

TRAINING MANUAL FOR MICHIGAN 4-H

OUTDOOR ADVENTURE CHALLENGE



Section: LEAVE NO TRACE AND WILDERNESS SKILLS



LEAVE NO TRACE AND WILDERNESS SKILLS SECTION CONTENTS

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LEAVE NO TRACE – PRINCIPLES OF OUTDOOR ETHICS

Plan Ahead and Prepare

- Know the regulations and special concerns for the area you will visit.
- Prepare for extreme weather, hazards, and emergencies.
- Schedule your trip to avoid times of high use.
- Visit in small groups. Split larger parties into smaller groups.
- Repackage food to minimize waste.
- Use a map and compass to eliminate the use of marking paint, rock cairns or flagging.

Travel and Camp on Durable Surfaces

- Durable surfaces include established trails and campsites, rock, gravel, dry grasses or snow.
- Protect riparian areas by camping at least 200 feet from lakes and streams.
- Good campsites are found, not made.
- Altering a site is not necessary.
- ***In popular areas***
 - Concentrate use on existing trails and campsites.
 - Walk single file in the middle of the trail, even when wet or muddy.

Minimize Campfire Impact

- Campfires can cause lasting impacts to the backcountry.
- Use a lightweight stove for cooking and enjoy a candle lantern for light.
- Where fires are permitted, use established fire rings, fire pans, or mound fires.
- Keep fires small. Only use sticks from the ground that can be broken by hand.
- Burn all wood and coals to ash, put out campfires completely, then scatter cool ashes.

Respect Wildlife

- Observe wildlife from a distance. Do not follow or approach them.
- Never feed animals. Feeding wildlife damages their health, alters natural behaviors, and exposes them to predators and other dangers.
- Protect wildlife and your food by storing rations and trash securely.
- Control pets at all times, or leave them at home.
- Avoid wildlife during sensitive times: mating, nesting, raising young, or winter.

Be Considerate of Other Visitors

- Respect other visitors and protect the quality of their experience.
- Be courteous. Yield to other users on the trail.
- Step to the downhill side of the trail when encountering pack stock.
- Take breaks and camp away from trails and other visitors.
- Let nature's sounds prevail. Avoid loud voices and noises.
- Keep campsites small. Focus activity areas where vegetation is absent.
- ***In pristine areas***
 - Disperse use to prevent the creation of campsites and trails.
 - Avoid places where impacts are just beginning.

Dispose of Waste Properly

- Pack it in, pack it out. Inspect your campsite and rest areas for trash or spilled foods.
- Pack out all trash, leftover food, and litter.
- Deposit solid human waste in catholes dug 6 to 8 inches deep at least 200 feet from water, camp, and trails. Cover and disguise the cathole when finished.
- Pack out toilet paper and hygiene products.
- To wash yourself or your dishes, carry water 200 feet away from streams or lakes and use small amounts of biodegradable soap. Scatter strained dishwater.

Leave What You Find

- Preserve the past: observe, but do not touch, cultural or historic structures and artifacts.
- Leave rocks, plants and other natural objects as you find them.
- Avoid introducing or transporting nonnative species.
- Do not build structures, furniture, or dig trenches.

WILDERNESS HYGIENE

- Follow Leave No Trace Ethics for disposal of human waste.
- Wash your hands often (including under fingernails) and especially at these times:
 - Before preparing, serving and eating food
 - After using the latrine
 - After touching contaminated items such as uncooked meats
 - After contact with animals, including pets
 - After swimming or contact with untreated water
 - Before treating blisters, abrasions, cuts
 - Before handling contact lenses.
- Soap and water are the best choice for hand washing, but if that is not available you can use an alcohol-based hand sanitizing gel. It works best if all the visible dirt has already been wiped off.
- At a base camp set up a *Hand Washing Station*.
 - This can be accomplished with two buckets, a bar of soap in a mesh bag, a modified water bottle and a towel.
 - One bucket should have a lid and contain potable water.
 - The other bucket should catch grey water.
 - The water bottle should have a hole poked in the lid and the bottom cut off with a string through it to hang.
 - Dip the bottle in the potable water, hang over grey water bucket and wash hands in the stream of water.
- Wash daily, if a water source is not nearby, use baby wipes.
- Continue to practice good daily hygiene such as teeth-brushing, flossing, use of deodorant.
- Be sure to purify water from natural sources before drinking. Be cautious not to cross contaminate water when filtering.
- When sharing food such as GORP, dump into hands rather than dipping your hand into the food bag.
- Don't neglect treating basic cuts, scratches and blisters. Basic wound care will help protect them from becoming infected and a much larger problem.
- Change socks and underwear daily.



- Choose biodegradable soap, such as Dr. Bronners, and keep it away from water sources.
- Bring unscented products such as deodorant, wipes and lotions.
- When it comes to menstrual products such as tampons and pads, treat it with the same "pack it in, pack it out" mentality as other waste. You may place an aspirin or black tea bag into the waste bag in order to reduce the scent. Be sure to hang this on a bear pole or put in bear vaults to keep animals away.
- Don't forget to use sunscreen, and make sure your lip balm contains some amount of SPF protection.

CLOTHING

Dress in Layers

Layering your clothing is a tried-and-true way to ensure your comfort in the outdoors. Each layer has a function. The **base layer** (against your skin) manages moisture; the **insulating layer** protects you from the cold; the **shell layer** (outer layer) shields you from wind and rain. You simply add or subtract layers as needed.

- For base layer seek out wool, synthetics such as polypropylene. This layer is usually very form fitting i.e. t-shirt, long sleeve t-shirt and/or long underwear.
- For insulating layer seek out wool, down, fleece, primaloft, or thinsulate. This is usually a vest, sweater, sweat shirt.
- For the shell layer seek out waterproof breathable jackets. Uninsulated for hiking and more active events and warmer weather. Use heavier, more parka type insulated jackets for cold weather activities.

Remember as you travel to assess and remove layers as needed. Generally speaking, it is better to start out thinking you are not dressed warm enough, than to overheat. Taking off layers before you sweat is important to keep dry and comfortable throughout the day, especially in cool/cold weather. This is another area where it is important to test your gear before you go. The more you use your clothing in varying weather and activities, the better you will be at choosing the right layers.

Avoid cotton clothing – it retains moisture and does not insulate well leaving your body unprotected from the elements and open to hypothermia. Cotton kills.

Wool socks or other synthetics can be layered with a non-cotton sock liner.

Other clothing type items that make travel and camping more comfortable include:

- Bandana
- Gaiters
- Gloves
- Mosquito net
- Sandals (in camp)
- Watershoes (closed-toe)
- Down booties
- Rain pants
- Sunglasses
- Hat (warm and/or baseball cap)

For more info on gear, including boots, sleeping bags/pads, stoves and more visit www.rei.com. They have an excellent "Expert Articles."

NUTRITION AND HYDRATION

Just like a car needs fuel to drive, the human body needs food and drink to build up the energy needed to participate in outdoor activities. The provisions you take with you will largely depend on your own preferences, the duration of the trip, and if you will be able to replenish your supplies along the way. In general, good planning and precautions can prevent serious nutrition problems.

Selecting your Foods

Selecting what food to take with you will depend on your plans. On short trips, you can pamper yourself by taking all kinds of snacks. However, if you are going on multi-day hikes with no sure places to replenish your provisions, careful choices will have to be made to make sure you can pack the necessary provisions.

Here are some tips when it comes to selecting your foods:

- Dried or dehydrated foods: retain most of their nutritional value but since most of the water content has been removed, the foods are lighter in weight and smaller in volume. Preparation is mostly very simple but will require water.
- Canned/Pouched Foods: are even easier to prepare but are both heavier and take up more space.
- Select a variation of foods that fulfill different nutritional needs. Variation in your food intake is very important especially on longer trips.
- Choose foods you will eat. There is no reason to carry along something you like very little or have never tried and find out you don't like.
- When car camping vs. back country camping you do not have to limit your choices as much.

Plan your Meals

You need to plan your food and fluid intake to make sure that you have enough to last for the duration of your trip. Planning your meals will make sure that you do not over indulge on day one, leaving you with nothing to eat on the third day. Here are some guidelines in planning your meals:

- Do not depend on other possible sources of food and bring everything you need to keep yourself well-fed during your hikes. Only if you are 100% sure that you will be able to restock should you take less with you.
- If you are sure about re-supply points in your trip plan then anticipate on what provisions they can replenish.
- Repackage food as to not haul out extra trash.
- Avoid cans and glass containers – especially when backcountry camping.
- Separate your meals in daily rations and package them separately. This will make it easier to determine how much you are allowed to eat to have enough for the full duration of your hike.
- Package and label emergency rations. Labeling them as emergency rations will make you think twice before you use them as a snack!

Plan your Water Needs

Under normal conditions, the human body will be able to go without food for days. Without water, however, problems come a lot quicker. Here are some guidelines in planning your water needs:

- The absolute minimum is at least two liters per day. Take at least two liters with you even if you expect to find places where you can refill your water reserves.
- Take about one liter for every two hours of hiking with the abovementioned two-liter minimum.
- Under normal activity conditions, three to four liters per day should suffice.
- Higher temperatures will increase the needed fluid intake.
- Increased exercise will increase the needed fluid intake.
- If you plan to spend nights outdoors while hiking, calculate extra water reserves for washing yourself and possibly rinsing cooking utensils.
- Make sure to bring water purification filters, pills or devices even if you are bringing sufficient fluids for the trip. Water bottles and bladders can burst, leaving you with nothing. In these cases, water filters and purifiers can make the difference. If you have nothing to filter the water with but you do have your cooking gear then you can make most outdoor water potable by boiling it for at least 10 minutes.

Consideration with Groups

- Community meals
 - Share the burden of packing food in, preparing and clean up.
 - Forces everyone to get together at one time to eat.
 - Easy to monitor if all participants are eating.
 - Requires planning ahead of time and coordination.
- Solo meals
 - Participant is responsible for bringing, packing food in and preparation.
 - Everyone can eat when they feel like it.
 - More difficult to monitor if participants are eating.

Stop every hour when hiking, canoeing, etc... to rest and remind participants to have a snack and a drink. Ensure that leaders are monitoring everyone to notice if someone isn't properly hydrating or eating enough.

Easily Packable Foods

- | | | |
|---------------------------|--------------------|---------------------------|
| • Hard cheese | • Pasta | • Dehydrated meals |
| • Hard salami | • Rice | • Hot chocolate |
| • Jerky | • Dried potatoes | • Tea/coffee |
| • Peanut butter | • Jam/honey | • Single serving powders: |
| • Trail mix | • Granola | ○ Crystal light |
| • Nuts | • Granola bars | ○ Kool-aid |
| • Pouches of tuna/chicken | • Ramen noodles | ○ Gatorade |
| • Crackers | • Fruit leathers | |
| • Instant oatmeal | • Instant soups | |
| • Cereal | • Dried fruits | |
| | • Dried vegetables | |

MAP & COMPASS

Basics of Map Reading:

- Latitude and Longitude
 - Latitude lines run east and west
 - Longitude lines run north and south
 - Both Latitude and Longitude lines are measured in degrees
 - By finding the X axis and Y axis of latitude and longitude you can pinpoint a location
- Scale
 - All maps will list their scales in the margin or legend.
 - Most USGS maps are either 1:24,000 or 1:62,000
- Contour Lines
 - Contour lines depict the 3-dimensional character of the terrain, usually found on a topographical map
 - The closer the contour lines are the steeper the slope and vice versa.
 - Valleys are contours forming a V-shape pointing up the hill
 - Ridges are contour forming a V-shape pointing up the hill
 - Summits are where the contours form circles

Basics of Compass Reading

- Compass Parts
 - Base plate
 - Straight edge and ruler
 - Direction of travel arrow
 - Compass housing with 360 degree markings
 - North label
 - Index line
 - Magnetic needle (north end is red)
- Reading the Compass
 - Hold in your palm of your hand, flat, so the direction of travel arrow is pointing straight away from you.
 - Hold it just in front of your body, about waist level.
 - Dial the compass so that the North bearing is aligned with the direction of travel arrow.
 - Turn your body while keeping the compass in front of you, until the North arrow is straight in front of you. This should align the North arrow of the magnetic needle with the orienting needle also know as, "Putting Red in the Shed."
- Take a Bearing
 - Move your body toward an object hear by. Turn the compass dial to put red in the shed.
 - The number aligned with your direction of travel arrow is your bearing.
- Follow a Bearing
 - Turn your dial so that the bearing numbers is aligned with your direction of travel arrow.
 - Turn your body so that the north arrow lines up with the orienting arrow.
 - The direction of travel arrow is now aligned with where you need to travel.
 - Pick a landmark on the horizon that is aligned with your direction of travel arrow. This mark should be about 30 feet or so way.
 - Move to the mark and take another reading.
 - Alternately, you can or have someone walk ahead and stand where you need to go and when the person is in the correct stop, they stop and you move toward them.



ORIENTEERING ACTIVITY

School Yard Compass Game/Outdoor Practice

Purpose: Practice in setting the compass for degree bearings and following them with precision.
(Designed by Allen Foster)

Group Project: The course for this game can be set up in a schoolyard, in a park, or in a camp. The course consists of eight marked stakes set up in a large circle. The stakes are marked I, O, U, L, Z, E, A, and P. For laying out the course you also need an unmarked center stake, a string or rope 50 feet long or longer, and an Orienteering compass. An alternative to using stakes is to use bright-colored spray paint. This prevents participants from fixating on the stakes.

To lay out the course, place the unmarked stake in the center of the area you have chosen for the game. Attach the measuring string (rope) to the center stake. Starting at the center stake each time, set the compass bearing as indicated below for each lettered stake; stretch out the measuring string (rope) along

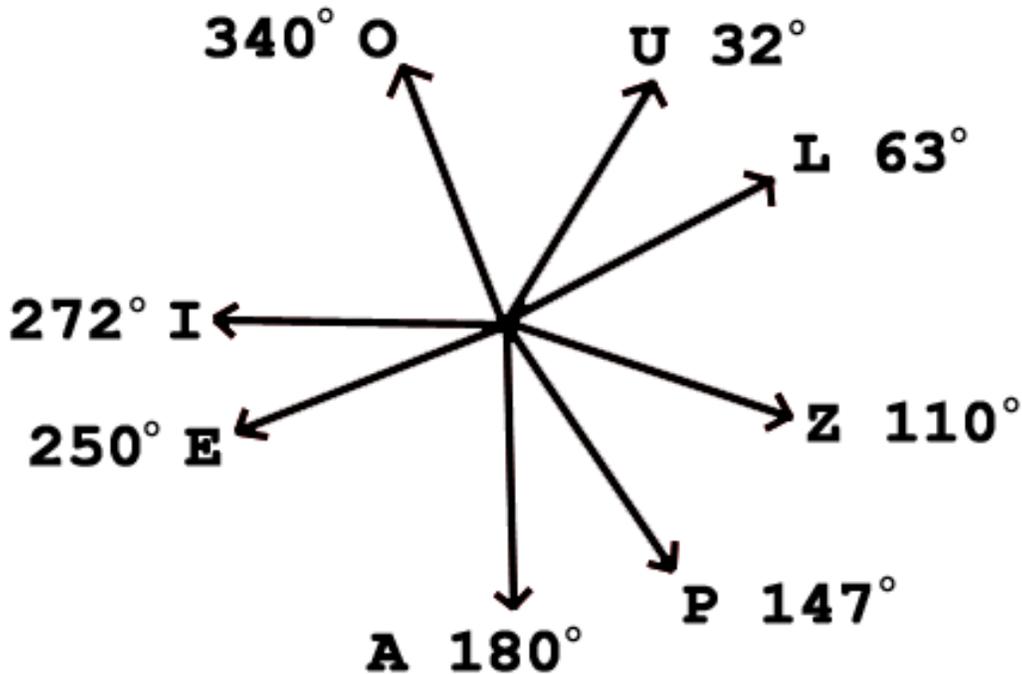
this bearing and place the respective marked stake at the end of the string (rope). The success of the game depends on the careful positioning of the marked stakes.

U – 32°
L – 63°

Z – 110°
P – 147°

A – 180°
E – 250°

I – 272°
O – 340°



To play the game each participant or group is provided with an Orienteering compass, a pencil, and an instruction card. The card tells him at what marked stake to start and directs him to follow five compass bearings from marker to marker around the course. The player copies down on his card the letter on each marker along his route.

Schoolyard Compass Game Answers:

- Course #1 EOUZP
- Course #2 IULPA
- Course #3 OLZAE
- Course #4 UZPEI
- Course #5 LPAIO
- Course #6 ZAEOU
- Course #7 PEIUL
- Course #8 AIOLZ
- Course #9 IUZAE
- Course #10 OLPEI

Course #1

Start at stake or point marked A

- Proceed at 305°. Marker reached _____
- Proceed at 25°. Marker reached _____
- Proceed at 96°. Marker reached _____
- Proceed at 161°. Marker reached _____
- Proceed at 219°. Marker reached _____

Course #2

Start at stake or point marked E

- Proceed at 351°. Marker reached _____
- Proceed at 68°. Marker reached _____
- Proceed at 138°. Marker reached _____
- Proceed at 195°. Marker reached _____
- Proceed at 254°. Marker reached _____

Course #3

Start at stake or point marked I

- Proceed at 36°. Marker reached _____
- Proceed at 112°. Marker reached _____
- Proceed at 177°. Marker reached _____
- Proceed at 235°. Marker reached _____
- Proceed at 305°. Marker reached _____

Course #4

Start at stake or point marked O

- Proceed at 96°. Marker reached _____
- Proceed at 161°. Marker reached _____
- Proceed at 219°. Marker reached _____
- Proceed at 289°. Marker reached _____
- Proceed at 351°. Marker reached _____

Course #5

Start at stake or point marked U

- Proceed at 138°. Marker reached _____
- Proceed at 195°. Marker reached _____
- Proceed at 254°. Marker reached _____
- Proceed at 316°. Marker reached _____
- Proceed at 36°. Marker reached _____

Course #6

Start at stake or point marked L

- Proceed at 177°. Marker reached _____
- Proceed at 235°. Marker reached _____
- Proceed at 305°. Marker reached _____
- Proceed at 25°. Marker reached _____
- Proceed at 96°. Marker reached _____

Course #7

Start at stake or point marked Z

Proceed at 219°. Marker reached _____
Proceed at 289°. Marker reached _____
Proceed at 351°. Marker reached _____
Proceed at 62°. Marker reached _____
Proceed at 138°. Marker reached _____

Course #8

Start at stake or point marked P

Proceed at 254°. Marker reached _____
Proceed at 316°. Marker reached _____
Proceed at 36°. Marker reached _____
Proceed at 112°. Marker reached _____
Proceed at 177°. Marker reached _____

Course #9

Start at stake or point marked A

Proceed at 320°. Marker reached _____
Proceed at 62°. Marker reached _____
Proceed at 161°. Marker reached _____
Proceed at 235°. Marker reached _____
Proceed at 305°. Marker reached _____

Course #10

Start at stake or point marked E

Proceed at 29°. Marker reached _____
Proceed at 112°. Marker reached _____
Proceed at 195°. Marker reached _____
Proceed at 289°. Marker reached _____
Proceed at 351°. Marker reached _____

To Make Additional Instruction Cards

Pick any combination of 6 letters from the list: A, E, I, O, U, L, Z, P. The first letter is the marked stake that the participant will start at, the next five letters will be the answers.

Do not pick the same letter consecutively, example: Z, A, A, P, E, L. Because the participant would not move. But it is possible for the same letter to be used, example: Z, A, P, E, A, L. With a small group more than 6 letters could be picked, the first letter is still the starting stake and the remaining letters are the answers.

Use the provided charts to determine the compass bearings from one marked stake to the next marked stake. Example, I picked the six letters: Z, A, P, E, A, L.

The participant will start at Z, use the chart, **From Z**, first to find the bearing to A, bearing is 235°.

To find the bearing from A to the next stake P, use the chart, **From A**, bearing to P is 74°.

Next use the chart, **From P**, to find the bearing to E, bearing is 289°.

Next use the chart, **From E**, to find the bearing to A, bearing is 125° .

Next use the chart, **From A**, to find the bearing to L, bearing is 32° .

Start at stake marked Z.

Proceed at 235° . Marker reached _____

Proceed at 74° . Marker reached _____

Proceed at 289° . Marker reached _____

Proceed at 125° . Marker reached _____

Proceed at 32° . Marker reached _____

Answer to the example: A, P, E, A, L (not on the instruction card)

Note: By picking 6 letters and using the provided charts, you can make over 16,000 additional sets of instructions.

SURVIVAL

Are You Prepared?

4-H Outdoor Adventure Challenge is a program that teaches youth many life skills. Along with team work, communication, and citizenship, they learn how to survive in difficult situations. Why is this important?

Each season an increasing number of people leave the relative security and familiarity of everyday surroundings and enter the woods in search of recreation. Each season, the number of people who find a wilderness emergency, increases.

4-H Outdoor Adventure Challenge gives advice that can most likely save your life in an outdoor emergency; it is the single realization that *SURVIVAL IS AN ATTITUDE!* The ability to maintain calm in the face of outdoor danger can do more to preserve your life than all the neat little tricks of making fire by friction or getting food by improvising traps and snares.

Survival stresses are many. There are body stresses from thirst, hunger, disease and injury; mental stresses from loneliness, solitude, isolation, fear, imagination; environmental stresses from cold, dryness, heat, wind, humidity. Often these all work together against a person who's unprepared for any of them. A firm, solid attitude about yourself and your situation may be the only tool you've got to conquer these stresses.

Rules for Survival

1. **THINK IT THROUGH:** Thinking through what may happen helps you develop the mental set or reinforcement necessary to face survival stresses.
2. **DON'T GO ALONE:** Going alone raises the danger level seriously. Even minor difficulties for the lone hiker, backpacker or camper can be serious. Ideally, there should be at least three people in a hiking party. Then, if an emergency develops one can go for help, while the other stays to assist the injured.
3. **LEAVE A TRAVEL PLAN—STICK TO IT:** It is very difficult to search for a lost hunter when all that is known is that he is "up north". Be sure that at least one person who has some personal stake in your future has a detailed plan of your route and an estimated time of return.
4. **DRESS FOR OR CARRY EXTRA CLOTHING:** To dress for warm weather based on present conditions and prepare for nothing else is to court disaster. This is especially true in spring and fall. Death by hypothermia can and does happen at temperatures as high as the 40's.

5. **CARRY BASIC SURVIVAL EQUIPMENT:** A strong knife, matches, and whistle represent the barest of essentials. A compass, map, flashlight and small first-aid kit can also be important. The whistle is for signaling. Three blasts is a distress signal which can be repeated over and over and will not cause laryngitis.
6. **LOOK BEHIND YOU:** Most people only look toward the area they are approaching, forgetting that when they turn around to go back, things will look entirely different.
7. **PREPARE YOURSELF PHYSICALLY:** Go on short, shakedown walks and hikes before any major field trip, starting with no pack and finally including the pack with the weight you intend to carry on the trip.
8. **KNOW AND ABIDE BY YOUR PHYSICAL LIMITATIONS:** Watch out for stress related problems. Experienced outdoors people usually plan a pace they know they can maintain all day.

Six Keys to Survival

Besides the proper attitude, you will need six other things if you are to survive. How badly you need them and in what order depends entirely on your particular situation.

1. **ENERGY** Conserve energy
2. **FIRE** One of the first items of business
3. **SHELTER** Something comfortable that protects you from the weather
4. **WATER** Purify by boiling or with tablets
5. **SIGNALS** Use contrast in shape, texture, color or noise
Three of almost anything is a distress signal
6. **FOOD** You can live 30 to 50 days without food

Rules for Outdoor Success

1. **Teach Realistic Understanding of the Outdoors**
Most animals pose no threat and the sounds of the woods can be enjoyable rather than frightening.
2. **Stay Calm**
Panic never accomplished a thing. Teach participants to function under stress. When they first realize that they're lost and can't get back on time, they should sit down and plan what to do.
3. **Generally, Don't Travel**
Remind youth the same thing parents told them about getting lost in a store. "Don't look for mommy and daddy. Stop where you are and stay there. We'll find you!" Travel is only likely to take them away from the area being searched.
4. **Never Go Alone**
Only hike or go on walks in the outdoors when leaders are along.
5. **Leave a Travel Plan**
Leaders must instill in their participants the importance of never doing *anything* without telling a leader.
6. **Dress Properly**
Be sure when everyone going into the outdoors that they have enough of the right kinds of clothing. Will participants be able to weather a night out alone? Are their clothes adequate? Teach them how to stuff clothing with milkweed down, cattail fuzz or dry leaves to increase insulation.
7. **Provide Them With Basic Equipment**
Encourage each participants to carry a possibilities bag and keep it with them at all times. It should contain: a whistle, compass, water, snack, matches/lighter/firestarter, flashlight, emergency blanket, small first aid kit (including any vital medications such as an epi pen), extra layer of clothing.
8. **Don't Horse Around**
Too many accidents in the outdoors have their roots in horseplay. In one camp area, a group of young people were chasing each other helter skelter through the site. Suddenly, one of them stumbled over the firewood stacked near a wood-fired stove, fell, and throwing both hands out to

stop the fall, put them down with a sizzle right on the glowing, red-hot top. Hide and seek games can result in disorientation and an unpleasant night out. Running can end with sprained or broken ankles or in high country, a fall over a cliff. It's just too hard to think and fool around.

9. **Know How to Find Shelter**

Teach children to crawl under windfalls, into hollow trees (after checking for other residents) or build simple lean-to's to minimize their exposure to rain, snow, and wind. Get a survival book and read it as a family project.

But...Remember, whether you are five or ninety-five—**Survival is an Attitude!!**

STAYING FOUND

Getting lost in the wilderness is easier than we think. Wander away from the group to use the bathroom in privacy, hunting mushrooms, examining wildflowers, and following a different trail than planned are just a couple ways we can get turned around in the wilderness. Luckily, there are several things you can do to prevent getting lost.

- Knowledge of map and compass (and GPS can be used with these) is the best way to stay found. Prepare yourself for the trip with maps and the proper supplies.
- Remain aware of your surroundings; take particular note of the condition of a trail and landmarks along the way. This includes turning around occasionally on the trail, especially when you are at a landmark, to see what the trail looks like when approached from the opposite direction. Anticipate conditions that may change the look of the trail; is it possible that fog or snow could arrive.
- Take your time and if you think you are off track, stop and reevaluate.
- Don't blindly follow the group. Speaking up and question direction of the group. Don't be afraid to ask the leader why she took a left instead of a right or vice versa.
- As the leader don't blindly lead the group. Stop and ask consult the other leaders. Do not let pride endanger the group.
- If you are separated from the group, stop moving. Many people use the S.T.O.P. method.
 - **Sit down:** Retrace your steps in your head. Don't panic. Use this time to hydrate and eat if you are hungry. Blow your whistle 3 times and listen for a response.
 - **Think:** Retrace your steps. Think about what supplies you have, your condition and the conditions around you.
 - **Plan:** Decide if it is best to plot a course with your map and compass or remain where you are and wait for the group to look for you. If you move on, don't be afraid to make your trail along the way. This way you can find the way back or others may find a way to you.
- Always leave your plans with someone at home. This way if you don't arrive back on time they have a general idea of where to look and when to send help.

SEARCH & RESCUE: A QUICK OVERVIEW OF SEARCH

Search and Rescue (S&R) is a specialized skill requiring significant training and experience. This overview is intended to help 4-H Outdoor Adventure Challenge leaders carry out early search activities and to understand the process of more extensive searches so that their efforts will facilitate the efforts of a search and rescue team. It is not intended to prepare leaders to undertake the full S & R operation on their own. Hopefully, the actions a leader would take in the first stages might locate the missing person quickly, before the mobilization of experts is needed. The sections of search procedures borrow from a presentation by Terry Dupra, Outdoor Adventure Challenge leader and member of Marquette County Search & Rescue.

Search

The emphasis here is on the search for lost/missing persons, not the rescue of a stranded or injured participant. Rescue of stranded or injured persons should be covered in your Outdoor Adventure Challenge First Aid training; many rescues need other specialized training and equipment.

The search process begins with the realization that the individual is missing from the group. As soon as a participant is reported missing:

Pre-Search

Pre-Search practices are initiated:

- Leader assumes role of search leader and appoints a scribe. Scribe writes down everything that is done and the time each event occurs.
- Stop all programming. Collect the group, Interview the one reporting the missing person.
- Establish a safe, secure base camp where you are, or as close as reasonably possible from the point the missing person was last seen, but away from likely areas where clues might be found. Set up a camp perimeter and look closely within that perimeter for any clues (footprints, dropped items, trail, etc.) before they are obliterated.
- Keep everyone inside its perimeter unless they have a task approved by the search leader. As appropriate, set up an overnight camp, or prepare for withdrawing the group from the field, or prepare for assisting (warming, feeding, etc) the found person.
- Search leader and scribe compile all available information about the missing person, recording it on a Missing Person Questionnaire.
- Manage youth by giving them tasks. Older/more experienced youth may be able to assist with the search. Give all the others tasks to do to keep busy, such as warming water, making a fire. Ideally, one adult in the group can be assigned to keep track of all the happenings of the base camp and those not participating in the search.

Quick Search

- Using available help, do a quick search of the immediate area, looking not just for the missing person, but also for signs of their passage. Immediate area might mean within sight of the base camp. If whistles are used to signal, use single blasts and wait and listen for the lost person to signal three times in response.

Further Search Practices

If the person is not found by a quick search in the immediate area, initiate one of the following forms of search. The type will depend on available personnel, terrain, weather, time the person has been missing, club members are probably not able to effectively carry out anything more than a “hasty search”.

- **Hasty search:** rapid search of the most likely places a person might go, such as trails, shelters, next planned spots for breaks or overnights, river banks, stream valleys, power lines, etc. Search any landmarks you have discussed with the group as places to go toward if you are lost.
- **Perimeter search:** detail search in which the area is covered by a line of searchers who search while remaining calling distance from one another. Searchers are briefed on boundaries of the search area and the search pattern to be used.
- **Fine search:** similar to perimeter search but searchers are close enough to one another that the missing person would not be missed even if they were unconscious.

The following apply to any search efforts:

- Search areas and routes should be marked on a master map of the area, kept by the scribe and/or search leader. Record any clues on the master map.

- Search procedures should be undertaken by teams of four (allows two to stay with an injured found person while two summon help) to eight people, each team with designated leader, maps, first aid kit, emergency pack, prearranged signals and procedures to follow if the missing person is found, and a prearranged reporting time.

Summon Assistance

- If the group cannot carry out a search procedure, (too small, too upset, too few adults to split group) or if the early search efforts have not located the missing person, or if the person is not found in a programmatically pre-determined time, outside assistance will be needed. The State 4-H Outdoor Adventure Challenge Coordinator should be notified at this time.

Leaving the Field

- Depending on location and number of leaders/adults present, merely getting to a phone to contact others may necessitate pulling the entire group from the field; club members should never be left unsupervised. If leaving the field, mark the location of your search camp in some way, and leave an easy-to-find note to the missing person in a visible place so they know to stay and wait.
- You may also leave the field at some point after assistance arrives and you have given them the relevant information. They may want little involvement from you, in fact.

After Local Authorities Have Taken Over

- Cooperate fully with authorities. Keep copies of all information you give authorities. As soon as possible, get away from distractions and write or tape record an account of everything that happened and that led up to it. Compare this with your copies of information given to authorities to see if any was not passed along to them.
- Keep in touch with the rest of your group; they will need attention from you.
- Summon help from home as needed.
- Do not make statements to press or media.

Person Found

- Use first aid and evacuation procedures and/or summon help if needed.
- Interview found person and complete the missing person report.
- Debrief club members and review entire operation. Some physical and emotional response is to be expected, if it has not surfaced yet.
- Notify anyone involved or responsible of outcome: local authorities, people whose phone you used, emergency contact person (who notifies anyone they contacted).
- State Outdoor Adventure Challenge Coordinator, etc.

Person Remains Missing

- Determine at what point you and club members will return home, and what support is needed there.
- Debrief club members and review entire operation. Some physical and emotional response is to be expected, if it has not surfaced yet.
- Notify appropriate persons; local authorities, emergency contact person (who notifies anyone they contacted), State Outdoor Adventure Challenge Coordinator, etc.

Special Topics: Runaways

- If the missing person is suspected to have run away, ask group members, Usually someone will know when a participant has run away, but do not assume this, or the other participants will share this information.
- Follow the same general practices as for a lost person.

- Runaways may try to avoid the searchers.
- Notify local authorities for help.

Preventing Person from Going Missing

Be clear with group as to expectations-how far they may go apart from the group, who they tell when going out alone (buddy, leader), what they tell (where they are going, as specifically as possible; when they will be back; what they are doing) and if they are taking emergency items with them (whistle, matches, compass, map, as appropriate).

Preventing Groups of Persons from Going Missing

If the group is separating into smaller groups, be clear as to where and when to meet again and whether these are firm meets (i.e. “Don’t proceed from here without the others”) or casual (i.e. “See you there if it works out that way, otherwise, we’ll see you firm at X place and time”) Discuss each group’s intended routes and alternate routes, and their likely actions in case of a problem or emergency.

Review with all participants what to do if they are lost. Do you expect them to day put, or take a “bail-out” route? Review signs for them to give (three whistles, fire, etc.) and for them to look/listen for (single whistles, fires, etc). Discuss signals to aerial searchers (day and night).

Determine (flip a coin, whatever) who is to look for whom if there might be confusion as to who is truly lost, as in unfamiliar, chocked terrain with few landmarks).

Review survival thinking. A “pull-through” attitude is extremely valuable in a difficult situation.

EXPEDITION BEHAVIOR

Expedition behavior, referred to as EB by outdoor leaders, is a term used to describe all the interpersonal relationships and interactions on an outdoor program. It is something all group leaders need to be aware of and make sure their groups are all on the same page. It cannot be overstated that the best way to guide a group toward working well together is to establish some type of expedition behavior principles early on.

You might use the following list as a starting point in discussions with your participants. These principles are focused on interactions within the group. Realize good EB also extends to interactions with other groups you encounter, to land managers, and to the land itself through dedication to Leave No Trace principles.

Ten Principles of Good Expedition Behavior

1. **Self-Awareness:** You need to be aware of your own needs, physical and mental state, and the effect you have on the rest of the group. Be aware of who you are and do not act in a manner that you are uncomfortable with or does not fit your personality.
2. **Self-Leadership:** To be an integral part of a group, you must take care of yourself and not impose avoidable demands on the group. Self-awareness is about identifying needs, while self-leadership means you take the initiative to address them. Eating regularly, keeping yourself hydrated with water you treat properly, preventing blisters, using sunscreen, and keeping your gear organized so you don’t hold up the group are examples of self-leadership.
3. **Selflessness:** Ask not what your group can do for you—ask what you can do for your group.
4. **Commitment:** EB is just a backcountry name for “teamwork,” and like a sports team the wilderness expedition functions best when there is commitment to common goals. Groups need to agree to these goals and work together to be sure they are met.
5. **Tolerance:** You don’t have to be lifelong friends with everyone in the group, but you do need to accept them for who they are. Work to not take offense easily.

6. **Consideration:** Be polite and avoid testing the tolerance of others. Respect the time and personal space of others.
7. **Trust:** Be relatively confident that the others will successfully fulfill any specific roles they are given and that they will practice good EB. Trust means making yourself vulnerable because benefit or harm is in the hands of another.
8. **Communication:** One of the basic tools that makes good EB possible is open and honest communication. Always consider what information you have and what would be useful to others.
9. **Humility:** Even if you're a great and famous outdoor leader, approach all situations and individuals knowing that you may still be able to learn. Learn to rely not only on yourself, but also on others in the group, especially turning to those with more skill in certain areas that you have.
10. **Sense of Humor:** Have fun and be playful! Even in the worst of circumstances an active sense of humor can be invaluable in lifting the spirits of the group.

“Good EB is about straightening out the tent’s guidelines at night, saving the last tea bag for someone else, making hot drinks before the rest of the group emerges from their tents, or figuring out which way to go but then letting someone else do it for themselves.”

Poor Expedition Behavior

An Individual’s basic needs, food, water, shelter, sleep, and a sense of security—provide a psychological and physiological foundation for good EB. Participants, use to having these needs met, may have a very difficult time coping if they are deprived, even for a short time.

Deprivation of basic needs leads to decreased mental function and irritability, both of which lead to friction among group members. Potential sources of frustrations that can lead to friction include:

- Lack of agreement on shared goals
- Different attitudes and expectation
- Varied skill and energy levels
- Unequal tolerance for risk and adversity
- Anxiety about ability to perform required skills.
- Individual behavior patterns
- Apprehension about the future
- Feeling of dependence on the leader and others
- Nervousness about being in a new environment

Information on Expedition Behavior taken from: *AMC Guide to Outdoor Leadership* by Alex Kosseff and is published by the Appalachian Mountain Club

HYPOTHERMIA

This occurs when the cold challenge of wind, cold, and wetness overwhelms the body’s ability to produce and retain heat. Onset can be:

- Acute (minutes-hours) as in cold water exposure
- Sub-acute (hours-days) as in outdoor activities
- Chronic exposure over days-weeks for the very young, the old, the ill and extended expeditions.

All of these types can be mild, moderate or severe. General hypothermia treatment includes: minimize/reverse the cold challenge; increase heat production (exercise); and maximize heat retention (insulation).

Prevention: adequate hydration and food intake; appropriate clothing and weather awareness essential.

Mild Hypothermia (generally above 90° F)

Evaluation

- Mental status changes – lethargic, irritable, withdrawn
- Shivering (usually uncontrolled)
- Loss of fine motor coordination
- Shell > core shunt

Treatment

- Increase calories and hydration
- General treatment above
- Increase heat production (exercise/shivering)
- Increase heat retention (insulate)
- Possible evacuation

Moderate/Severe Hypothermia (generally below 90° F)

Evaluation

- Severe mental status change, decrease AVPU (awake, verbal, pain, unresponsiveness)
- No shivering
- Pulse and respirations may be difficult to detect

Treatment

- Handle Gently to avoid ventricular fibrillation
- Keep flat
- Prevent heat loss
- Remove wet layers
- Use insulated hypo wrap*
- No aggressive shell rewarming (i.e. hot water immersion)
- Evacuate to controlled rewarming

***Burrito hypothermia wrap**

Layer ground up: Vapor barrier (tarp), Padding (sleep pad), Insulation (sleeping bag), 2nd Vapor barrier (trash bag), Patient, Insulation (sleeping bag)

Fold in ends over patient, tuck corners and wrap sides around patient.

HEAT-RELATED ILLNESS

Prevent by eating, replacing fluid losses and not overdoing it. These happen when the challenge of increase temperature, humidity and production of heat (from exertion and/or medication effects) overwhelm the body's ability to dissipate heat. This can cause heat exhaustion (radiator/fluid problem, and/or heat stroke (thermostat/temperature problem).

Until acclimatization occurs (up to 2 weeks), replacing water without sufficient amounts of salt from foods can increase the possibility of hyponatremia. Dehydration and extremes of temperatures can also alter the effects of medications.

Heat Exhaustion

Evaluation

Signs/symptoms of dehydration:

- Dizziness, nausea, headache, chills
- Elevated pulse & respirations
- Temp – normal or slightly elevated
- Skin – pale, cool, clammy
- AVPU – awake, fatigued, nausea, headache
- Low water & electrolyte intake
- evac to IV fluids if severe

Treatment

- Stop exercise
- Rehydrate slowly
- Replace electrolytes
- Rest in cool environment
- If able to drink, eat w/o vomiting, evac may not be necessary
- May require

Heat Stroke (>105° F)

Evaluation

- Severely altered mental status followed by decreased AVPU
- Seizures are common
- Skin – may be sweaty or dry

Treatment

- RADIP COOLING! Immerse in cool water or use evaporative cooling (wet victim and fan aggressively)
- ALS evacuation to IV fluids and meds if no improvement in mental status

Exertional Hyponatremia

Evaluation

- Slow thinking to less than A on AVPU or seizures
- Skin – normal to cool
- Temp – normal to slightly lower
- Usually near normal urine output
- Tremor

Treatment

- Electrolyte replacement: salty foods, electrolyte replacement drinks (dilute excessively sugared drinks)
- ALS if severe mental status/AVPU changes.
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