do not have a waterproof backpack or pack over store items in re-sealable plastic bags.
• You pack may say it is waterproof but to be on the safe side, pack all fire starting materials in a re-sealable plastic bag.

TIPS
• Practice adjusting your backpack with different weights in it
• Make sure your headlamp or flashlight has new batteries
FIRST AID KIT

Outdoor activities have a heightened risk of injuries happening. Prevention is the key to avoiding injuries, yet it is important to be prepared should they occur. Before you embark on an adventure you should have some basic knowledge about what you can and should do if you are confronted with a first aid situation and how to use everything in your first aid kit. You will not have time in the middle of an emergency to read an instruction manual. In this activity you’ll prepare a first aid kit and learn the basics about first aid.

THE BASICS

- **Remain Calm and in Control** Keep yourself and the victim calm. Make the victim as comfortable as possible.
- **DR. ABC**
- **D-Danger** Check the danger and source of the injury inflicted to the victim. Make sure the danger has passed and the surrounding area is safe. There is no use of becoming a victim yourself. Assess the situation.
- **R-Response** Check the response of the victim by simply asking them how they are. IF they can answer your question then that tells you that the victim is conscious, breathing, and that the heart is working. If the victim is unable to respond move onto the ABC:
  - **A-Airway** Make sure that the victim has an open airway. Tilting the head back with the chin facing up will clear an airway
  - **B-Breathing** Make sure that the victim is breathing, look and listen to exhales of breath and feel for air coming out of the nose or mouth.
  - **C-Circulation** Make sure that the victim has blood circulation. Check for a pulse and visual signs such as complexion and blinking of the eyes.
  - **Send for Professional Help** If you are with multiple people assign one person to call for aid. Explain calmly and clearly the location of the accident and the condition of the victim.

A variety of first-aid kits are available on the market. Look at what you have at home with an adult before you go out and make a purchase. Your kit should be tailored to what you will be doing, weather, and your medical needs if any (allergies, asthma, etc.) Write down the supplies you already have at home in the chart below. Check the condition of the supplies and dates of medications. Then look over the list of items in Making Tracks you should have in your First Aid Kit. Complete the chart with the items you will need to purchase.

<table>
<thead>
<tr>
<th>First Aid Supplies I Have</th>
<th>First Aid Supplies I Need</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Outdoor Skill: Preparing a basic first aid kit
Life Skill: Personal Safety
Success Indicators: prepares a first aid kit
MAKING TRACKS

Share the Experience
• What did you find in your medicine cabinet?

Reflections
• How do you feel about handling a first aid situation during your adventures?

DISCUSSION TOPICS
• Frostbite and hypothermia
• Snow Blindness
• Heat stroke or exhaustion
• Burns, including sunburn
• Animal and insect bites and stings
• Blisters
• Sprains and strains
• Poisonous plant and animal reactions

TAKE IT ONE STEP FURTHER
• Set up a first-aid safety course for your club or sign up for a CPR/First Aid Class
• Take a trip to a local hospital to learn how advanced first-aid is administered
• Ask a doctor, nurse, ambulance driver, first-aid instructor, or EMT to speak to your group
• Make a chart identifying the uses of each item in the first-aid kit
• Give a report on hypothermia, including how to protect against it

First Aid Kit Items
• Gloves (latex or vinyl)
• 1 elastic-roll bandage
• Aspirin/Ibuprofen
• Adhesive tape
• Band-aids (assorted sizes)
• Gauze pads (2x2 and 4x4)
• Moleskin, 1 or 2 packets
• Tweezers
• Triangular bandage
• SAM Splint (optional)
• Safety pins
• Scissors
• Sanitary Napkins (for bleeding wounds)
• Antiseptic/Antibacterial ointment
• Cotton swabs (sterile, packaged in pairs)
• Diarrhea medicine
• Butterfly bandages
• Gauze rolls (2)

Inspect the contents before every trip and make sure the tools are clean and supplies are in good condition. Replace expired medicines. Make a list of kit contents and keep it current. Add items you wished you had brought on the last trip. Make sure the container is durable and waterproof, stow it in an accessible compartment of your backpack.

Expiration, CPR, First Aid, Frostbite, Hypothermia, Snow Blindness, Burns, Sprains, Exhaustion, Antiseptic/Antibacterial, Airway, Breathing, Circulation, Pulse, Bandage, Dehydration, Dressing, Exposure
As you have learned, gear selection is key to your enjoyment during your skiing adventures. In this section we are dissecting ski gear, layer by layer. Layering your clothes will allow you to add or take away clothing items during your adventure. Dressing in layers means not just wearing one big coat, it entails several items. For example thermal underwear, a shirt, then a fleece jacket topped off with a windbreaker or shell.

**BASE LAYER**
- 1. Thermal Body Shirt
- 2. Thermal Pants
- 3. Ski Socks

The base layer is the wicking layer. Do not put a cotton T-shirt under this layer. In order to stay warm the layer next to your skin MUST stay dry. Synthetic fabrics like polypropylene move perspiration away from your body to the outer layers.

**MIDDLE LAYER**
- 4. Fleece Jacket or Wool Sweater
- 5. Ski Pant

The middle layer is the insulating layer. Synthetics again are the best because they wick moisture, insulate, and are easy to pack.

**OUTER LAYER**
- 6. Hat
- 7. Shell
- 8. Gloves

The outer layer protects you from wind and snow. You lose a lot of heat through your neck and head.
MAKING TRACKS

Share the Experience

- What types of fabrics are you wearing today?
- What fabrics listed in this activity did you find in your own drawers and closets?

Reflections

- Why is cotton a poor fabric choice?
- Why do you need to know how your body gains and loses heat when you are outdoors?

Now What?

- Describe what other activities where clothing plays such an important role.

Body Heat Science

Outdoor clothing has two purposes. It protects you from wind, rain and snow. More importantly it insulates your body and keeps you warm. You can lose body heat in four different ways - conduction, convection, radiation, and evaporation.

- Radiation – all exposed skin radiates heat and that is why radiation is the leading cause of heat loss. As much as 50-80% of your body heat through your head. Items such as hats and scarves keep radiant heat loss to a minimum.

- Evaporation – As you exercise you will start to sweat. Your body will lose heat through the evaporation of body moisture. That is why it is so important to have a good base layer of clothing. To keep you dry!

- Conduction – grab a piece of ice from your freezer. Notice the ice immediately warms up and starts to melt – and your hand gets cold! In conduction heat flows from a warmer object into a cooler object when they come in contact with each other. On a cold day, clothing helps insulate you from cold things that you may touch.

- Convection – Go outdoors on a breezy day (or you can do this inside with a fan). Notice how your skin gets cooler when the moving air hits it. Heat loss that occurs through convection is caused from air movement across a surface. Your body maintains a thin layer of warm air next to your skin, but wind, rain, or snow against your bare skin reduces that warm layer of air. Windproof clothing stops convection from making you get cold.

Did You Know?

Between 50-80% of your body heat is lost through your head. So, if your feet and hands are cold, put on a hat!
Are you ready to go Skiing? Before you strap the skis on you need a plan of action! This is your opportunity to plan your first Ski trip! There are many aspects you’ll need to consider such as gear you will need, will food be needed? You may choose an area you have always wanted to explore—be sure it’s within your skiing ability! These factors should be considered for each trip you take.

Answer the questions on the planning checklist below. Refer to “Trip Planning Questions” to help you complete the checklist.

### SKI TRIP PLANNING CHECKLIST

<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>When are you going?</strong></td>
<td></td>
</tr>
<tr>
<td><strong>What time are you leaving and what time are you planning to be back?</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Where are you going?</strong></td>
<td></td>
</tr>
<tr>
<td><strong>How are you getting there?</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Who is going (include leaders/chaperones)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>What activities do you have planned?</strong></td>
<td></td>
</tr>
<tr>
<td><strong>What costs are involved with this ski trip?</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Emergency Contact Numbers</strong></td>
<td></td>
</tr>
</tbody>
</table>

Tell a responsible adult about your trip plans—where you are going and when you plan to be back. Leave them a copy of your trip plan.
Making Tracks

Share the Experience
- What do you want to learn on your Ski trip?

Reflections
- How did answering the questions help you plan your trip?
- What did you learn about planning and organizing?

Now What?
- Why is safety so important to consider when planning a trip? What safety issues are addressed with a planning checklist?

Trip Planning Questions

✓ What you are doing What date are you going to go on your ski trip? What time will you leave and return? What do you need to bring? If you are planning on going to a state park you may need to consider trail use and permits.

✓ How will you get there? Will you drive to the trailhead with your family? With friends? With your project leader? Is the trailhead accessible with two-wheel drive vehicles?

✓ Who is going? Never ski alone. It is always a good idea to have an adult/and or leader on the trip.

✓ Where are you going? Make sure you have looked over the maps before you go! Have you looked over the road map to access the trailhead? What is the terrain going to be like? Avoid avalanche areas - Ski within your abilities!!

✓ Why are you going? Will you simply be exploring some new trails on this trip? Are you going to working on technique?

✓ What will you do when you get there? Do you need to pack a lunch for the trail? Will you need to pack a camera or a sketch book to capture the scenery and the things you will see during your adventure?

✓ Are there any costs involved with this trip? Will you need to rent or borrow any skiing equipment (skis, poles, boots)? Will you have to go to the store and buy food/snacks for the trail? Will you need to contribute to gas expenses?

Did You Know?
Land that has a “Wilderness” designation has restrictions that may include: required permit use, limits on group size, and prohibition against motor vehicle use. Be sure to follow all land management guidelines while Cross-Country Skiing.
ESSENTIAL XC SKIING SKILLS

Are you ready to go Ski? Learning to Ski on Cross-Country Skis is easy; if you can walk you can ski. However Cross-Country Skiing is difficult to learn out of a book. The best way to learn to Ski is by doing! Your leader will be able to provide instruction and guide you through the learning process. Books and other resources are useful references to remind you of something that your leader or an instructor has taught. The more references the better as different authors place more emphasis on different aspects of technique. Another way to improve your skills - practice!

Although you are learning to Cross-Country Ski by doing, it is important that you know the things your leader can teach you. What do you want to learn?

- How to stop
- How to fall
- How to get down a hill
- How to slow down
- Push-glide/Diagonal stride
- Skiing without poles
- Snowplow turns
- Traversing a slope
- Sidestepping uphill and downhill
- Step turns during the diagonal stride or during a downhill run
- Kick turn
- Herringbone
- Downhill running
- Double polling
- Stem turns
- Skating turns
- Telemark turns
- Touring in deep snow
- Touring on icy tracks
- Touring on wind scoured snow
- Finding the best route
- Racing technique
- Skating technique

**Ski the Web**

- For a guide to ski areas offered by the Idaho Department of Parks and Recreation go to http://www.idahorec.org/PDF/Xcoun_guid.pdf
- For cross-country skiing web related links visit http://extension.ag.uidaho.edu/boundary/
  Go to the 4-H & Youth link and then Youth projects
Making Tracks

Share the Experience
- What techniques do you want to learn this year?

Reflections
- How did learning techniques by “doing” help you learn how to Cross-Country Ski?

Trail Etiquette
- Be considerate of other recreationists
- Control your speed
- Ski so as not to endanger others
- Keep poles close to your body when other skiers pass
- In case of a fall, clear the track without delay
  - Any depression left in the snow should be filled in with snow and leveled so it won’t create a hazard for others
- Avoid walking on ski tracks
- Keep to your right upon meeting an oncoming skier
- Downhill skiers always have the right-of-way. Step out of track so they won’t have to stop to try to ski around you
- Trail signs must be respected

Now What?
- What can you do to prevent injuries to yourself and others?

Did You Know?
Cross-Country Skiing is fun (of course you know that!) however, with the fun comes work. Discuss what is required to maintain your equipment.
- Skis—check tips and tails
- Check your bindings
- Ski bottoms

Why is maintenance important?
How frequently should it be done?
All travel requires some type of navigation. In traveling from one point to another outdoors one uses visual landmarks, area maps, and a compass to find the route. Accurate return to your starting point will depend upon your ability to remember landmarks and use of a map and compass. Have you used a compass to find your way while on an adventure? In this activity you will practice using a compass in a fun and challenging way.

1. **Making Straight Lines** - With your compass and a buddy create a North-South (N-S) straight line. Get back-to-back with one of you turning the compass to a bearing of 180 degrees (S). This person then turns around and repositions the red needle with the Orienting Arrow. Both of you walk ten steps. You have a N-S line! Now make an East-West (E-W) line. Begin with both of you facing N. One of you turns to a bearing of 90 degrees, the other to 270 degrees. When you each have walked 10 steps, you will have formed an E-W line.

2. **Making Geometric Shapes** - Gather a few markers (rocks, tennis balls, etc.) to use in creating the outlines of various geometric shapes. Place one marker at your feet where you will start making a given shape. Choose a shape that you would like to create from the list shown. Take the first bearing and follow for 10 steps. Place another marker at this point and then take your next bearing. You should try to take steps of equal length. Continue until you and your partner have created your shape.

---

**Trapezoid**

- 10 steps at 30
- 10 steps at 75
- 17 steps at 210
- 7 steps at 300

---

**Equilateral Triangle**

- 6 steps at 360
- 8 steps at 90
- 10 steps at 230

---

**Square**

- 10 steps at 90
- 10 steps at 180
- 10 steps at 270
- 10 steps at 360

---

**Right Triangle**

- 10 steps at 30
- 10 steps at 150
- 10 steps at 270
Using a Compass

Pointing

North—Did you know the earth’s core consists of a fluid outer core and a solid inner core? Because the outer core contains iron, when it flows it generates a magnetic field. This causes a compass needle, which is a piece of magnetized steel, to line up in the direction of the Earth’s magnetic field which is Magnetic North.

Holding a Compass—The best way to hold a compass is to hold your elbows against your sides at your waist. Cross your hands in front of you, palms up, in a straight line with your belly button. Place your compass on top of your hands with the direction of travel arrow pointing away from you. When you orient the compass, turn your whole body—not just your hands or the compass.

Taking a Bearing

To take a bearing, turn the compass housing until your desired direction is lined up with the Index Line (and also the direction of travel arrow). Holding the compass correctly, turn your body until the red end of the magnetic needle is aligned with your orienting arrow. You are now facing your desired direction.

Walking a Bearing

To walk a bearing, look straight ahead (the farther the better) and choose a landmark or a spot which is in the direction the direction of travel arrow is pointing. Walk to that landmark or spot without looking at the compass.
WHERE AM I?

This is not a question you want to be asking yourself as you are going down the ski trail. With enjoying the outdoors comes the possibility of getting lost. In this section you will learn to use a map and compass. Maps allow you to determine your location and route planning. The compass allows you to follow your bearings you take on the map.

How many different features can you identify on the map by matching the topographic symbols to the corresponding topographic map. Complete the map & compass activity described in Making Tracks for this section on the next page Good Luck!
MAKING TRACKS

Share the Experience

- What was the most fun and challenging about doing this activity?
- How successful were you combining a map and a compass?

Reflections

- Why is it important to be able to use a map and a compass?
- Besides cross-country skiing, where else might people use a map and a compass together?

Now What?

- How could you use your knowledge of map and compass on a ski trip?

Using a Map and Compass

Obtain a topographic map of an area in your community that is used for Cross-Country Skiing. Head over to this area to learn how to orient your map, set a route, and how to use triangulation to find your location.

1. **Orienting the Map.** Begin by turning your map so that the terrain features line up with the features on your topographic map. This is known as orienting the map. To orient the map to true north, place it on a flat surface, set your compass direction of travel arrow on N, and place the compass parallel to one of the side margins of your map, hold the map and compass steady and rotate both until the magnetic needle lines up inside the orienting arrow of your compass.

2. **Finding North** Look at the bottom of your topographic map. If the Magnetic North (MN) arrow on the map magnetic north declination diagram is to the right of the true north line, subtract the MN value. If the arrow is to the left of the line, add the value. Then, standing on your location on the ground, set the compass so that “zero degrees or North” aligns with the magnetic north needle, read the magnetic bearing that you have determined by this procedure, and head off in the direction of this bearing to reach your destination.

3. **Following a Bearing** If you can see a location you would like to travel to, take a compass bearing to it and then follow this bearing. Even if you can see your desired location when you start, there may be objects that may block your sight later or the weather may change to where objects are no longer visible.

**Words**

- Contour Line
- Magnetic North
- Orienting Arrow
- Orienting Lines
- Scale
- Topographic Map
- Triangulation
- True North
WHO MADE THOSE TRACKS?

Winter adventures provide a great opportunity to learn about the movements of wildlife through observation of tracks left by birds and wildlife.

Deer are toe walkers, and hind prints are often placed on top of the front prints. Some deer will drag their feet as they walk leaving scuff marks; very visible in the snow.

Elk The track of an elk is larger and more rounded than that of a deer and smaller than the tracks of a moose.

Black Bear They “should” be hibernating in the winter months but you never know. They are slightly pigeon-toed and the hind prints tend to overlap the front prints.

Grizzly Bear tracks are characterized by an oval pad with five toes along the wider top of the pad on the hind feet. The front feet have a smaller heel pad and a dew claw which may be present in the print. Claw marks over twice as long as the toe pads are usually evident.

Moose tracks are slightly larger and more pointed than that of the elk and similar in shape to a deer’s but twice as large. The track may be blunted if the ground is rocky and hard, making it more difficult to distinguish from the elk’s. A typical print is of two pointed pear shapes with the tips closer than the wider bottom.

Raccoon tracks are paired, having one rear foot beside one front one. The raccoon has five toes and usually the claw marks are evident in the print. The hind foot makes a print in which the toes and heel pad are joined whereas the front tracks toe and heel pad have a brief space between. The print vaguely resembles that of a miniature bear.

Tracks can give us much information about the presence, abundance, and habitat preferences of specific birds and animals. Keep your eyes and ears open as you explore the outdoors.
**Coyote** The tracks closely resembles that of a dog or fox although the coyote tends to follow a straight path across open areas where the others will wander or follow aspects of the landscape. The print is a rough oval shape with four toes bearing claw prints. The larger front foot has a much larger pad than the smaller rear foot.

**Deer Mice** The two sets of tracks below show the five toes of the hind foot. Front feet have four. The tail sometimes drags in the trail, leaving a mark like the one in the photo to the right.

**Cougar** tracks rarely show evidence of the claw. The front feet are larger than the rear and generally the toes spread wider with speed. A distinctive feature of this creature in snowy areas is tail marks on the snow and they walk in a straight line.

**Red Squirrel** tracks are common between trees and near holes in the ground where they have dug up buried cones. Squirrels place their feet next to each other rather than one in front of the other. In deep snow their tracks are characterized by two diamond shapes next to one another. A clear imprint will reveal five long toes with claws similar to the skeleton of a human hand and may or may not have a heel print. The heel is as long again as the toes and a rough oval shape.

**Skunks** leave a distinct pattern which is easily identified. The smaller front feet are pigeon-toed and placed just ahead of the larger rear feet while in motion. This five-toed creature has long claws which are usually evident in the prints.

**Bobcat** tracks are distinguished with a round shape, four toes and no claws evident. It is generally twice the size of a domestic cat's print and loosely resembles that of a coyote or dog but is more rounded. At greater speeds the toes of the front foot spread easier than that of the hind one which has a smaller ball pad.

**Deer Mice** The two sets of tracks below show the five toes of the hind foot. Front feet have four. The tail sometimes drags in the trail, leaving a mark like the one in the photo to the right.

**Cougar** tracks rarely show evidence of the claw. The front feet are larger than the rear and generally the toes spread wider with speed. A distinctive feature of this creature in snowy areas is tail marks on the snow and they walk in a straight line.

**Red Squirrel** tracks are common between trees and near holes in the ground where they have dug up buried cones. Squirrels place their feet next to each other rather than one in front of the other. In deep snow their tracks are characterized by two diamond shapes next to one another. A clear imprint will reveal five long toes with claws similar to the skeleton of a human hand and may or may not have a heel print. The heel is as long again as the toes and a rough oval shape.

**Skunks** leave a distinct pattern which is easily identified. The smaller front feet are pigeon-toed and placed just ahead of the larger rear feet while in motion. This five-toed creature has long claws which are usually evident in the prints.

**Grey Wolf** This animal generally travels in packs. During the snowy winter months they tend to follow the trail made by the leader to conserve energy. The front foot is larger than the rear and the toes are often splayed particularly in soft ground. The front foot track is rounded with four toes with the claws evident and the heel pad having an inverted V-shape, whereas the rear is slightly more oval with a triangular shaped pad.
MAKING TRACKS

Share the Experience
- What did you observe on your adventures?
- What does “respect our natural environment” mean to you?

Reflections
- What did you learn about wildlife and the environment?

Keeping a Field Notebook
One of the joys of experiencing nature is recalling your experiences. What you see and learn on your trips can be recreated later in stories, presentations, writings, or just personal memories. Place your observations in a field notebook—bird songs, tracks of animals and birds, interesting plants, or whatever strikes your interest. The book is your personal record of what you see, hear, touch, small, and feel. Include sketches, paintings, and photos. Here are some other helpful hints for your notebook:
- Decorate the margins of your notebook with sketches of plants, birds, mammals, insects, and the traces of different animals.
- Don’t forget to include sketches of the sky, scenic vistas, and panoramas
- Dedicate a whole page to a single animal or plant that interests or fascinates you.

Now What?
- How can you help to preserve the environment?

Natural Resources
What are natural resources? What would you imagine a “natural resource” to be? Humans use natural resources such as; water, air, trees, oil, and minerals from rocks for a variety of things. In fact, just about everything that you use if from a natural resource. Can you think of the natural resources that you might have used just today?
GLOSSARY

Airway-When we breathe, air passes through our airways (the tubes that carry air into and out of the lungs) to get to our lungs.

Alpine Skiing-Alpine Skiing can be considered as the general Skiing sport and it is what most skiers practice. A novice skier making his way down his first groomed slopes can be called an Alpine Skier. It can be considered as the starting point of all non-cross-country Skiing Disciplines.

Antiseptic/Antibacterial—Destroys bacteria or inhibits its growth.

Avalanche—Is a condition when huge masses of snow slide down a slope. This is one of the major dangers during winter.

B

Bandage—Anything that goes over the top of a wound to secure a dressing.

Base Plate—Rectangular plate on which the compass housing is mounted.

Bearing—A direction of travel stated in compass degrees, relative to North.

Burns—an injury cause by exposure to heat or chemicals or radiation.

Binding—The hardware that connects a ski boot to the ski.

C

Camber—The “warp” in the ski. It also distributes weight evenly along the entire ski.

Cardinal Directions—The principle directions; North (N), South (S), East (E), and West (W).

Circulation—Movement through a circuit; especially the movement of blood through the heart and blood vessels.

Compass—Instrument for determining directions with the help of magnetized steel swinging on a pivot.

Conservation—the preservation and careful management of the environment and of natural resources.

Contact Points—The glide zones of the skis; namely the tip and tail of a ski.

Contour Line—On a topographic map, used to represent elevation (height above sea level). They key at the bottom of the map includes the scale for each contour line.

CPR (Cardiopulmonary Resuscitation)—an emergency procedure consisting of external cardiac massage and artificial respiration; the first treatment for a person who has collapsed and has no pulse and has stopped breathing; attempts to restore circulation of the blood and prevent death or brain damage due to lack of oxygen.

Cross Country Skiing—Skiing groomed trail over varied terrain with light weight ski equipment. Boots are held onto the ski by a binding system which secures the boot at the front and along the length of the boot but allows the heel to freely move up off the ski.

Dehydration—Large fluid loss from the body.

Direction of Travel Arrow—Arrow printed on the base plate on the outside of the compass housing. When the compass is oriented properly, this arrow points in the direction you travel.

Dressing—The material that directly covers a wound, usually gauze.

Etiquette—The right things to do in relation to proper trail behavior.

Exhaustion—Serious weakening and loss of energy.

Expiration—Date at which products may no longer work or be safe to use.

Exposure—The harmful effects of cold or other extreme weather.

First Aid—Emergency treatment administered to injured or sick persons before professional medical care is available.

Frostbite—destruction of tissue by freezing and characterized by tingling, blistering and possibly gangrene.

G

Groomed—Result of mechanically working the snow to produce a more consistent skiing surface.

H

Hypothermia—Subnormal body temperature.
### Additional Meeting Ideas

Are you looking for more outdoor adventure project meeting ideas? Here is a list of possibilities. Brainstorm more ideas with the participants in your group.

- Packing a Lunch and Nutritious Snacks
- Identifying Parts of a compass
- Purifying Water
- Shelters
- Protection from weather conditions
- What to do if you get lost
- Preventing Hypothermia
- Preventing Exhaustion
- Performing CPR
- Obtaining Medical Assistance
- How to treat injuries
- Knot Tying
- Identifying Map Terrain
- Identifying Topographic Symbols
- Setting up an Orienteering Course

### GLOSSARY

<table>
<thead>
<tr>
<th>S</th>
<th>Ski Pole-Tools that aid in maintaining balance. Can be used to increase speed. Ski Pole Basket-The round, usually flat, disk located a couple of inches on top of the Ski Pole Tip. Baskets can be made of different materials, but most of the time, they are manufactured from durable plastic. Snow Blindness-is a painful condition caused by exposure of unprotected eyes to sunlight reflected from snow. This is especially a problem at high altitude and polar regions. Sprain - a painful injury to a joint caused by a sudden wrenching of its ligaments.</th>
</tr>
</thead>
<tbody>
<tr>
<td>T</td>
<td>Topographic Map-Illustrates the surface of the Earth by using contour lines and symbols to represent certain land features, landmarks, terrain, and water. Triangulation-The process of determining a location by taking intersecting bearings on two or more points. True North-The geographic or “true” North Pole at the geographic top of the earth. True North is indicated on maps.</td>
</tr>
<tr>
<td>W</td>
<td>Wool-A fabric made from the hair of sheep; the weave of the fabric allows wool to absorb perspiration and the fabric “breathes,” unlike polyester.</td>
</tr>
</tbody>
</table>

### RESOURCES

**Outdoor Adventures Youth Activity Guides**

1. Hiking Trails 4HCCS BU-08043
2. Camping Adventures 4HCCS BU-08044
3. Backpacking Expeditions 4HCCS BU-08045

*Introduction to Adventures: 4-H Adventure Project* by Ted May, 4-H 444, University of Wisconsin Extension 4-H Youth Development Programs

**Cross-Country Skiing**

*4-H Cross-Country Skiing* by Jim Pease

**First Aid**

*Field Guide to Wilderness Medicine*, Paul Auerbach, Howard Donner and Eric Weisee

*Wilderness 911: A Step-By-Step Guide for Medical Emergencies and Improvised Care in the Backcountry*, Eric A. Weiss


*Wilderness Medicine: Beyond First Aid* by Wm. Forgey, MD

*First Aid—The Essential Basics* Copyright © 2003-2004 MaxLife-style.net ® “Go Skiing like Max!”.

**Hiking and Navigation**

*Soft Paths*, NOLS

*Take a New Bearing* by Phyllis M. Ford

*The Basic Essentials of Map & Compass* by Cliff Jacobson

**Wilderness & Survival**

*NOLS Wilderness Guide*, Mark Harvey

*4-H Survival Project* assembled and prepared by Elayne Parrish, Edited by Charles M. Thomas, SU 1, University of Idaho Extension