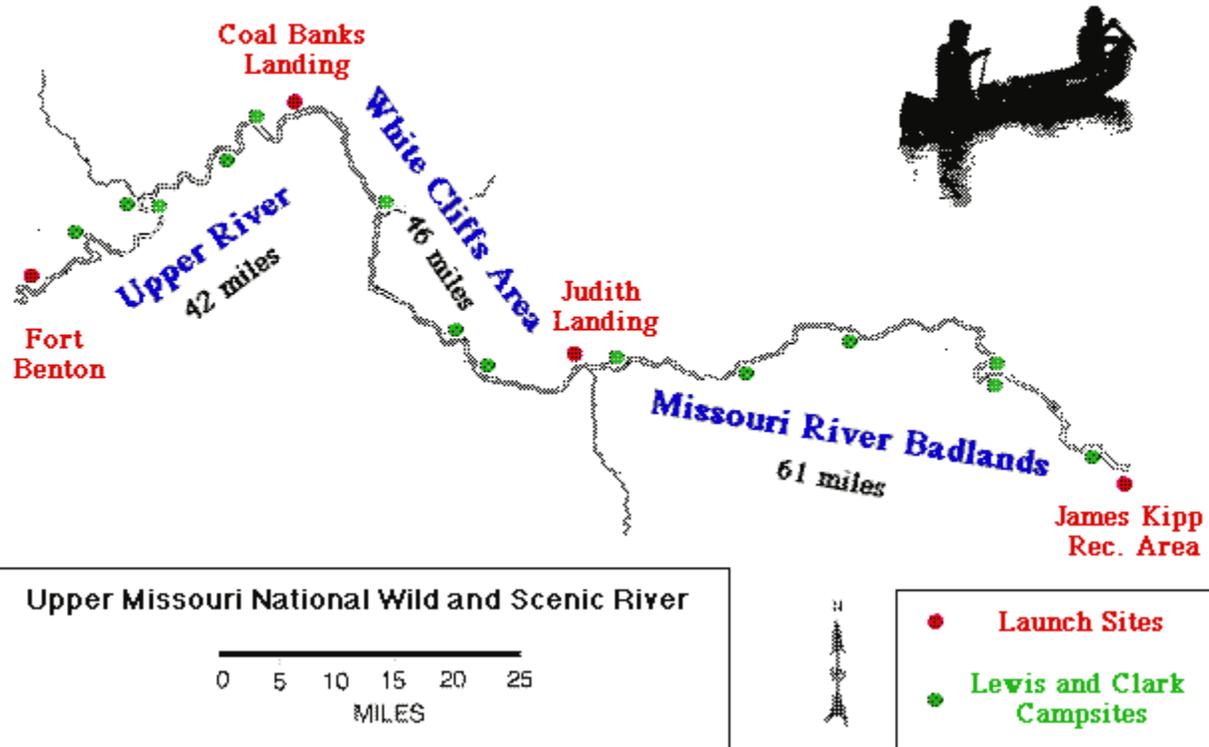


Lewis and Clark Upper Missouri River High Adventure Trip



Troop 344/9344
July 14-24, 2020

Troop 344/9344 River Rats



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An Introduction to the Upper Missouri River

Introduction

The Upper Missouri River winds its way through Montana. It begins at Fort Benton and ends at the James Kipp State Park, some 150 miles in length. Department of Interior. Unspoiled and rugged, the lands of the Upper Missouri River Breaks National Monument stretch across almost 380,000 acres in central Montana and contain a spectacular array of plants, animals, geology and history.

The Upper Missouri Region was first documented in 1805 by famed explorers Meriwether Lewis and William Clark. In his journal, Clark described the abundant wildlife of the area including mule deer, elk, bison and pronghorn. On April 29, 1805, the Lewis and Clark Expedition recorded the first big horn sheep observation by non-Indians in North America. Clark's description of the magnificent White Cliffs area on the western side of the monument was particularly poignant:

This 150-mile segment of Montana's Upper Missouri is an irreplaceable legacy of the historic American West and as such, it was designated a National Wild and Scenic River by Congress in 1976.

This river is full of beautiful tranquil scenery. The Upper Missouri River is broken down into three major sections. The first 40 miles is wide open valley land, the middle section, is the beautiful White Cliffs area described so vividly in Lewis & Clarks journals, and the third section is the Badlands area, of the Missouri Breaks. This last section contains much wildlife, including mountain sheep and elk. The average floater achieves 15-20 miles per day. Mileage is dependent on weather conditions and personal ability.

There are interesting side hikes and other historical sites to explore as well. Camping is very primitive, and once you leave Fort Benton, you will be floating through isolated land.

Safety Considerations

The Upper Missouri River has Class I rapids that are defined as easy, fast moving with riffles and small waves, few obstructions that are easily avoided, low risk and easy self-rescue. However, you should plan carefully to ensure a safe, enjoyable trip. As you think about the proper precautions to take on the water, also plan for safety on land to mitigate for rugged terrain, snakes, insects, and spiny plants.

Flotation Devices

Approved personal flotation devices are required for every boater. Participants must wear a life vest at all times while boating or swimming on the river.

Clothing and Gear

Tennis shoes, water sandals, or river shoes are desirable for wear in watercraft, but hiking boots will make exploring shoreline areas easier. Other necessities include a shade hat, long-sleeve shirt, long pants, rain gear, jacket, sunscreen, sunglasses, first-aid kit, and mosquito repellent. Quick dry, moisture wicking clothing materials are preferred; avoid cotton if you can. You might also want to consider a mosquito head net and a screen tent. Your gear should be stored in dry bags (or water-tight containers) to protect it from the elements and boating mishaps.

Exposure

Exposure to heat and the narrow river valley can cause a variety of heat illnesses. Drink plenty of water and take frequent breaks out of the sun. Ensure you are taking in adequate salts through food intake or an electrolyte mix. Though not as common, too much water can flush needed nutrients out of your system and cause illness.

Potable Water

The only potable water supply is at Coal Banks Landing (mile 41.5) and James Kipp Recreation Area (mile 149). We recommend that you bring adequate drinking and cooking water (one gallon per person per day). The water wells at Coal Banks Landing and James Kipp Recreation Area are tested monthly during the recreation season to ensure the water is suitable for drinking. Do not filter or boil water from the Missouri or its tributaries to use for cooking or consumption. There is agricultural runoff as well as cattle excrement that is not removable using aforementioned processes.

Human Waste Management

Portable toilet regulations are in effect for boaters on overnight trips from Fort Benton (mile 0) to the boundary of the Charles M. Russell National Wildlife Refuge (mile 138.8). The portable toilet must be an approved degradable bag system specifically designed for human waste disposal. All portable toilet waste must be carried out of the river corridor. Degradable waste bag systems may be disposed of in dumpsters at Coal Banks Landing, Judith Landing and James Kipp Recreation Area.

Plants

Poison ivy is common in the Breaks and surrounding areas. Take precautions while walking and setting up tents. Poison ivy can cause hives, rash and other complications.

Yucca plants are ubiquitous in the Breaks. Take care not to touch them with bare skin; the plant leaves are extremely sharp and contain saponins which are mild toxins that can irritate the skin and cause hives, irritation, and itching.

Prickly pear cactus are found in all areas of the Breaks and will inflict effects similar to those caused by a Yucca plant. The spines can stick in and break off in your skin.

Swimming

Swimming can be a great way to escape the heat during the summer months on the river, but you must have a companion and wear a personal flotation device. The river has deceptively strong currents with hidden rocks and snags below the surface.

Weather

Extremes in weather can be experienced while floating the Upper Missouri. Snowstorms can occur at any time during the floating season, especially late spring and early fall. Take time to plan for the worst possible conditions if you go in May, June, September or October. Sudden violent thunderstorms, frequent in the summer months, can plummet temperatures 20° to 50° in minutes and create dangerous conditions along the river including lightning, high winds and hail.

Fishing

Fifty species of fish, ranging from tiny minnows (weighing a half-ounce) to immense paddlefish (which can grow to 140 pounds) reside in the river. Most of the native fish observed by Lewis and Clark are still found here today and include six Montana Species of Concern; pallid sturgeon, blue sucker, paddlefish, sauger, sicklefin chub and sturgeon chub. The pallid sturgeon is a federally listed endangered species. It is protected under the Endangered Species Act of 1973 and if caught must be returned immediately to the water. Anglers are required to have a special tag to fish for paddlefish, another unusual native fish species. Other native species found here include goldeye, sauger, channel catfish, freshwater drum/sheepshead and shovelnose sturgeon. Non-native smallmouth bass, walleye and northern pike are also frequently caught. Yes, fishing is permitted. A Montana State resident or non-resident fishing license is required.

Snakes

On occasion, you may encounter the prairie rattlesnake (*Crotalus viridis*) along the Upper Missouri River. This species is native to this area and was frequently encountered by the Lewis & Clark Expedition. Unless provoked or surprised, the prairie rattlesnake is typically non-aggressive. Be careful when walking through tall vegetation, among rocky outcroppings, or around old homesteads. Use caution when gathering firewood.

Rattlesnakes are of course venomous, but there are also bull snakes, Western hognose, yellow-bellied racers, garter snakes and rubber boas located here which are not poisonous. Consider yourself privileged if you see one of these special residents. Please be cautious and conscientious when encountering any of these snakes. Step away slowly and remember that not all rattlesnakes actually rattle when encountered. Please do not harm these animals in any way. They are free rodent control!

You and your parents should carefully read the following information. It contains a wealth of material to help explain and prepare you for the trip. Any questions you or your parents have should be brought to the attention of the Scoutmasters. We will attempt to provide answers to make this trip enjoyable and safe for all.

Missouri River Itinerary July 14-26, 2020

Tuesday, July 14, 2020

- 6:00AM ET Depart from Pemberville Elementary School
- 5:00PM CT Arrive at Sibley State Park, 800 Sibley Park Rd., New London, MN 56273 (320) 354-2055

Wednesday, July 15, 2020

- 7:00AM CT Depart Sibley State Park
- 6:00PM MT Arrive at Benton RV Park and Campground, 2410 Choteau St., Fort Benton, MT 59442 (406) 622-5015

Thursday, July 16, 2020

- 8:00AM MT Arrive at Missouri River Outfitters, 2307 Main St., Fort Benton, MT 59442 (406)-671-0268
- 10:00AM MT Begin Canoeing on the Upper Missouri River

Friday, July 17, 2020

- 8:00AM MT Canoeing on the Upper Missouri River

Saturday, July 18, 2020

- 8:00AM MT Canoeing through the White Cliffs Area

Sunday, July 19, 2020

- 8:00AM MT Canoeing through the White Cliffs Area

Monday, July 20, 2020

- 8:00AM MT Canoeing through the Badlands

Tuesday, July 21, 2020

- 8:00AM MT Canoeing through the Badlands

Wednesday, July 22, 2020

- 7:30AM MT Canoeing through the Badlands to James Kipp Recreation Area
- 2:00PM MT Depart for Super 8 Motel, 105 Centennial Dr., Livingston, MT 59047 406-224-4099
- 5:00PM MT Arrive at Super 8 Motel in Livingston, MT

Thursday, July 23, 2020

- 8:00AM MT Depart for Yellowstone National Park
- 10:00AM MT Tour north side of Yellowstone National Park on way to Madison Campground.

Friday, July 24, 2020

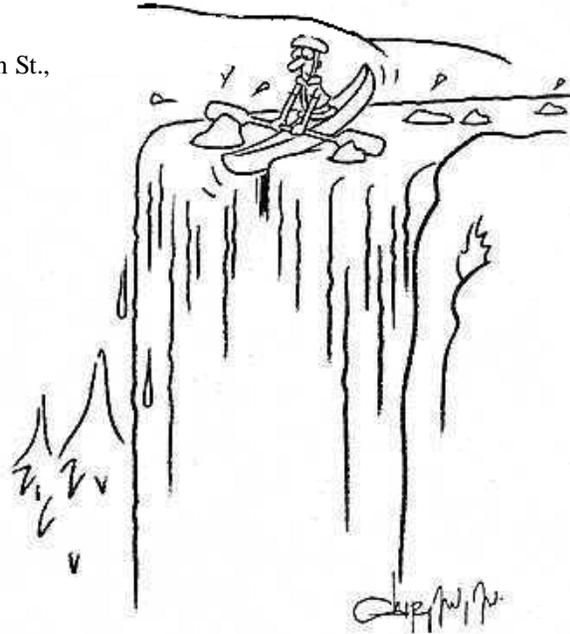
- 8:00AM MT Tour south side of Yellowstone Park on way to Clearwater Campground, Soshone National Forest, North Fork Hwy, Cody, WY 82414
- 6:00PM MT Arrive at Clearwater Campground, Soshone National Forest.

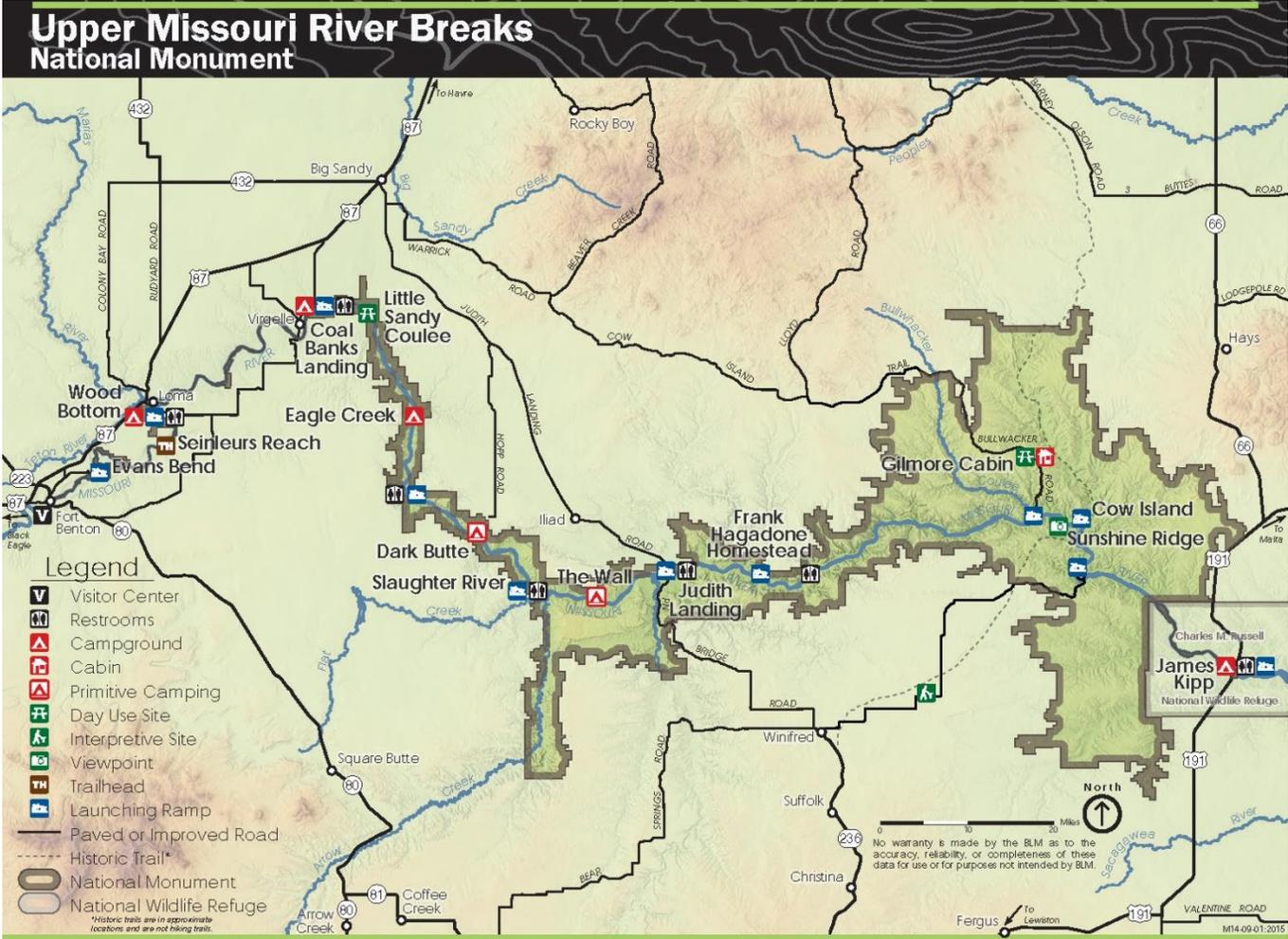
Saturday, July 25, 2020

- 6:00AM MT Depart Clearwater Campground for Mount Rushmore, 13000 SD-244, Keystone, SD 57751
- 2:00PM CT Arrive at Mount Rushmore
- 4:00PM CT Depart for Super 8 Motel, 1700 South Burr Rd., Mitchell SD 57301 605-996-9678
- 8:00PM CT Arrive at Super 8 Motel, Mitchell SD

Sunday, July 26, 2020

- 6:00AM CT Depart Super 8 Motel, Mitchell SD
- 9:00PM ET Arrive at school in Pemberville.





Float Distances and Times		
River Locations	River Mileage	Float Time
Fort Benton to Wood Bottom	0 - 20.3	1 day
Wood Bottom to Coal Banks Landing	20.3 - 41.5	1 day
Coal Banks Landing to Judith Landing	41.5 - 88.5	2 days
Judith Landing to James Kipp Recreation Area	88.5 - 149	3 days

Estimated Trip Expenses

Cost estimates are based on 28 people participating.

Van rental		\$1500.00
Gas	900 gallons @ \$3.00/gal	\$2700.00
Canoe Rental	\$30/day (14 canoes for 7 days)	\$2940.00
Food	\$10/day/person	\$3360.00
Campground/Motel Fees		\$2597.00
Missouri River float fees (\$4.00/person/day)		\$784.00
Shuttle Fees		\$1125.00
River waste disposal expenses		\$980.00
Miscellaneous expenses (tolls, maps, equipment etc.)		\$600.00
Tee Shirts	\$15 X 28 people	\$420.00

Total cost		\$17006.00
Cost per person (total cost ÷ 28 participants)		\$608.00

We will collect \$700.00 per person.

**Scouts will need spending money for meals while on the road and souvenirs.



Why Canoeing?

The idea of traveling along waterways in a canoe can capture your passion in a way few things do. It definitely allows for a connection with the nature surrounding a person that cannot be found elsewhere. Not only are you enjoying the water and the serenity of the surrounding forests, but you may see a lot of wildlife that the average person never gets to see. You can learn a lot about our environment in these natural surroundings.

You can experience the power of the water through rapids and whirlpools. Canoeing in whitewater is full of adventure. Not only is this sport great for those in need of some serenity in their lives, but also for those seeking adventure. Few things can give you the adrenaline rush that paddling through whitewater can! Maneuvering through whitewater can take some skill, but the thrill is totally worth it.

Canoeing facilitates and even enhances many other activities. There is no quieter way to access those hard to reach fishing holes than by drifting up in a canoe. Canoeing as a means of transportation adds a whole new dimension to camping trips.

Canoeing is also great exercise. There are few activities that offer this degree of aerobic exercise mixed with the upper body conditioning. The movements you make during a canoeing trip give your upper body an incredible workout. But even better than the rowing machine at the gym, you can do it in a beautiful environment.

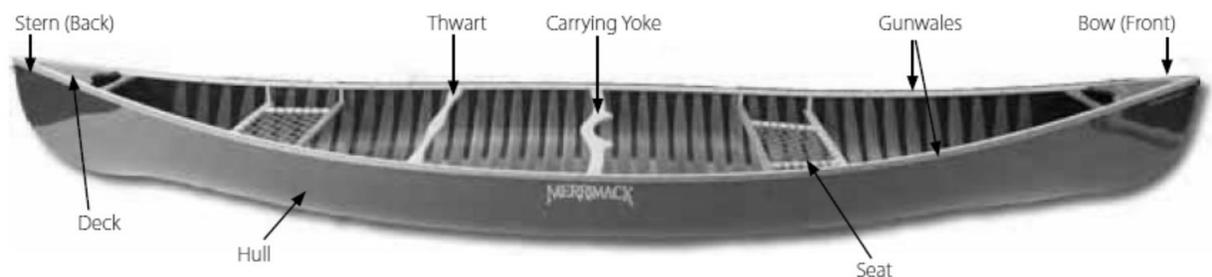
Canoeing is a great way to keep cool in the summer. On those hot summer days when it seems like there is no relief from the scorching rays of the sun and everything inside of you says to stay in the air conditioning you have somewhere to turn. Out on a lake where a cool breeze might pick up or feeling the spray of the water on your face is a great way to keep cool and get exercise at the same time.

Canoeing is a great activity to share with friends. When you're paddling a canoe with someone, you have to work together or you'll just go in circles. This activity can help build teamwork skills and communication skills. This is just one of those sports that is even better shared with others, not just for the camaraderie but also from a safety standpoint. The stories from just one canoeing experience often provides for a lifetime of reminiscing, tale-telling, and laughter.

That's right, canoeing is fun. Do we really need a reason to paddle besides this one? It is true that canoeing is great exercise, can be relaxing, provides a sense of adventure, and a whole list of other things but when it is boiled all the way down to the essential reason why people paddle it all comes back to this one reason. Canoeing is fun! Everything else is just an added bonus.

Canoeing Terminology

Before getting started, take a couple minutes to go over a few definitions. Canoes are relatively simple crafts, but there are some technical terms you should become familiar with.



Amidships: The center or middle of a canoe.

Bailer: A scoop (usually made from an empty bleach jug by cutting off the bottom) for dipping accumulated water from the bottom of the canoe.

Beam: The width of the canoe, typically provided in three measurements: waterline, gunwale and maximum width.

Belly: The bottom of the canoe.

Bilge: The point of greatest curvature between the bottom and side of a canoe.

Bow: Front end of the canoe. The person sitting in the front of the canoe is referred to as the "bow" paddler.

Broach: To turn suddenly into the wind.

Broadside: A canoe, which is moving perpendicular to the current of a river, thus exposing its broad side to obstacles in the water.

Deck: Panels attached to the top edge at the bow and stern ends of the canoe.

Depth: The distance from the top of the gunnels to the bottom of the canoe when measured at the beam (sometimes called center depth, as opposed to the depth at the extreme ends of the canoe).

Draft: The amount of water a canoe draws.

Entry Line: Shape of the bow where it cuts through the water.

Flare: Occurs when the sides of the canoe are wider above the waterline, particularly at or near the gunwales.

Flotation: Buoyant material set into the ends (or other panels) of a canoe to make it float if upset.

Foot-brace: A wood or metal bar against which a paddler braces his or her feet. Foot-braces help secure the paddler in the canoe and so add to the efficiency of his or her strokes.

Freeboard: Distance between the gunwale and waterline at the lowest point.

Gunnels: Both outside and inside, top finished edges of a canoe. Also referred to as rails.

Gunwale: The upper edge of the canoe's sides. Each canoe has two of them that span the entire side of the canoe from bow to stern. The thwarts and yoke connect the two gunwales to provide the structural stability. Often the most mispronounced word in the boundary waters. It is pronounced like "gun-nul", and not "gun-whale" or "gun-wall".

Hull: Frame or body of the canoe.

Keel: Structural member of a canoe that runs lengthwise down the center of the canoe to provide balance and stability. On aluminum canoes, the keel protrudes from the hull. Most Kevlar canoes do not have a keel, while some canoes have a "V" shape that acts as a modified keel.

Lead Boat: The lead boat paddles ahead of other canoes or kayaks in a group. Usually the most experienced paddler.

Leeward: A sheltered place out of the wind. Also, the direction toward which the wind is blowing.

Lining Rope: Rope used to tie up a canoe or pull it around obstacles in the water. Also refers to working a canoe downstream around obstacles in the water with the aid of ropes (lines) attached to the bow and stern.

PFD (Personal Flotation Device): Also referred to as a Life Jacket or Life Vest. It is required that any vessel on the water must have at least one PFD for each person in the vessel. In most states it is required that children must wear a PFD while on water.

Port: The left side of a boat, as perceived by a person on the boat facing the bow (or front) of the boat. Port is not synonymous with "left." When facing the stern (or rear) of the boat, the port will be on your right side.

Portage: The physical act of carrying the canoe over land.

Put-in: The place you put your boat into the water.

Rails: The gunwales (gunnels) of a canoe.

Ribs: Lateral supports which run at angles to the keel on the inside of a canoe. Ribs provide hull rigidity and structural strength.

Starboard: The right side of a boat, as perceived by a person on the boat facing the bow (or front) of the boat. Starboard is not synonymous with "right." When facing the stern (or rear) of the boat, the starboard will be on your left side.

Stern: Back end of the canoe. The paddler sitting in the back is the stern paddler and is in charge of the bulk of the steering and maneuvering of the canoe.

Sweep Boat: The last boat in a group of paddlers that is usually assigned to keep track of stragglers.

Take-out: The place at which you take the boat out of the water.

Thwart: Other structural support bars like the yoke that are located closer to the bow and stern ends of the canoe.

Waterline: The place to which water comes on the hull of the canoe when it is set in the water.

Yoke: A strong crossbar in the middle of the canoe designed for carrying the canoe on the shoulders. Often includes two yoke pads for more comfort.

How to Choose a Canoe Paddle

Dreaming of exploring a series of lakes in the Boundary Waters Wilderness? Or is a fast-moving, heart-racing run down whitewater rapids more your style? Either way, if you want the perfect adventure, you'll need the right paddle! Don't know what's right for you? Read the following article to help you choose. With the proper paddle, you'll canoe more efficiently and tire less easily, making your time on the water more enjoyable.

First, Determine the Proper Length

Contrary to what you may have heard, standing height is not an accurate way to size a canoe paddle. Since you sit while boating, the best way to choose a paddle length is to sit — either in a canoe or on the floor. Most flatwater and whitewater canoeists will require a paddle in the 52" to 60" range, but lengths vary to fit paddlers of all sizes. Bent-shaft paddles are shorter overall, with common lengths of 48" to 54". There are several ways to determine which length is right for you.

At Home

Kneel down with your seat about 6 inches off the floor, as if sitting in a canoe. Measure from the floor to your nose. Add this measurement to the blade length. The total is the correct overall length for your paddle.

In the Store

Kneel down with your seat about 6" off the floor, as if sitting in a canoe. Hold the paddle upside down, with the grip on the floor. If the paddle length is correct, the blade should start right about even with your nose.

On the Water

Sit in your canoe and measure the vertical distance from your nose to the water. Add blade length to get the correct overall paddle length for you.

Fine-Tuning Fit

- If purchasing a bent-shaft paddle, follow the above instructions, but deduct 2" to 4" from the length.
- Canoe width affects length. In a wide canoe, a longer paddle allows you to reach the water without stretching or straining. A paddle that's too short requires extra effort to get the whole blade in the water, making it difficult to propel the boat.
- If you're buying for a child, consider a paddle made especially for children. Besides having shorter lengths, they're built with narrower shafts and T-grips, which are easier for little hands to control.

Choose a Material

The less a paddle weighs the less fatigue you'll feel during a long day of canoeing. But don't choose a paddle based on weight alone — the best paddles offer a good balance of light weight, strength and flexibility. For whitewater canoeing, a strong, stiff paddle will hold up to the rigors of the river and provide a quick response in rapids. For flatwater canoeing, a flexible paddle helps absorb shock with every stroke.

Wood

Wood is by far the most popular material for canoe paddles. It transmits the feel of the water well, and it flexes slightly to absorb shock. It also retains warmth, so hands stay comfortable in cold conditions. Many wood paddles have a layer of fiberglass over the blade for added strength and/or have a tip guard to improve durability and help resist abrasion. Some upkeep, such as sanding and varnishing, is required to maintain its appearance. Hardwoods (such as ash and maple) and laminates that include hard and soft woods are more durable (and more expensive) than those made only from soft woods.

Fiberglass

Lightweight, durable and virtually maintenance-free, fiberglass paddles can be more expensive than those made of other materials. The nature of fiberglass allows manufacturers to design and build paddles with precision, adding specific amounts of flex or creating complex blade shapes for casual or competitive use. Whitewater canoe paddles are often made of fiberglass.

Aluminum Shaft/Polyethylene Blade

Durable and economical, paddles with aluminum shafts and plastic blades are heavier than paddles made from other materials. Aluminum shafts can feel cold in cool weather, and often feature a vinyl or foam pad where your hand grips the paddle. They make great spare paddles, and can be a good choice for beginners. Blades are made from a variety of plastics, including polyethylene, polypropylene, thermoplastic and ABS.

Blades

Blades vary in width and length. A large, wide blade will power you through the water quickly, but each stroke requires a lot of energy. A small, narrow blade is easy to paddle and more efficient over a period of time, but your stroke will not be as powerful. Some specialized paddles designed for flatwater cruising feature long, narrow blades, which offer a fairly good balance of power and efficiency for this type of canoeing. Not sure what size to get? Paddle blades measuring 8" x 20" are most common and are a great choice for most canoeists.

Something else to consider: Square-tipped blades can catch in the water and throw a paddler off balance. Beginners may want to consider rounded blades, which are more forgiving.

Grip Shape

The 2 most common shapes on canoe paddles are the palm/pear shape and the T.

- Many flatwater paddlers will choose a pear grip for comfort and control. The shape fits naturally into the palm of your hand and is comfortable for long hours on the water.
- The T-grip is the preferred shape for whitewater paddlers and some flatwater paddlers. It allows for more control over the angle of the paddle blade and it's easy to hang onto in rough water. Children's paddles usually feature a T-grip because it's easier for small hands to hold.

Don't Forget the Shaft

Shafts are available in 2 styles: bent or straight.

Straight

Traditional canoe paddles have straight shafts. These are a great choice for all-around paddling. Whitewater canoeists almost always prefer them, as they allow a variety of maneuvering and bracing strokes. This is important when you need to steer around rocks or plow through rapids on a river.

Bent

Bent shafts help position the blade for maximum efficiency on flat water. The bend in the shaft helps the blade remain vertical in the water during the most powerful part of your stroke. It also helps the paddle enter and exit the water smoothly. Angles range from about 7 to 14 degrees. Smaller angles are not as efficient for long-term paddling, but they allow a greater variety of strokes. For multi-day tours of continuous paddling, consider a larger angle.

Shape

Shafts can be round or oval in shape. Oval shafts offer a more comfortable grip than the traditional round shape. Some round shafts feature an oval section for better grip. This is called oval indexing.

Carry a Spare

If you lost your paddle on day 3 of a 5-day canoe trip, what would you do? What if it broke in the middle of a whitewater run? Without a spare, you might literally find yourself up a creek without a paddle. An aluminum-and-plastic paddle makes an inexpensive spare that could save you a lot of time and grief should the unexpected happen, even if you're only out for a day trip.

Water Class and Characteristics

The following scale is used by whitewater canoeists to rate the difficulty of rapids:

Flat Water: Water without rapids, such as a lake or slow-moving river.

Whitewater: Foamy (air-filled) turbulent water.

Class I: Easy—easy bends, small rapids with low waves. Obstacles like fallen trees and bridge pilings. River speed less than hard back-paddling speed.

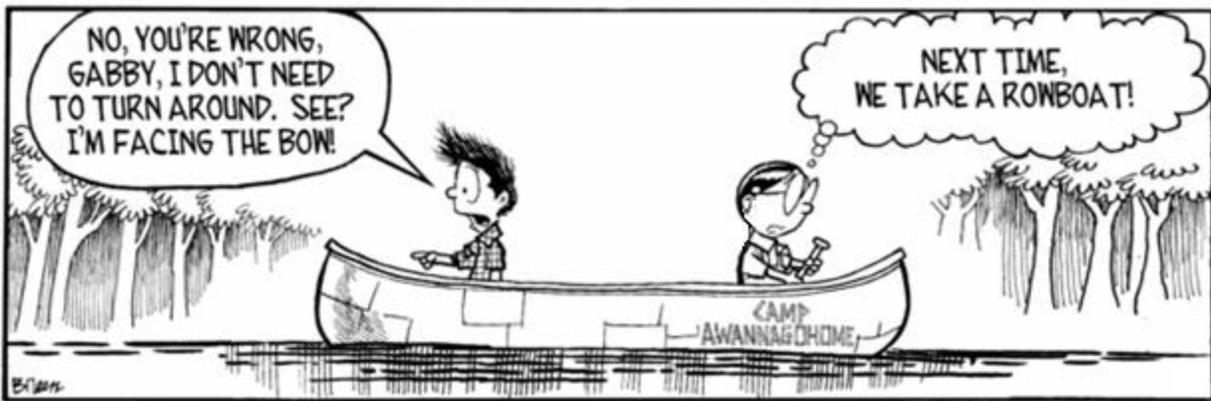
Class II: Medium—fairly frequent but unobstructed rapids with regular waves and low ledges. River speed occasionally exceeding hard back-paddling speed.

Class III: Difficult—small falls: large, regular waves covering boat. Expert maneuvering required. Course not always easily recognizable. Current speed usually less than fast forward-paddling speed. Splash skirt useful.

Class IV: Very Difficult—high, powerful waves and difficult eddies. Abrupt bends and difficult broken water. Powerful and precise maneuvering mandatory. Splash skirt essential.

Class V: Exceedingly Difficult—very fast eddies, violent current, steep drops. Splash skirt essential.

Class VI: Limit of Navigability—navigable only at select water conditions by teams of experts in covered canoes. Cannot be attempted without risk of life.



Canoeing Packing List

One of the pleasures of journeying by boat through the backcountry is being able to include minor luxuries that one might normally leave at home. Although, weight is a consideration and bulky items should be minimized to save space. Careful and systematic packing is a boon for getting to and from the water efficiently. Spending the extra time to logically organize items together before a trip will save you the stress of trying to locate lost items. Experienced paddlers typically pack gear according to how and when it is used.

Pack a separate "car bag" to hold everything you might need for the ride to the water to avoid digging through your main gear bags for things. Include a change of clothes and even baby wipes to feel refreshed rolling home.

An accessible "day gear" bag should have everything you will need while on the water like clothing layers, rain gear, and other personal gear and food. Emergency, safety, and repair gear should also be close at hand. Camp gear and food can be sorted into different dry bags or a large portage pack and secured. Take care not to pack and store food and stove fuel together to prevent contamination.

Finally, this packing list provides a comprehensive gear selection for most warm weather canoeing adventures. Many factors like climate, water temperature, and trip duration will dictate what specific gear may ultimately be taken along, so adapt this list to your particular needs.

Packing Notes

When packing, remember that things get wet on canoe trips. Generally it's best to pack in two piles – one you don't mind getting wet and the other you want to keep dry. To keep stuff dry, either pack it in two layers of trash bags or get a dry bag from Wal-Mart. If you choose the trash bag method, bring extra trash bags – they tear easily. Pack your sleeping bag and clothes in a dry bag. Water won't generally hurt the tents, ground cloths, rain gear and so forth and they will be fine in garbage bags. If items get wet, there will be time in camp for them to dry out.

You can either pack the gear you don't care about getting wet in a standard pack or a mesh duffel bag. A mesh duffel bag is nice because it allows the gear to air out and helps prevent mildew. Make sure everything fits in one or two modest packs. It's best to travel light and second if a boat capsizes it's a lot easier to recover everything floating down the river if it's all in a few packages than if it's a bunch of separate items.

Why not pack everything to stay dry? The reason is that about one half the gear always goes on the bottom of the canoe. If everything is packed to stay dry there's a good chance that the stuff you want to keep dry will go on the bottom, where it might get punctured and then gets wet (think of your sleeping bag). You might end up sleeping more comfortably at night if you know which gear is best placed in the bottom of the canoe.

Special Notes:

Footgear: It's important to have one pair of shoes (not leather), that can be worn in water that will stay put and protect your toes. Crocs can be worn around camp but are not suitable for moving water. River sandals such as those made by Teva or Chaco are adequate but you may want to wear them with a neoprene sock to prevent blisters and to make sure they stay securely on your feet. The best choice would be a closed toe river shoe. Many people bring along Crocs or sandals to wear around camp to give feet a chance to dry out. Participants may not be barefoot at any time.

Fabrics: Wool/Synthetic/Thermal fabrics such as Polartec, Duofold, Capilene, Thermax, Polar Plus, polypropylene, fleece, nylon, and wool all work well in a wet environment as they absorb little moisture and dry quickly. These fabrics retain their insulating properties when wet while cotton does not! Please check the clothing labels to avoid poly/cotton blends.

Pack light: Otherwise the canoe will be harder to handle and the trip won't be as fun.



"According to this load analysis, we're overweight by one hundred and fifty pounds. Any suggestions?"

Warm Weather Canoeing Packing List

Consider borrowing equipment you don't already own. Keep weight down; bring as little as possible but be sure to bring essentials. All clothes, sleeping gear and food are stored in waterproof bags.

Dry/Camp Clothes

- Hiking Boots **
- Pants (Long)
- Shorts (2) (nylon)
- T-Shirts (3)
- Underwear (3)
- Camp shoes (lightweight)
- Sleeping clothes
- Socks
- Socks (hiking) **
- Socks (liner) **
- Fleece jacket

Wet/Travel Clothes

- Hat with full brim
- Personal Floatation Device
- Rain gear
- River shirt - Long sleeve
- River shoes (see *Special Notes*)
- River socks (see *Special Notes*)
- Swim suit (without mesh liner)
- Neoprene paddling gloves **

Shared with buddy

- Tent
- Waterproof ground cloth
- Trowel
- Parachute cord (25 ft.)

Basic Gear

- Food
- Spoon

- Bowl
- Cup (with measured markings)
- Compass
- Day pack
- Butane lighter or matches in waterproof container
- Fishing equipment, filet knife, and license **
- Headlamp (with spare batteries)
- Garbage bags (large) – 4 or 5
- Dry bags
- Knife or multi-tool
- Sleeping bag (in dry bag)
- Sleeping pad
- Camp pillow **
- Bandana
- Backpacking towel
- Water bottles (2) - 1 liter
- Whistle
- Zip lock bags, 4-5 (gallon size)
- Mesh duffel bag
- Bear canister/bags
- Canoe seat with back **

Personal Items

- First aid kit (include antifungal cream for athlete's foot, gold bond)
- Insect repellent (cream)
- Lip balm (with sunscreen)
- Prescription medications
- Sunscreen (minimum SPF 15)

- Biodegradable soap
- Toothbrush/paste
- Toilet paper in Ziploc bag
- Hand sanitizer (inside of toilet paper roll)
- Watch
- Sun glasses (polarized) - with floating retainer strap
- Camera (waterproof)

Group Gear

- 2.5 gallon collapsible water containers - one per 4 people
- Backpacking stove
- Scouring pad
- Cooking pots
- Dining fly
- Maps
- Repair kit - needle, thread, duct tape, zipties, etc.
- Rope - parachute cord (75 feet)
- Utensils – ladle, whisk, serving spoon
- Fuel bottles
- Stove repair kit
- Shower/wash bag
- Water purification tablets
- Water filter
- Wilderness Permit
- Entertainment (cards, Frisbee, Nerf ball, rope for swings)

** Indicates optional items



Packing and Securing Gear in Your Canoe

Assembling and inspecting all your gear well in advance of any trip is a wise use of your time. You'll likely remember things that need fixing, like a broken jacket zipper, and have plenty of time to take care of these repairs or replenish any supplies. In addition to reminding you of equipment maintenance, laying your gear out will help you determine if you can fit all of these items into your canoe. Again, discipline yourself to remove unnecessary gear if possible.

Keeping It Dry

It's a matter of fact that water will enter the canoe during a paddle. To keep gear dry, waterproof all items. You can do this in two ways. One method is to line regular backpacks and stuff sacks with heavy duty plastic bags, and then pack in your gear. The second is to purchase and store items in heavy-duty, waterproof containers.

There are many options available when it comes to size, material and shape of waterproof carriers, but most fall into soft or hard-cased options. Vinyl dry bags come in various sizes, and some feature transparent sides, which is handy to quickly identify items. Boundary bags are a level beyond basic dry bags. Still made with vinyl, boundary bags feature padded shoulder straps to make portaging easy. Hard cases and waterproof marine boxes come in a variety of shapes and sizes and are good for packing lanterns, stoves, cameras and other fragile items.

Packing Your Gear

It's a good idea to continue your visual inspection by packing gear into the carry containers you'll use to load the items into the canoe. Many veteran canoeists will tell you to keep like items together. Having designated bags for food, cooking, clothes, first aid, and sleeping and camping gear is a good idea. Remember that if you portage your canoe, you will need to carry these things, so it pays to try and keep items in large containers to reduce the number of trips from take-out to the next put-in points.

Once you've organized your gear and stored it in protective storage bags, the next step is to pack it correctly inside your boat. There's no single "right" way to pack a canoe. But there are a few important considerations that you should keep in mind:

Access

As you store your gear and clothing in your boat, consider how likely it is that you'll need access to it during the day. Pack equipment that you'll need to get to (like your lunch or an extra clothing layer) near the top of your load, and less crucial gear (like your tent, which you probably won't need until nightfall) near the bottom.

Safety Concerns/Special Placements

- **First-aid kit:** A first-aid kit needs to be close at hand. Store yours under your seat or in a nearby seat or thwart pack.
- **Emergency paddles:** Emergency paddles must be immediately accessible, yet secure enough that they aren't dislocated in rough conditions or capsizes. Most canoeists store them flush against one of the gunwales on the side of their main gear load, shock-corded in place.
- **Signaling devices:** Flares, whistles and other signaling devices should be carried on your person at all times. Most PFDs have small chest pockets that are perfect for the job.
- **Safety lines:** Safety lines should be immediately accessible. Make sure these coiled ropes are secure so they can't come loose and entangle anyone during a capsize.
- **Navigation equipment:** You may have to consult your map and compass a number of times during the day. Store them in a waterproof case, either tied/taped to a thwart, attached to a gunwale nearby, or stuffed in one of your paddling jacket pockets.
- **Incidentals:** Keep a supply of water and/or your water filter nearby so you don't have to stop paddling every time you get thirsty. Store a light snack or lunch nearby as well. Keep your sunglasses handy, either in a pocket or around your neck on some kind of leash. Stash your camera and binoculars close at hand, too, so you're ready for action.



"I told you to keep the rice in a plastic bag."

NOTE: Consider storing small items like the incidentals above in a seat or thwart pack along with your other day-use items, so they're easy to reach but aren't loose all over the bottom of your boat.

A Few Hints for Efficient Packing

- Make it as difficult as possible for water to get into your most important gear items. Wrap items like sleeping bags and stoves in extra plastic bags for additional protection, and then bury them deep in reliable waterproof dry bags.
- Pack a full set of dry clothes and a pair of shoes in a separate, small dry bag (apart from your main clothing bag), so that should something happen to your main clothes bag(s), you'll still have access to warm, dry clothes.

Test Loading

Continuing on the above step is test loading your canoe with gear. With time, you'll learn the carrying capacity of your canoe, but at first, you'll literally have to practice packing it on dry land. This step might seem overly meticulous, but it's better to test pack your gear on a sunny day on dry land and trouble shoot your cargo strategy in comfort. You don't want to find yourself trying to figure out how to load your canoe in the rain at the start of your camping trip.

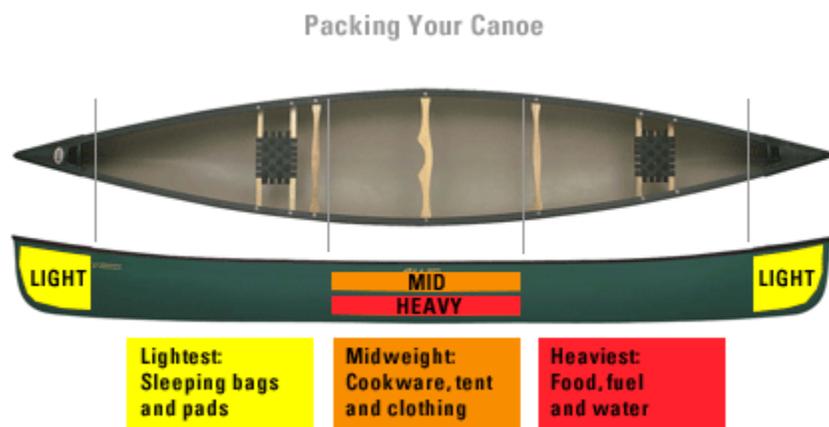
Test packing your gear will also get you thinking about how and where you'll want to place items in the canoe. For example, consider the items you want within arm's reach, such as water, sunscreen, bug repellent and a spare paddle. Also take the time during test packing to ensure you have the proper straps and ropes to tie down gear.

Loading Strategy

Beyond the basic loading strategy of fitting all of your camping gear into the canoe, there are more factors to consider. Weight distribution is one. The same principles apply to loading a canoe as do filling a backpack. Put the heaviest items where they will have the least impact on your balance and maneuverability.

In canoeing, this equates to packing the heavy gear on the bottom and in the center of the vessel. Medium-heavy items can be placed over heavier gear, and lighter items can be placed at the far ends of the canoe. This tactic will keep the canoe balanced and properly trimmed. It's likely you may need to shift some weight around once paddlers are in as well, but for the most part, the strategy of centering the majority of the weight is a common practice.

You should also keep the gear below the gunwales of the canoe or limit their height as much as possible. Loading items upwards will impact your balance and the canoe's centre of gravity. It will also provide more surface area for the wind to catch. Both of these two scenarios impact the overall stability and maneuverability of the canoe, which can get dangerous in high winds and rough water.



Trim

"Trim" refers to the back-to-front, front-to-back tilt of your boat. A well-trimmed boat lies flat in the water from front to back. The reason that trim is important is because canoes tend to act like weather vanes in the water. When winds (or currents) start pushing, the end that's sticking out of the water often turns downwind or down current, making staying on course much more difficult. A well-trimmed boat will drift sideways to the wind or current, making it easier for you to stay on course.

Poor trim is often at the root of common paddling problems. If one paddler consistently out-powers the other, for example, or both paddlers have to paddle on the same side of the boat to stay on course, the trim may be to blame.

To ensure proper trim, pack while your boat is in the water whenever you can. When checking for correct trim, keep in mind that your own weight (and the weight of your paddling partner) will affect the tilt.

NOTE: There are situations in which adjusting the trim so that it's a little tilted can actually make paddling easier. When traveling downwind, for example, a boat that's slightly bow-light may catch some wind and travel more quickly. Until you have a few paddling trips under your belt, though, concentrate on keeping your boat as flat and level as possible in the water.

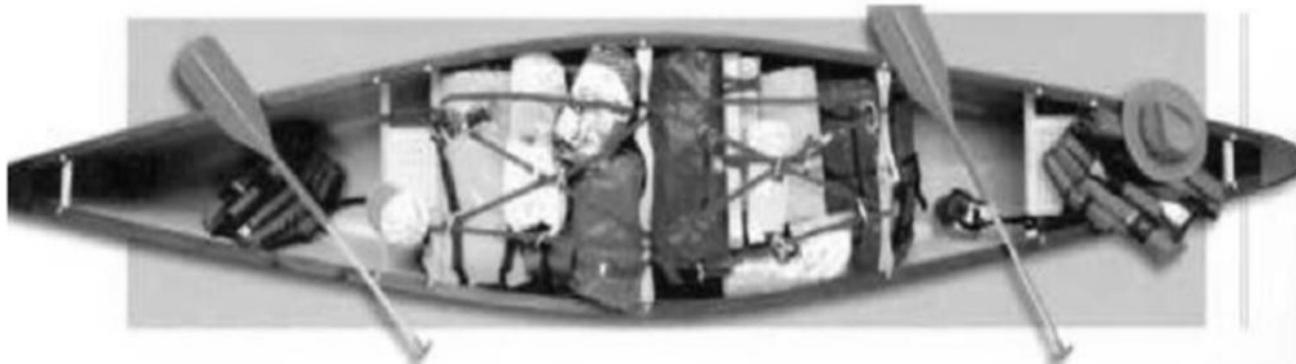
Tie It Down

Different canoe camping trips require different levels of load security. The main purpose of tying equipment down inside a canoe hull is to keep it from floating away or sinking should your canoe suddenly capsize. Always prepare as if you might "go over" during your trip. The chance of capsizing is never zero.

Also keep in mind that fast currents, big waves and winds can grab hold of storage bags and carry them off very quickly. Unsecured bags can be miles downriver or downwind before you have a chance to begin looking for them.

Once you load your canoe, secure the gear to prevent it from shifting around. This is critical to maintaining stability in rough water and to ensure you won't lose items in the event of a swamping. That said, use quick-release knots, tie-down straps, and bungee cords to make it easy to remove gear. Keep this step as uncomplicated as possible to make emergency maneuvers or multi-day portages straight forward and simple.

The most common way to secure equipment loads in place is with a single tie-down line. This involves running the tie-down line from a secure anchor point (usually one of the thwarts) over, under and around your bags until they're lashed securely in place. This approach works best when bags are already wedged securely under your thwarts. A single-line tie-down may loosen up during travel if your bags start shifting around.



Flatwater Trips

On short trips across calm, protected waters, paddlers typically secure their gear by either running pack and dry bag straps around their thwarts, or by tying short load lines from each storage bag to the thwarts. These techniques won't keep your gear bags in place in the event of a capsize. But they will keep your gear connected to the boat so it's easier to collect should your boat go over.

More Challenging Journeys

On longer, more challenging journeys (especially those which involve rough water or rapids), you'll need to make sure that your gear remains securely in place inside your canoe. This is important because:

Bags that are tied in loosely can "bob out" and get caught up on rocks, stumps, or trees.

Properly-secured dry bags and dry boxes provide added buoyancy (as long as they're sealed correctly and the weight of the items inside does not exceed the weight of the water the bag displaces). This added flotation can mean the difference between a sunk, pinned canoe and one which is quickly righted and paddled to safety.

Launching

Once you are properly geared, being prepared goes beyond equipment and clothing. Virtually any paddling trip should be regarded as a serious (and fun) outdoor pursuit. The paddler must be adequately prepared for the type of paddling trip he or she is taking. Knowledge of the waterway, length of the trip, weather, water conditions, and a realistic assessment of the skill level of everyone on the trip is key to a safe and enjoyable outing. Whitewater, wilderness waterways, open ocean, and cold weather paddling all require special preparation and skills. Also, keep in mind that a day or afternoon of paddling can demand strenuous physical exertion.

Keep in mind that exploring rivers with significant current will require you to place a car at the take-out (final destination) before driving to the put-in (starting point). Always take care to protect the car keys. Many paddlers have made mistakes such as leaving the keys for the car positioned at the take-out in the car at the put-in, or even worse, losing car key while on the water.

Once you arrive at the put-in, take care while unloading. Remember to lift with your legs so as not to strain your back. Since you should always paddle with a buddy, you can help each other with unloading and carrying.

While you're at the put-in, remember to also show respect for others around you. Other sportsmen and neighboring property owners are likely seeking the solitude and purity of undisturbed nature. Don't hinder their experience by littering, playing loud music, changing clothes in public, or other potentially offensive actions. Plus always get permission in advance if you want to cross private property in order to access a particular waterway.

The next step is actually getting in the boat and beginning your journey. When launching from a steep bank or dock, place your boat in the water alongside and parallel to the shoreline, and hold on to it. Squat down next to your boat and carefully shift your weight over the centerline while holding the top sides of your boat and quickly kneel down. You can add stability by holding your paddle perpendicular across the top of the boat and leaning on the blade resting on the shore or dock. Tandem paddlers should board one at a time and stabilize the boat for each other. When launching on the shore or shallow shoreline, you can wade into ankle deep water and continue the process as above.

On the Water

Once you are on the water, it is time to control this beast of a boat that seems to have a mind of its own. In theory, paddling is really rather simple. There are only three types of strokes: propelling, turning and bracing. But these three stroke types can seem somewhat daunting when one considers the multitude of variations and stroke combinations. With the proper level of skill, just a simple flex of the wrist can alter the direction of travel and the angle of the boat.

Check first to make sure you're holding your paddle correctly. Choose the side of the canoe on which you want to paddle. This side becomes your on-side. Your hand on this side is the shaft hand (i.e., the hand that holds the shaft of the paddle). Your other hand is the grip hand, which rests on top of the paddle's grip and controls the angle of the blade. Your hands should be spaced comfortably about shoulder width apart, and your arms should remain mostly straight. If you plan to tandem paddle with one partner often, remember that you need have opposite on-sides.

There are a few basic principles for achieving maximum efficiency from a paddle stroke. First for maximum power transfer, angle the blade perpendicular to the force of resistance. In other words, when you want to move the canoe forward, hold the paddle vertically such that the face of the blade points flat towards the rear. Also, as you apply power through the stroke, ensure that the blade remains vertical to the water's surface. Any alterations to the lateral and vertical angles of the blade will either affect a turning motion or create lift of the water (wasted energy if you're just trying to go straight).

When you execute a paddling stroke be sure to not be a "lily-dipper." In other words, make sure that the blade of the paddle is fully submerged in the water at the mid-point of your stroke. You should power the stroke from your major muscle groups. You'll find that you have much more strength and endurance in your back and shoulders than in just your arms. Therefore, by rotating your torso and unwinding through the stroke, you'll go further than from just pulling on the paddle with your arms. Also by rotating your torso such that your chest always faces your paddles, you'll protect yourself from possible shoulder

injuries. When you first start out, this principle is easily applied by watching the blade throughout each stroke. As you gain experience, you'll be able to rotate your body effectively while looking in any direction; usually the direction you want to go.

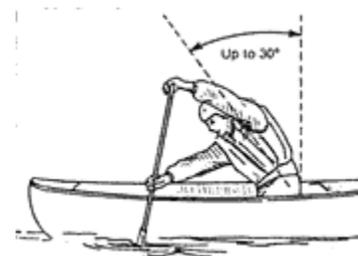
The basic strokes are really pretty simple. Some of the basic strokes in paddling are the forward stroke, the J-Stroke, and various forms of cross strokes, including cross forward, cross draw and cross back.

Forward Stroke: The paddle enters the water comfortably ahead of the paddler's position. With the blade perpendicular to the keel line and the paddle vertical, pull straight along the side of the canoe. Keep both arms relatively straight throughout all phases of the stroke. Push forward and down over the blade with the top arm and pull with the lower arm. Body and shoulder rotation provides much of the power.



J-Stroke: This stroke provides forward momentum at the same time that it keeps the canoe on a straight course. Start off with a forward stroke, but then push the top hand farther out over the water than the lower hand. This motion moves the blade under the boat and carves the water by levering the paddle off the boat. The last push away from the boat should be a quick one.

Cross Forward: Executed parallel to the canoe's centerline. Both hands remain over the water, keeping the paddle shaft vertical to the water. The stroke is short and performed in front of the body. The paddle is planted as far forward as a person can lean comfortably. Move the upper body forcefully to an upright position and stop the stroke at your knees. An underwater recovery helps to establish a quick back-and-forth rhythm.



Cross Back: More often used by solo paddlers, this stroke requires good upper-body flexibility. The paddler crosses over the boat with the paddle and inserts the blade opposite the hips. The body must be rotated until the shoulders are almost parallel to the boat's centerline. This stroke is a powerful way to stop a boat quickly to scout a rapid, and is usually used with a back stroke to maintain position in the river.

Canoe Rescues

Always wear your PFD while canoeing. It is extremely difficult to put on a PFD while you are in water (assuming you have one within reach!) If the canoe capsizes, always think of safety first by making sure that you and your passenger are OK before trying to save the canoe and your belongings. Stay with your canoe (it floats!) and capture any floating items. You can crawl into the swamped canoe and paddle it to shore or swim alongside the craft and push it in. When you are able to touch bottom turn the canoe over and lift it out of the water.

Single Canoe Rescue

If you are canoeing in fast water and you capsize in water only knee to waist deep, you are going to have to grab onto your canoe, try to retrieve your paddles and swim your canoe to shore, empty it and start out again. (Grab the paddles first because they float away the fastest and then swim to grab the canoe.)

This is why it is always good to have an extra paddle tied into one of the canoes in your group just in case you cannot catch the paddles while they are floating down the river. (It is possible to canoe with one person paddling.)

If you are in really fast water and you capsize, you are going to be moving quickly down river. Keep your feet out in front of you. Do not let your body get switched around so that your head is going down river first. If you do get switched around backwards and your head is going down the river first, get back to the position of your feet in front of your body as fast as you can and try to watch where you are headed.

Really fast rivers are full of rocks everywhere protruding out of the water. You do not want to hit your head going down river so swiftly. If it is possible keep a hold of the canoe until you reach calmer water, if you can't keep a hold on the canoe let it go, get yourself to shore first and your canoe will pop up somewhere close by. Once you have your canoe ashore empty it, take a breather and away you go again.

What do you do if you are canoeing in a lake, the water is really deep and you are too far from shore to swim the canoe back to land to empty the water out of your canoe? First of all do not panic, hopefully you have your life jackets on. If you don't and they are floating around in the water get them on quickly. You are going to need your strength to do this.

Get your paddles before they float away and stick them up under your canoe thwarts. They should stay in there. If they slip out just put them back in again (paddles float).

If you are in the water and the canoe is not upside down, turn it upside down. Both paddlers should get into the air pocket under the canoe. You'll need both hands to right the canoe so cradle your paddles under the thwarts to get them out of the way. You'd be surprised how secure they are in this position—they'll be ready to use when you're back inside the upright canoe.

Next, try to lift the canoe a bit to get some air under it. Both people need to get under the canoe. There will be lots of air under there and lots of room to breathe. You can always use this as a resting spot if you get tired.

This next part is where the work comes in. Make sure that you have good communication with each other. Untie anything that is tied into your canoe. The canoe is heavy enough without things tied into it; you can retrieve these later if they float.

Stay under the canoe. You are going to have to push the canoe up off the water and give it a flip to turn it back over which is really hard to do.

Both paddlers position themselves at their respective seats on the same side of the canoe. Work together and lift one gunwale slightly out of the water to break the airlock. Kick your feet really hard and push up with your arms as hard as you can at the same time and fling the free gunwale up into the air. Quickly flip it back over. If your timing is right, the canoe will land upright and relatively free of water. More than likely in the first couple of tries your canoe will still be full of water, but don't get discouraged. Just turn it upside



down again, get back under the canoe and try again. Your canoe does not have to be completely empty of water as long as most of it is out.

Now that your canoe is flipped back over and it is empty, you are still in the water. All you have to do is get back in—which is the hardest part. The canoe sides are really high up and as soon as you grab onto one side and pull down it will tip back over again.



Position yourself next to your seat, and on the opposite side of the canoe from your partner to act as a counterbalance. Both paddlers do a big scissors kick and heft themselves onto the gunwale. The trick is that both paddlers must be doing this at the same time. Their bodies should be half way across the top of canoe with their legs hanging over their side. Next, each will roll their body at the same time so that their rear ends land into the bottom of the canoe.

Now that you are both back into the canoe, keep low. With one person moving at a time, work your way back to your seat. Once one person is in their seat then the next person will move slowly, keeping their center of gravity low, in order to get into their seat. Move slowly and be careful, you don't want to have to do this again.

Bail out your canoe—you do have a bailer, right? Or paddle to shore to remove any remaining water.

Canoe-to-Canoe Lift

If other upright canoes are available or the occupants are too tired to self rescue, then transfer the packs and paddles into a rescue canoe(s) and perform a canoe-to-canoe lift.

You can easily empty a canoe full of water while still far out on a lake. You should use this skill only in fairly calm, flat water. If done in slowly moving water, there should be no obstructions.

If you witness a canoe capsizing, you should first see to the safety and consciousness of the paddlers. In the process, if possible, rescue their paddles as well, since even a small current can quickly carry their gear away. You should always travel with a spare paddle lashed into at least one of the canoes in your group.

If you are close enough to communicate with them, tell them to hold onto their craft. Everyone should have lifejackets on, but if someone does not, get it on them.

As you approach the swamped canoe, be certain the wind, your speed or the current does not push you into the people in trouble. Keep back a slight distance until you have talked to them and are certain they will not try anything that will cause your canoe to swamp as well.

As you do the emptying, stay low in your canoe to stay balanced. Describe what you need from your partner and the swamped paddlers clearly.



Once the paddles and any gear from the swamped canoe have been stashed in the rescuers' canoe, set up the two canoes with the swamped one perpendicular to the center of the rescuers' canoe. The swamped canoe, even with a moderate amount of water in it, is now very heavy.

The two rescuers need to be facing each other near the center of the canoe. The person at the bow (front) slowly turns around to face the person at the stern (rear). As you change your position, it is not a good time to stand up and swamp your canoe. Roll the swamped boat upside down.

If the swamped canoeists are still both a little panicky, both can hold on to opposite ends of the rescuers' canoe to stabilize it. If at least one feels he/she can help with this process, they should go to the far end of the swamped canoe. They can push down on it to break the suction as the rescuers pull the end of the swamped canoe up onto the craft. Be sure to at least get a little of the swamped canoe up first, so as you drag it onto the upright craft it empties mostly into the water, not into the rescuers' craft. Aren't you glad you use dry bags for your gear?

The overturned boat is carefully slid up onto the rescuers' boat. The canoeist in the water can stay at the end of the overturned boat or go to the other end of the rescuers' canoe to help stabilize it. The two rescuers can't see each other as they slowly flip the previously swamped canoe over so they need to move slowly and communicate. At least one of the swamped canoeists should be paying attention to stabilizing the rescuers' canoe.

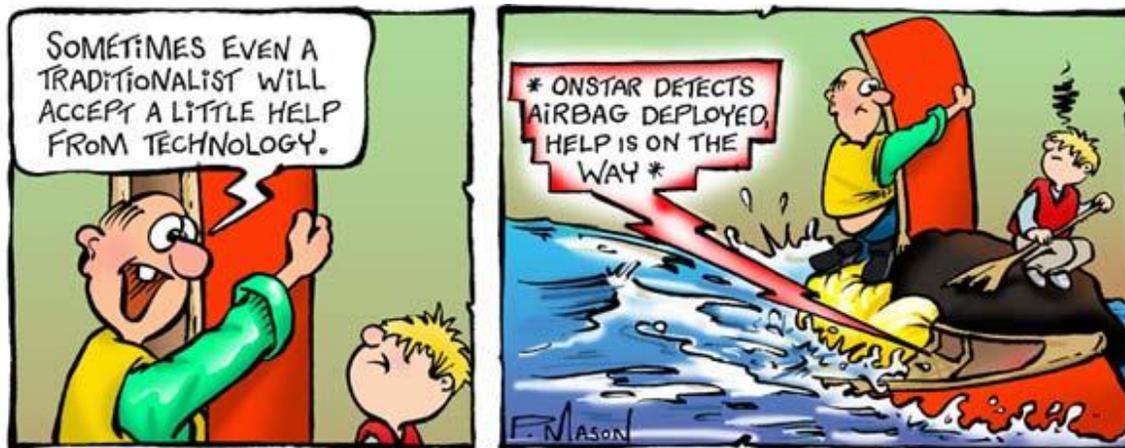


The now empty canoe can be slid back into the water and the waiting canoeists.



Put the two boats alongside each other to assist the canoeists in the water as they reenter their boat.

It is wise to practice these skills in advance of ever needing it during an emergency. During practice you can make mistakes that could be life threatening in a real situation. Practice is best in a pool, pond, or a lake cove with few waves.



Paddler's Safety Checklist

For Flatwater

- Remember to watch for water and weather changes – beware of fog
- Keep an eye out for other boat traffic
- Pay attention to all safety warnings
- Be sure you are visible
- Have emergency lights
- Keep your shoes on
- Remain prepared for an unanticipated swim

For Large Lakes

- Stay close to shore
- As you travel away from shelter, make sure you have the necessary skills to travel back
- Watch conditions for winds and fog
- Understand wave height, wind speed (Beaufort Scale), fetch and how it will impact your travel
- Stay aware of all boat traffic and traffic patterns
- Learn re-entry techniques BEFORE you need them.
- Know how to re-enter your boat and how to assist others back into their craft.

For Whitewater and Rivers

- Stay on the inside of bends
- Use adequate flotation in your craft
- Walk around low-head dams
- Watch for hydraulics. Looking downstream, if a hole is “smiling”, it is probably friendly. If it’s “frowning”, it is probably unfriendly.
- Beware of strainers! Strainers are fallen trees, bridge pilings, undercut rocks or anything else that allows the current to flow through it while holding you. Strainers are deadly.
- **If in doubt, get out and scout!**
- Avoid loose line entanglement
- Keep your group together

Key Tips

The above general practices will help you set off on the right course when packing and securing your gear in a canoe, but here are some key tips.

- Keep maps, routes, camping permits, and other paperwork handy and stored in a waterproof map case. Secure it to your seat, along with a compass, with some rope.
- If paddling solo, always keep a spare paddle within reach. Velcro straps or heavy duty elastic bands are two options that will secure the item, but will also let it break free with a quick pull.
- Always have water, sunscreen, bug repellent, a knife, and a flashlight within arm's reach.
- Bring a pair of padded, fingerless gloves to avoid blisters and keep your hands warm when paddling in the rain.
- Pack raingear on top - and outside - of plastic bags so you can easily access it when the skies open up.
- Knee pads will help keep your joints from getting stiff or sore from kneeling when paddling through rough water.
- If you plan on fishing, bring a clamp-on rod holder. If you're concerned about scratching your canoe, place a small piece of marine carpet over top of the gunwales first.
- Communicate with your paddling partner at all times.
- Invest in a properly fitting and comfortable PFD and wear it at all times.
- Once you have all your gear, there are some important tips for your time on the water:
- Load and unload the boat while it's in the water. This will be easier on you and the canoe. Make sure the load is balanced.

- Safely secure all of your equipment to the canoe. The exact way in which you do this may depend on the type of water you'll be paddling, and with what level of ease you want to be able to free your items from the canoe if you capsize. Be deliberate in your placement of items. Keep frequently used items handy and easily accessed.
- As a rule, the person in the back should be the more experienced, skilled canoeist. In the group of canoes, the most experienced boaters should be in the first and last canoes with the first aid equipment. Canoeing alone is not advised, and it is everyone else's responsibility to remain between the first and last boats.
- Stay low and steady in the canoe. Avoid making sudden movements and do not stand up. In rough waters, you can get down onto your knees for even greater stability.
- Canoe close to shore. Not only is this safer, it's where you'll find the most interesting scenery.
- Make sure to leave some space around your feet. If you capsize, you don't want your feet to become trapped, holding you underwater.
- If you capsize in a current, don't try to stand or put your feet down. If your foot gets caught in something, or between two rocks, the current can hold you down and drown you.
- If you capsize, stay with the canoe where it is safe to do so. In swiftly moving waters, you want to remain upstream of the boat. A canoe full of water can weigh as much as a car — you don't want to find yourself between a rock and that much weight.
- Of course, during the on-land portion of your trip you'll want to be low-impact campers. Pack out all of your garbage, do all of your washing (even with biodegradable soap) at least 200 feet away from the lake or river, and consider using a white gas stove or environmental stove instead of a traditional fire for cooking.

Paddling any waterway is a great way to experience the natural environment and adopt a slower pace to life, one more in tune with nature's rhythms. After successfully loading up your canoe, take your time and enjoy the journey!

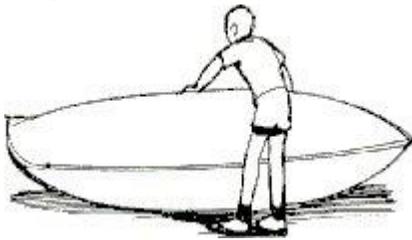


How to Portage a Canoe

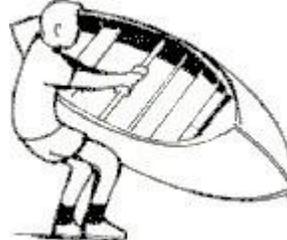
There are times you're going to have to portage, or carry your canoe from one lake or river to another. If possible, carry the canoe with someone else. One person can carry it for a little while, then, someone else can take it. It's actually easier for one person to carry the canoe on his/her shoulders than to share the load. Canoes with carrying yokes have been balanced to be carried by a single person.

The illustrations below demonstrate the best way to portage your canoe. If you have difficulty flipping the canoe up directly onto your shoulders, have a friend hold up the bow while you walk under and get your shoulder under the yoke (see **Two Man Lift** below). Set your canoe down gently at the end of all portages. Dropping your canoe can damage the hull and cause leaks. Always remember that your canoe is your only source of transportation in and out of the wilderness.

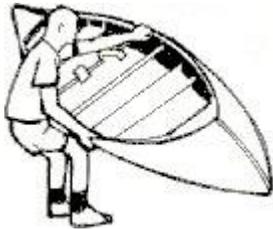
1. Tip canoe on its side.



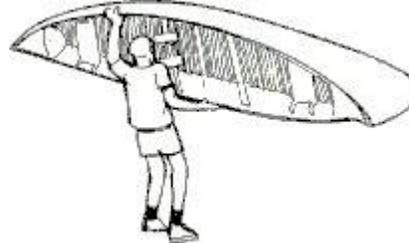
2. Place knees under canoe and raise to lap.



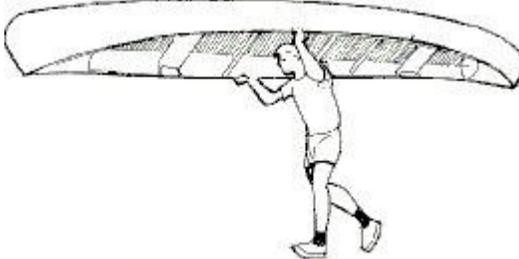
3. Grab thwart on far side with left hand.



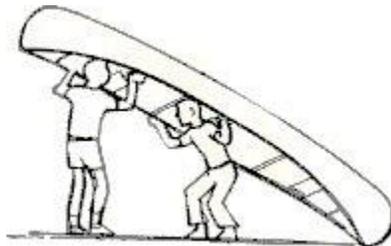
4. Lift canoe over as you raise it.



5. Drop the yoke on your shoulders.



Two Man Lift



"Wait until we reach shore. You're portaging too soon."

Canoeing Etiquette - The Finer Points

A good high adventure team is like a powerful, well-oiled, finely-tuned marriage. Members cook meals together, face challenges together, and finally go to bed together. A bad adventure, on the other hand, is an awkward, ugly, embarrassing thing characterized by bickering, filth, frustration, and crispy meals.

Nearly all bad adventures have one thing in common: poor behavior. This is true even if team members follow the stated rules, such as Don't Wear Muddy Boots into the Tent, Separate Fuel and Food, No Soap in the River, Wash your Hands Before Cooking, Don't Hit Me in the Head with Your Paddle, etc.

Unfortunately, too many rules of canoeing etiquette remain unspoken. Leaders seem to assume that their team members already have strong and generous characters like their own. But judging from a few of the boaters we've encountered, more rules ought to be spelled out. Here are ten of them.

RULE #1 Get your butt out of bed. Suppose your team members get up early to fetch water and fire up the stove while you lie comatose in your sleeping bag. As they run an extensive equipment check, pack gear, and fix your breakfast, they hear you snoring. Last night you were their buddy; now they're drawing up lists of things about you that make them want to spit. They will devise cruel punishments for you. You have earned them. The team concept is now defunct. Had you gotten out of bed, nobody would have had to suffer.

RULE #2 Do not be too cheerful before breakfast. Some people wake up perky and happy as fluffy bunny rabbits. They put stress on those who wake up mean as rabid wolverines. Exhortations such as "Rise and shine, sugar!" and "Greet the dawn, pumpkin!" have been known to provoke pungent expletives from wolverine types. These curses, in turn, may offend fluffy bunny types. Indeed, they are issued with the sincere intent to offend. Thus, the day begins with flying fur and hurt feelings. The best early-morning behavior is simple: **Be quiet.**

RULE #3 Do not complain about anything, ever. You are cold and wet, visibility is four inches with wind driven sleet granules embedding themselves in your face like shotgun pellets, mosquitoes and black flies are sucking one quart of blood per hour, and the day's route includes a five mile portage of your canoe and gear. Must you mention it? Do you think your friends haven't noticed the conditions? Make a suggestion. Tell a joke. Lead a prayer. Do not lodge a complaint. If nothing can be done to correct the situation there is no point to complain. Whiners are generally drowned on the spot and those that survive are not invited back.

RULE #4 Learn to cook at least one thing right. One expedition trick is so old that it is no longer amusing: on the first cooking assignment, the clever cook prepares a dish that resembles, say, Burnt Sock in Toxic Waste Sauce. The cook hopes to be relieved permanently from cooking duties. This is the childish approach to a problem that's been with us since people first started throwing lizards on the fire. Tricks are not a part of a team spirit. If you don't like to cook, say so. Offer to wash dishes and to prepare the one thing you do know how to cook, even if it's only boiled water. Remember that talented camp cooks sometimes get invited to join major expeditions in Nepal, all expenses paid.

RULE #5 Either A) Bathe, or B) Accept an unflattering new nickname. After a week or so in the backcountry, without bathing, hair forms angry little clumps and wads and the body odor is extreme. This leaves the person looking and smelling like an escapee from the basement of a mental ward outhouse. Such an appearance could shake a team's confidence in your judgment let alone your tentmate's willingness to share space with you. If you can't bathe, be prepared for others to do it for you when you least expect it.

RULE #6 Do not ask if anybody's seen your stuff. Experienced canoers have systems for organizing their gear. They very rarely leave it strewn around camp or lying back on the riverbank of your last stop. One of the stupidest things you can do is ask your tentmate if they've seen the tent poles you thought you packed 15 miles ago. Even in the unlikely event you get home alive, you will not be invited on the next trip. Should you ever leave the tent poles 15 miles away, do not ask if anybody's seen them. Simply announce, with a good-natured chuckle, that you are about to set off in the dark on a 30-mile canoe trip to retrieve them, and that you are sorry. Also, it's unprofessional to lose personal items such as your spoon or your toothbrush. If something like that happens, don't mention it to anyone.

RULE #7 Never ask where you are. If you want to know where you are or how much farther the destination is, look at the map. Don't verbalize your question. Everyone is encouraged and welcome to participate in the evening or morning route planning sessions, or you may want the challenge to try to figure it out yourself. Go for it. If you're still confused, feel free to discuss the identity of landmarks around you and how they correspond to the cartography. But if at some point you: A) suspect that a mistake has been made, B) have experience in interpreting topographical maps, or C) are certain that your group leader is a novice or on drugs, speak up. Otherwise, follow the group like sheep.

RULE #8 Always carry more than your fair share when portaging. When the trip is over, would you rather be remembered as a stud or a sissy? Keep in mind that carrying the canoe more than halfway on a portage won't kill you. In any given group of flatlanders, somebody is bound to try not carrying their fair share; usually by stating that their back is sore or their shoulders hurt. When an argument begins, take the canoe the whole way yourself. Then shake your head and gaze with pity upon the slothful one. This is the mature response to childish behavior. After the portage is complete and the canoe is reloaded, contrive a strategy to leave the offender on the shore and let them walk the rest of the way.

RULE #9 Do not get sunburned. Sunburn is not only painful and unattractive. It's also an obvious sign of inexperience. Most newbies wait too long before applying sunscreen. Once you've burned on an expedition, you may not have a chance to get out of the sun. Then the burn gets burned, skin peels away, blisters sprout on the already swollen lips. Anyway, you get the idea. Wear SPF 30 protection. It gives you just about 100% protection. It does get on your sunglasses, all over your clothes and in your mouth. But that's OK. Unlike sunshine, sunscreen is non-toxic.

RULE #10 Do not get killed. Suppose you successfully canoe down a flooded Colorado River in the Grand Canyon, without a wetsuit, and finish by saving the lives of three other canoers. Pretty macho, huh? Suppose now that you take a vertical detour over a waterfall and never make it back to civilization. Would you still qualify as a hero? And would it matter? Nobody's going to run any fingers through your new chest hair. The worst thing to have on your outdoor resume is a list of the possible locations of your bloated, fish nibbled body. Besides, your demise might distract your team members from enjoying what's left of their vacations.

All canoeing etiquette really flows from this one principle: Think of your team, the beautiful machine, first. You are merely a cog in that machine. If you can't think about others first, forget about joining the high adventure. Your team will never have more than one member.



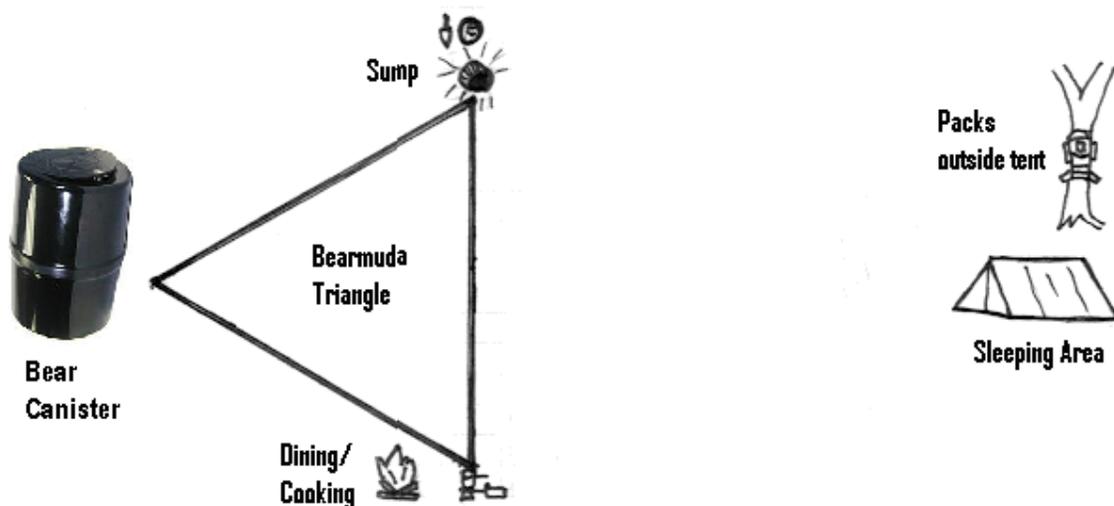
“How come every time we go canoeing,
you lose your paddle?”



Camp Layout and Setup (Bearmuda Triangle)



The primary objectives of laying out camp are to find a safe sleeping area and to leave as little trace that you were there as possible. This means respecting wildlife that might be interested in your "Bearmuda Triangle" and insuring that you don't contaminate ground water or leave anything behind. The Bearmuda Triangle is formed by the (1) the fire ring & cooking (dining), (2) the bear canister, and (3) the sump (cooking wastewater) "smellable/bear areas". The Backpacking Equipment List indicates which items are stored in the bear canister [BC] and sump or dining areas [SD]. The tenting area should be safely outside this triangle because animals are likely to travel between these areas, and scouts don't want to be in their path. To prevent being a bear lollipop, no food should EVER be in the tent, packs (with cover) should be hung outside, and a sleeping bag stuff sack or tent bag NEVER used as a bear bag. Shoes should not be left on the ground. Actually, in the mountains, bears are not the only "critters" to guard against. Scouts may encounter raccoons, porcupines and skunks. All are attracted to smells or salt and can "maul" a pack. Below is a simple illustration of an appropriate camp layout.



Hey! If you think this is being overly cautious or want to read more, check out the National Park Services (NPS) Bears and Leave No Trace pages, the USDA Forest Service (USFS) Outdoor Fire Safety Tips and USFS -- Safe Campfires pages, a Philmont Guidebook to Adventure (PHL) or the "Wilderness Use Policy of the Boy Scouts of America" (WUP). Since good safety procedures are pervasive, it's not surprising that they agree in almost every aspect. Here are a few guidelines from these sources:

Cooking and Fires -- It is the cooking - dining - fire corner of the bearmuda triangle that often ends up closest to the tenting area. Food spills occur and they must be cleaned up by treating the spill like any other food -- putting it in the "yummy" bag and packing it out. Lightweight fueled stoves are more efficient and faster for cooking than fires, and they leave minimal impact. Always read and follow instructions provided by the stove manufacturer. Cool stoves before refueling, refuel them and store fuel away from where the stove will be lighted or used. Let any spillage dry before lighting. Never use stoves inside a tent. Open fires are usually discouraged, and sometimes prohibited. However, when a fire is built, **always check for and follow local regulations.**

- Fires should not be built near overhanging branches, slopes, stumps, logs, dry grass, leaves or firewood. Use an existing fire ring if available. Otherwise, dig a fire pit about six inches deep, keeping the sod intact for replacement. Scrape away any burnable material within 10 feet.
- Have plenty of water handy and a shovel for throwing dirt on the fire.

- Keep the fire small to reduce impacts and the danger of a wildfire. Start with dry twigs and small sticks, followed by larger sticks and logs, pointing them toward the center to be gradually pushed in. Burn dead and down wood only and only that which is necessary.
- Be sure your match is out, holding it until it is cold, and then break it so that you feel the charred portion.
- Never leave a fire unattended, even for a few minutes.
- Allow the fire to burn down to white ash; do not try to put a fire out by scattering it. Drown the coals thoroughly with water, stir the remains, drown it again, and stir again (where water is scarce, damp dirt and sand may also be used).
- Feel all materials with your bare hand to make sure it is "dead out". Make sure that no roots are burning. Do not bury coals--they can smolder and break out.
- Only after the fire is definitely dead out, accumulated ash from the fire pit is scattered away from camp.

Bear Canisters – In many areas where bear-human conflict repeatedly occurs, use of bear-resistant containers has been made mandatory. When the prize is your food and the setting is the wilderness, never bet against the bears. "You can't count on food being safe if you put it in a nylon sack and hang it in a tree overnight," says Harold Werner, Fish and Wildlife Biologist at Sequoia and Kings Canyon National Parks since 1980. "If you've never lost food by counterbalancing (suspending 2 bags of food high on a tree branch), it's only because you're lucky, no matter how well you do it." Too many campers and backpackers have learned this lesson the hard way. Resourceful black bears, driven by a powerful sense of smell (100 times stronger than a dog's), have become some of the cagiest, most determined creatures on earth when it comes to snitching food from humans. Increasingly drastic measures are needed to protect your food in some North American wilderness areas—and to protect bears from being put to death when their desire for human food makes them too aggressive. Other than standing guard by your trail mix all night, the preferred solution is to store food inside a bear-resistant container.

Bears: Smart, Motivated, Relentless

Black bears have become "habituated" to human food. That means once they get a taste of it, bears want more of it—lots more—and will do just about anything to get it. They often succeed. Why? Because of the bear's brute strength, persistence, surprising ingenuity and, crucially, the lackadaisical food-storage practices of humans. Wildlife managers remind us that such a dilemma is not a "bear problem." The real problem occurs when humans take a casual, indifferent approach to storing food.

A bear's food-stealing repertoire includes:

- Bashing windows of locked vehicles to get to food coolers (which bears have grown to visually recognize and associate with food). Bears have broken open vehicles just because a soda can or gum wrapper was left visible. (Solution: Don't leave such items inside a vehicle, or at least conceal them thoroughly—only if no other food-storage options are available.)
- Breaking the rear windows of cars, then clawing through the back seats in order to get at aromatic items locked in trunks. (Solution: Remove food from a vehicle when you park; store it in a bear box if available.)
- Sending cubs up trees to dislodge nylon food bags dangling from limbs. (Solution: Use a portable, bear-resistant food container.)
- Gnawing through limbs several inches thick to make suspended food bags drop. (Solution: Same as above.)



"I've never seen it myself, but I've heard that some bears will walk out on a branch and make Kamikaze jumps at food bags to bring them down," says Michelle Gagnon, a bear technician at Sequoia/Kings Canyon since 1996. "I believe it. You can see blood on the branches they've chewed through to make bags drop. They'll actually hurt themselves to get at food."



Packing a Bear-Resistant Food Canister

With forethought and planning, it's amazing how much food you can fit into a canister. If you choose the right foods and repackage them into baggies or small containers, you can maximize canister space. By measuring out every meal, you can make sure you are not packing more than you need. Who wants to pack out leftovers? It takes a little effort and time but the results are rewarding. Remember, when you are using a canister ALL scented items – food, toiletries and garbage – must fit inside the canister *throughout your entire trip unless you are in attendance or actively preparing your food*. At the trailhead, make sure that ALL food, trash, toiletries and scented items will fit inside the canister the first night. Carry the first two meals outside of the canister: lunch and dinner.

Food Choices – Choose foods that are compact, compressible and high in calories. This includes rice, tortillas, jerky, flat pastas, dehydrated powders, nuts, dried fruits, peanut butter, candy and nutritional bars. You are trying to put as much food in the canister as possible so think about volume when you purchase food. For example, instead of bread rolls, buy tortillas. Instead of macaroni, choose spaghetti. You get the picture - don't waste space on bulky food items.

Plan Your Menu – Carefully count every meal that you will be eating. By doing this, you will save weight and space. Put all the food on a table and plan each meal, snack, drink and condiment. Pre-measure and pre-mix your food.

Repackage Your Food – Take food out of its original package. This allows you to fit more food inside a canister and reduces the amount of garbage you generate. Repackage food from boxes, bottles, jars and cans into resealable plastic bags. These bags are flexible and fit into small spaces. Force air out of packages. Poke tiny holes in freeze-dried packages to release the air. Save instructions for cooking and put inside meal bags. Write food contents on outside of bags with a permanent marker.



Toiletries – Pack toiletries similarly to foods. **Put toothpaste, soap, sunscreen, bug repellent, etc. into small containers.** Stores sell small, lightweight plastic containers that work well for this. Don't take more than you need.

Benefits of Using a Canister

- Less stress, increased peace of mind
- More time at camp to relax instead of thinking of ways to store food
- Guaranteed food supply if bears or other animals visit your camp
- No aborted trips because bears ate your food

- Freedom to camp anywhere: above tree line or away from food storage lockers
- No need to search for the right tree or carry ropes and food sacs for counter-balancing
- More time at camp to relax instead of thinking of ways to store food
- A small table to use, something to sit on
- Increased safety for you and protection of wild animals

Place ALL food and scented items in a canister at least 50 feet from your tent (downwind if possible) in a depression or between rocks or logs so it cannot be rolled away. Leave the canister on the ground. Do not hang the canister from a tree. A bears' curiosity may attract them to any odor, even if it isn't food-related; so all "smellables" go in the canister. Avoid contaminating sleeping gear with food odors. Do NOT use sleeping bag stuff sacks, tent bags, or clothing bags for food/smellables storage. NEVER eat or keep any food, or anything that held food, in your tent because the odor will linger (that means your backpack too!!). Do NOT sleep in clothes with food odors; they should be hung like food. Keep separate clothes inside your sleeping bag just for that purpose and only those clothes and boots remain in the tent.

Tenting -- Pitch tents on high ground where they will not damage vegetation and do not dig trenches around them. Be careful not to camp too near to streams that could rise in a flash flood -- where the valley is narrow but drains a large area. Although you want to avoid low ground, you may want to avoid the tops of bald hills when there is the possibility of lightening.

Sleeping inside a closed tent is preferable because it puts a barrier between you and rodents or other animals that may carry and transmit diseases and insects whose bite hurts or may stimulate an allergic reaction (insect repellent should be used sparingly in the evening because it is a "smellable"). Rodents are a problem at many camping shelters/grounds, because of the attraction of food remnants. Hantavirus pulmonary syndrome infections from Washington to Florida, California to New York have been linked to rodent bites and droppings. Ticks may transmit Lyme disease. Rodents are a primary food source for snakes, which are known to snuggle up to warm objects. Reportedly, a lady hiking the Appalachian Trail awoke one morning to a tickle on her tummy, only to find that a Copperhead had crawled into her sleeping bag with her to take advantage of the warmth on a cool night. Most modern tents have good ventilation when the rain fly is left off on warm dry nights.

Every scout should follow procedures based upon Federal, State and Local Laws/Regulations and Boy Scouts of America publications covering that particular trek/tour. If you aren't following safety precautions, and insisting that those with you do, you are putting yourself, those around you, and those that follow you, at risk. A scout would not knowingly do that! We are responsible for "knowing".

The "Wilderness Use Policy of the Boy Scouts of America" charges us to

- Conduct pre-trip training that stresses proper wilderness behavior, rules, and skills for all the potential conditions that may be encountered", to
- Treat wildlife with respect and take precautions to avoid dangerous encounters with wildlife", and to
- Emphasize the need for minimizing impact on the land through proper camping practices ..."

Increasing the "knowing" part is a major motivation for this packet.



Water Treatment Basics

You can rack up quite a thirst while hiking or canoeing, but you don't want to be drinking water out in the woods without doctoring it up some. Yes, the good old boys in the old Westerns used to sip from the creek when thirsty (unless of course there was a skull nearby), but like a lot of movie stuff, don't try that at home – or at camp. Instead of bringing gallons of water with you on a trip, a backpacking water treatment method allows you to safely use water available to you on the trail. This is really helpful because staying hydrated is vital. And carrying all your water for more than a day trip would be heavy and cumbersome.

Today's natural water sources are nearly always home to such invisible characters like *Giardia lamblia*, *Cryptosporidium*, and other nasty "bugs". Generally, these protozoa and bacteria and viruses won't kill you, but just make you wish you were dead before they run their course – run being the operative word here. Where did these nasties come from? The worst come from mostly other people, or rather their feces to be more exact, but animal feces cause problems too – so sipping from the creek 100 years ago was still a risky proposition. Since you can't tell if water is safe to drink just by looking at it, the best idea is to use something that will eliminate harmful or undesired pollutants. You really don't want to spend your backpacking trip battling diarrhea, nausea, cramping or worse, all because you drank untreated water.

There are four main ways to treat water: chemicals, heat, UV radiation and filtration.

Chemicals – Iodine and chlorine are two common chemicals used to treat water. Referred to as halogens, they are able to kill bacteria and viruses, but are not able to kill all protozoa. This type of backpacking water treatment is inexpensive, light and easy to pack. On the downside, the chemicals can make water taste bad unless a neutralizer or flavoring agent is used. Furthermore, chemicals can take a while before they have effectively treated the water. Chlorine usually takes longer, which is why iodine is a more popular choice. However, some people are allergic to iodine and it is not recommended for use by pregnant women or people with thyroid issues.

Heat – Boiling water is a highly effective way to kill protozoa, bacteria and viruses. Boiling water renders all organisms ineffective. However, you don't necessarily need to bring water to a complete boil to treat it. Heating water to 149°F (65°C) for 5 minutes will kill 99.99% of all harmful organisms. While you need a thermometer to gauge this, it allows you to use less fuel and time in order to prepare your water than if you brought it to a complete boil. Drawbacks include needing a stove, fuel and time. Boiling water also doesn't remove sediment, so you may want to run the water through a coffee filter if it's dirty.

UV Radiation – The use of ultraviolet rays to fight bacteria, protozoa and viruses, is a more recent backpacking water treatment. The UV rays damage the microbes DNA, rendering them unable to replicate and multiply. These devices are simple, effective and fairly quick to operate. Downsides include the fact that they are battery operated, expensive, and less effective on cloudy or murky water and require additional filtration to remove sediment. However, some do come with their own filtration attachment.

Filtration – Using a filtration system forces water through a finely porous internal element within a filtering unit. They can be a speedy way to filter water compared to other options and, depending on how the filter is designed, can eliminate bacteria, protozoa, viruses and sediment. This is the most commonly used backpacking water treatment method.

However, not all filters are created equal and therefore do not all eliminate the same contaminants. Unless it has a purifying system included, which adds to the cost, it will not kill viruses. Drawbacks include the cost, weight, maintenance and sometimes they can be difficult or tiresome to operate.

The Water Filter Explained

Picking out a water filter can be a bit daunting. Here is a helpful overview about water filters, how they work and what to look for when buying one. It is important to clarify some terminology you might come across in your research. There is a difference between a water filter and a water purifier. In simple terms, a filter does not remove or destroy viruses, while a purifier does. A filter allows water to pass through an internal device that has many, many tiny holes. And we're talking tiny. These holes are measured in microns. As the water passes through these holes, the filtration system catches and removes organisms and debris

from the water. If the water filter is also a purifier, there will be an additional chemical or electrostatic process that renders viruses inactive.

What to Look For:

Filter Type – This is referred to as the cartridge. It is the internal device that filters out organisms and debris. There are different types of filter cartridges, such as ceramic or fiberglass. Their construction can affect the quality and price of the filter. Some can be cleaned and reused, while others must be replaced. Although the initial cost might be more, a filter that can be cleaned easily and reused is much more efficient in the long run.

This is also where the purification system will be if your filter also purifies water. Pay attention to the internal components of a filter. Some purification systems use an iodine resin. If you are pregnant, have thyroid issues or are allergic to iodine, such a system should be avoided.

Pore Size – The pores that allow water to pass through and filter out organisms vary in size. When looking at a backpacking water filter, you will see the terms “absolute pore size”, “nominal pore size” and “average pore size.” You want to pay attention to the absolute pore size. Absolute pore size is the size of the largest particle that can pass through. Pick a filter that has an absolute pore size of at most 0.2 microns, as this is the standard for the smallest of microorganisms.

Cleanability – As a filter is used, the organisms and particles it removes remain in the filter. This can cause clogging and make the filter work slower. A filter that allows you to remove and clean the cartridge in the field is very handy.

Life Expectancy – How frequently you enter the backcountry will determine your needs, but the longer a water filter can last between cleanings or replacements the better. Usually manufacturers will list approximately how many liters of water can be filtered before maintenance is required. Remember that this number can change depending on the quality of water you’re filtering.

Pump Force/Pump Strokes – If you are looking at a hand pump operated filter, pay attention to the pump force and pump strokes. Pump force tells you how many pounds of force are needed per stroke. The higher the number, the more of a workout you’ll get when filtering your water. Pump strokes tell you how many pump strokes are required per liter of water. This gives you an idea of how effective each pump action is and will also give you an idea of how hard you’ll have to work to filter your water.

Output – This number tells you how many liters of water can be filtered per minute. This is an estimate of course, but it gives you a good idea of how long it will take to filter your water. This number will change with each use as the filter becomes increasingly clogged.

Weight – It’s good to pay attention to how much a backpacking water filter weighs. They can easily weigh over a pound and you don’t want to get one that will add too much weight to your pack.

Tips On Treatment

Water filters are like a vacuum cleaner – they get clogged if you don’t clean them. Most filters have a replaceable element. Unless you’re pumping many, many gallons of water you should not have to worry about clogging a filter under normal water conditions. But, muddy water will reduce the cartridge life span. To extend cartridge life, always use the best water source available. In heavy sediment conditions, wrap a coffee filter or bandana around the intake bulb with a rubber band. Where possible, place untreated water in a container and wait for sediment to settle out and the water appears clear; then filter from water above the sediment. If the handle becomes very hard to pump, the filter cartridge may have become clogged. As a temporary solution in the field, remove the cartridge and swish it around in water. Do not allow contaminated water to enter the cartridge output barb. This will usually provide enough additional cartridge life to complete your trip.

Another tip may seem counterintuitive – pump your water from still, rather than running sources. Sure, the running creek water looks cool, clear and inviting, but the churning water leaves various nasties suspended within it. Pooled water, on the other hand, gives the chemicals and heavier particles a chance to settle to the bottom – that further reduces the likelihood of something bad getting through to your stomach.

As you pump water, or storing the filter in its bag between loading sessions, be careful not to let the intake filter or water dripping from it contaminate the outlet hose or cap that goes into your water bottle or bladder. If it does, be sure to rinse it off with filtered water before using again. Take a small baggie to wrap around the outlet cap with a rubber band when not in use. Finally, watch for contamination potential within your water bladder or container between uses or refills. Various bad things can start to grow with just a few drops of stale water left alone for a few days. Let the container air dry completely between uses. Sanitize by adding a capful or teaspoon of bleach to enough water to fill the reservoir. Allow to bleach for an hour to overnight. Rinse very thoroughly with 4 or more changes of water. This is the best way to kill fungus and bacteria, especially if you see visible growth. To remove the chlorine taste after bleaching the bladder, fill the bladder, add 1 tablespoon of vinegar and shake it, then add 1 tablespoon baking powder then shake it. Now drain and rinse thoroughly.

Additional Backcountry Water Tips

- Avoid using water where there is obvious animal activity. Though they can be cute, animals are carriers for organisms you want to avoid.
- Avoid water near highly trafficked human activity. Move upstream from campsites, trail crossings, outhouses, etc.
- Avoid water that is downstream from factories, plants, mines, largely populated areas, etc. as the water could be contaminated by chemicals.
- Try to draw water from a still, clear source. In still water, many organisms sink to the bottom and can be avoided. Avoid stagnant water however, as harmful algae can reside in it.
- Never collect water from a source that has dead animals in or around it.
- Snow and ice can be used, but remember that freezing does not kill bacteria. A backpacking water treatment is still necessary. Avoid snow with a pink tint to it as it may have algae. And avoid yellow snow for obvious reasons.

How Much Have You Had To Drink?

So if you now have safe water to drink from filtering or other treatment, how much do you need? At home, the average person uses maybe 80 gallons a day, so obviously something has to give when you're out in the woods. OK, so you're not flushing or showering, or watering your lawn, or washing your car, but that still leaves a lot of water to account for.

You can figure going through at least a gallon a day per person in moderate weather and exertion conditions; 2 gallons a day when it's hot.

You can carry water in 16- to 32-ounce bottles of various shapes and sizes on short day trips, or on longer trips move up to water bladders that will hold up to a gallon of water with drinking tubes you can sip from as you hike. Collapsible water containers filled prior to departure can provide the first few days of water. This is great for canoeing trips but is not practical for hiking due to the amount of weight involved.

One helpful precaution is to start out your day fully hydrated. Drink a lot before heading out for the day – your body will appreciate it, and it's that much less you'll have to filter or carry during the day. How do you know how much water is enough? As a general rule, drink before you become thirsty; it seems the thirst mechanism is behind the body's actual need for water. It's somewhat like your car's red engine light – by the time it comes on, something has already been wrong for awhile. Drink as you go. Also, check out the color of your urine – if it's clear, you're probably well hydrated. If it's dark yellow, it means you need some more water inside you - drink up!

Sanitation

Dishes -- Scrape off food scraps and seal them in an airtight plastic bag ("yummy bag"), store it with other food, and pack it out. Under no circumstances should food scraps be buried! Discarded or buried food scraps attract animal life. It is common to see chipmunks, ground squirrels, and various species of birds gathering around camp kitchens. These "camp robbers" have become attracted to campers as a food source. Human food is not natural to wild animals, and their natural feeding cycles and habits become disrupted when they are fed by humans. A conscientious no-trace camper always keeps and leaves a clean camp. Use a scrub pad to remove tough "cooked-on" parts. Once all visible food is removed, wash dishes at least 200 feet from water sources. If soap must be used, use biodegradable soap. Leave No Trace principles discourage campers from using any soap, if possible, because even biodegradable soap will contaminate fresh water if precautions aren't taken. Rinse dishes, pots and utensils in boiled or filtered water. Everything should be left to air-dry (even if "towel-dried" first) in the sump or dining area. These procedures guard against inadvertently contaminating your pack or its contents. Proper washing and rinsing will prevent diarrhea, dysentery and other ailments. Anyone who has suffered from these on a backpacking trip takes cooking cleanup vveerrrry seriously! Strain dishwater through a small strainer or bandana. Put the food particles in a sealable plastic bag and pack them out. Broadcast the strained dishwater over a wide area at least 200 feet from the nearest water source, campsite, or trail. Scattering dishwater in a sunny area will cause the water to evaporate quickly, causing minimal impact. You should not wash dishes near a water spigot because of possible contamination of ground water. Don't throw food, scraps or garbage/trash into "pit" toilets [ones which just use a hole in the ground], nor bury it, because bears and rodents will easily retrieve it. Do not burn trash, scraps, or garbage, pack it out. Any food falling into the fire must burn to ash or be removed and packed out. A bear drawn to a camp by the smell of buried food scraps or garbage in the fire pit may begin to associate food with people, a lesson it will remember all its life. Then they have to be killed. As they drill into scouts at Philmont: *"Feed a bear - Kill a bear"*.

Bathing and Laundry

Do not bathe or do laundry in or near a stream. Instead, use biodegradable soap and a shower or wash bag at least 200 feet from the nearest water source, campsite, or trail.

Human Waste

Proper disposal of human waste is important to avoid pollution of water sources, avoid the negative implications of someone else finding it, minimize the possibility of spreading disease, and maximize the rate of decomposition.

If an outhouse or bathroom is available, use it. In most backcountry locations, burying human feces in the correct manner is the most effective method to meet these criteria. Solid human waste must be packed out from some places, such as narrow river canyons. Land management agencies can advise you of specific rules for the area you plan to visit.

Contrary to popular opinion, research indicates that burial of feces in soil actually slows decomposition. Pathogens have been discovered to survive for a year or more when buried. However, in light of the other problems associated with feces, it is still generally best to bury it in humus (decomposing plant or animal matter that forms organic soil). The slow decomposition rate emphasizes the need to choose the correct location, far from water, campsites, and other frequently used places.

Catholes are the most widely accepted method of waste disposal. Locate catholes at least 200 feet (about 80 adult steps) from water, trails, and camp. Select an inconspicuous site where other people will be unlikely to walk or camp. With a small garden trowel, dig a hole in humus that is 6 to 8 inches deep and 4 to 6 inches in diameter. Cover and disguise the cathole with natural materials when finished. If camping in the area for more than one night, or if camping with a large group, widely disperse cathole sites.

Use toilet paper sparingly and use only plain, white, nonperfumed brands. Toilet paper must be disposed of properly! It is now a requirement in many wilderness areas to place used toilet paper in plastic bags and pack it out, which is the best way to practice Leave No Trace. Never burn used toilet paper. Used toilet paper does not burn well (I wonder why?) and you increase the danger of starting a wildfire.

The best toilet paper for backpacking may actually be paper towels. Regular toilet paper just doesn't stand up to the humidity and shreds too easily leaving Klingons (not the Star Trek variety). Brawny paper towels are great to use because they're scored down the middle of each sheet to make it easy to tear off a half sheet. In packing toiletries for a trip, tear off five half sheets for each day. Cut each half sheet in half again, producing ten quarter sheets for each day.

Pack ten quarter sheets in a quart Ziploc bag along with a wag bag (the bags people use to put pet feces in) and one individually wrapped antibacterial moist wipe such as “Wet Ones”. Make sure to get the unscented moist wipes to avoid attracting bears. Prepare a quart bag for each day to be spent in the backcountry along with one extra. Place these prepared quart bags along with a gallon Ziploc bag inside of a second gallon Ziploc bag. Don’t forget to include a small bottle of hand sanitizer.

The moist wipes serve two functions. They contain aloe which can be soothing when necessary and they can help ensure that your butt crack is clean. Monkey butt (diaper rash) can become very painful if you are hiking long distances over multiple days. The best cure is prevention. If that fails, break out the medicated Gold Bond and use liberally (if you are tough enough).

When nature calls in the backcountry, dig a cathole in an appropriate site and make your fecal deposit in the hole. Clean yourself with the contents of one of the quart Ziploc bags. Paper towels are biodegradable, but don't bury them in a cat hole or drop them in a composting privy. Pack out the used towels and Wet Ones in a wag bag sealed inside of the quart Ziploc bag. Place the quart bag in the separate gallon Ziploc bag (you should only need one for a seven day trip). Finally, cover and disguise the contents of the cathole and use the hand sanitizer to thoroughly clean your hands. The most common cause of diarrhea in the backcountry is poor hand sanitation, not what was ate.

Urine has little direct effect on vegetation or soil. In some instances urine may draw wildlife that is attracted to the salts. As a result, wildlife may defoliate plants and dig up soil. Because urine has an objectionable odor, be sure to urinate at least 200 feet from water, campsites, or trails. Urinating on rocks, pine needles, and gravel is less likely to attract wildlife.

Waste Disposal

Dispose of waste properly. Pack out what you pack in. This common saying is a simple yet effective way to get backcountry visitors to take their trash home with them. There is no reason why people cannot carry out of the backcountry the extra food and packaging materials that they carried in with them in the first place. Trash and litter in the backcountry ranks high as a problem in the minds of many backcountry visitors. Trash and litter are human impacts that can greatly detract from the naturalness of an area.

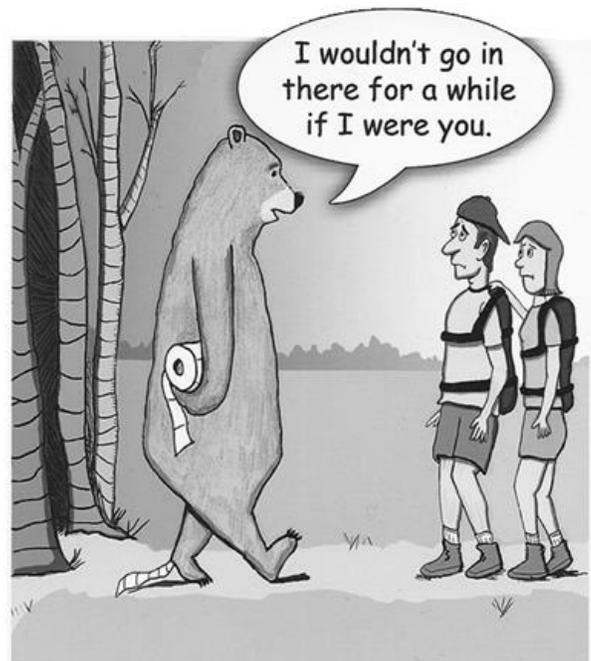
Reduce litter at the source. Much backcountry trash and litter originates from food items. Perhaps the easiest way to practice the principle of – *pack it in, pack it out* – is to follow the principle of *planning ahead and prepare*. It is possible to leave most potential trash at home if you take the time to properly repackage food supplies. Reduce the volume of trash you have to pack out. Save weight by repackaging solid foods into plastic bags and liquids into reusable containers.

Your first preference for dealing with trash should be to pack it out. Most trash will not be entirely consumed by fire and conditions frequently make fires unacceptable. Areas are often closed to fires because of high fire hazards or excessive campsite damage. Some areas, such as desert settings, are impractical for fires because of the scarcity of firewood.

How Long Does It Last?

Packing out trash is increasingly important as greater numbers of people visit the backcountry. Here are some estimated life expectancies for different kinds of litter:

- Paper: two to four weeks
- Rubber boot sole: 50 to 80 years
- Banana peel: three to five weeks
- Tin can: 80 to 100 years
- Wool cap: one year
- Aluminum can: 200 to 400 years
- Cigarette butt: two to five years
- Plastic six-pack holder: 450 years
- Disposable diaper: 10 to 20 years
- Glass bottles: Thousands or millions of years
- Hard plastic container: 20 to 30 years



Keeping Moisture Out and Letting It Out

Top Ten Ways to Keep From Getting Wet:

1. Get in out of the rain.
2. Drink from a cup, never from a water fountain.
3. Stop crying; laughing too hard is risky too.
4. Don't walk near water puddles and creeks.
5. Never break a sweat; don't hike.
6. Go to the restroom.
7. Don't wash your hands or take a bath.
8. Don't visit Old Faithful or other geysers.
9. Never coach a winning football team and, even if you coach a losing one, watch the Gatorade bucket.
10. Stay home, under a new roof, on a hill, in a desert.

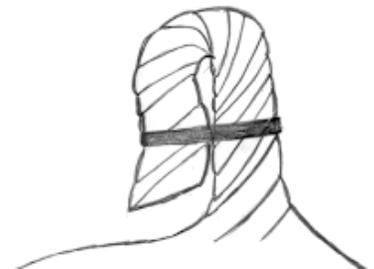


Otherwise, you might consider some bits that following.

Seriously, one of the most perplexing problems for newbies is keeping things dry -- both themselves and their gear. One common fallacy is to seek the "ONE" solution to this problem rather than to think in terms of redundant moisture barriers. What is described below is a system of redundant steps to keep things dry. For example, the combination of properly fitted pack cover, water resistant pack fabric, and waterproof packaging provides good assurance against moisture spoiling packed gear. Redundancy may add some weight, but plastic bags, the usual efficient solutions, are light in weight relative to other gear -- and a lot lighter than water soaked gear. Additionally, redundant bagging is good storage for those "extra" bags packing lists usually call for. When not needed, they provide security. When needed for alternative uses, you rely upon the primary system. A useful mental exercise is to imagine your pack dropped into a creek and which of the contents would still be usable afterward. Weight conscience backpackers, after gaining experience and confidence in their "primary system" procedures and packing abilities, can peel selected redundancies off on less crucial gear -- but not from your sleeping bag. You can be comfortable for a long time under adverse conditions with just a water- diverting canopy (dining fly, tent fly, military poncho) and a dry sleeping bag to keep you warm and cozy. Without it, before very long, you are miserable and risk hypothermia. **DON'T TAKE CHANCES WITH KEEPING YOUR SLEEPING BAG DRY.** As an additional precaution, it is recommended that newbies use synthetic-fill bags, so that they can recover quickly if they do falter.

Things to consider about moisture (getting wet) while backpacking:

- **Packaging in waterproof (Ziploc) bags.** Packing several small similar items together in heavy plastic (Ziploc) bags organizes items that could get "lost" inside the pack and keeps the contents dry even if the pack gets soaked. When clothes and other pliable material are rolled tightly and placed in these bags they become more rigid, less spacious and waterproof. If you sit on the bag while zipping the lock, when you get off it will have that "vacuum-sealed" look, be less "puffy", and store in about half the space. This is your primary defense if your pack does drop into a creek and you hope to use the contents afterward.
- **Gooseneck closure.** Goose necked heavy plastic bags should be used for items that must be kept dry but are too large for Ziploc bags, like a sleeping bag. The gooseneck closure is formed by twisting the bag end, folding it over, then fastening it in place with a rubber band or twine. Note that, unless the bag is completely submerged, water would have to run uphill to get in. If a stuff sack lined with a plastic bag is going to be compressed further using webbing straps & buckles and the gooseneck twist is wound real tight, a small pin hole in the bag may be necessary to allow the air to escape unless the compression is done in slow incremental steps.
- **Raingear (for you).** It should be "vented", or else the moisture you avoid from outside will be replaced by moisture from your body that can't escape. Traditional raingear includes mesh vents protected by overhanging flats across the back and under the armpits. New, and more expensive, solutions are raingear made of waterproof "breathable" materials such as



Gore-tex. You can improvise raingear by cutting a head and two armholes into a heavy garbage bag. Two approaches to raingear are a jacket & pants "rain suit" combination and use of a poncho. Regardless of the approach, at the first sign of rain, stop and don your rain gear and cover your pack. Don't assume it will be a short, light rain. Raingear doesn't function well inside your pack or once you are wet.

- **Military-type poncho.** This is one of the most versatile pieces of gear you can pack. Although specialized equipment does each function better, it can serve as raingear, unfold into a ground cloth and be used in lean-to fashion as an effective dining fly when hiking self-contained. Sturdy ones are made of coated nylon and should have side snaps to form raingear when folded and tie down corner grommets for when used as a cover or shelter (cost \$15 – \$30). Vinyl ones just aren't durable enough for repeated use. Some are available with a "hunchback" specifically intended to cover the hiker and pack together. With a little care, this type of poncho can eliminate the pack cover. However, unless weight is a paramount concern, continuing to use a pack cover is a good idea.
- **Ground cloth.** A ground cloth under your tent does two things: (1) it provides a moisture barrier between the cold ground and your warm body and (2) it smoothes out any imperfections in the ground under your tent by "stretching" across the dimples. It also protects your tent floor from jagged rocks and sticks.
- **Sleeping pad.** It acts as a moisture barrier, but also elevates you above any moisture that might seep into your tent. Self-inflatable pads are convenient but relatively heavy, especially full-length ones (2 - 3 lbs.). Closed-cell ones are lightweight (10 - 16 oz.) and cost about 25% of self-inflatables. However, it is bulky. Bulkiness is less of a problem if it is rolled and lashed on the outside. Newer closed-cell designs fold like an accordion.
- **Avoid the low ground.** Consider the terrain around your tent. Be careful not to set up over an indentation because water will accumulate there and standing water is likely to penetrate your tent before water that is running off. Setting up on a slight "knob" results in water running away from your tent, but don't dig a trench around it. Also, be careful not to camp too near streams that could rise in a flash flood -- where the valley is narrow but drains a large area. Although you want to avoid low ground, you may want to avoid the tops of bald hills when there is the possibility of lightning.
- **Full-coverage tent fly.** Water "beads" and runs off a properly coated fly. This process is interrupted when a "wick" is provided to draw the moisture through the minute fabric holes remaining. (The reason for "seam sealer" or "taped seams" is to fill the bigger ones around stitches.) An object against an outside wall provides that "wick" to draw moisture in. Even though a single-walled section of a tent can be made of the same material as the fly, double wall construction puts a space between the wet fly and the sleeping compartment (which is often made of breathable lighter cloth or screen netting). Full-fly construction puts this space between you (your gear) and the wet fly all over the tent. A partial ("umbrella") fly leaves a single wall down where you and your gear are, can touch the single wall, and potentially provide a wick to draw in moisture. The full coverage fly also drops the water off a little away from the tent, which somewhat inhibits it from running or wicking back under the tent. Full-coverage flies come in two general types of construction; one uses a tent pole attached to the fly across the top to create an "awning" over the door and rear window (for ventilation) and the other stakes the fly directly to the ground all around to create a covered vestibule (storage area) in front of the door. Full coverage usually costs a few ounces in weight. If you are using a partial fly tent, use caution not to have anything touching the single wall.
- **Wide-brimmed hat.** You wouldn't think a cloth hat would keep you dry, but it does. Water is wicked to the edge of the rim, where it falls off. Non-felt water-resistant coated ones are also available. The wide rim also provides an effective sunshade and prevents things from "dropping down your neck". Vents are a feature to look for. They allow body moisture to escape during warm weather and when high humidity would otherwise trap it. Rain will run around grommetted vents. Gore-tex lined hats provide moisture protection and some degree of breathability even without vents.



"I told you to keep your rice in a plastic bag."

- **Dining fly.** It is an optional item that comes in handy for the crew to "get under shelter", packs and all, in a hurry to wait out a flash downpour. During a persistent rain, this may be your only escape from your tent to meet with other scouts and to prepare and eat food. **WARNING:** don't even think about using your stove in a tent and, even with a dining fly, the stove should be kept outside the edges. A small polyethylene tarp gives protection at reasonable weight. Nylon coated rainflies/tarps have reduced weight at a price.
- **Gaiters.** One problem with hiking in the rain is that your socks can "wick" the moisture into your shoes even if they are waterproof. Waterproof pants that cover the boots will prevent this. Another solution, especially if you are hiking in shorts, is to use gaiters. These are like pants legs from the knee down and attach at the top with elastic and/or a draw string and often strap under the boot to prevent them from "riding up with wear". They are also good protection in brushy areas -- and some protection from low-lying poisonous plants or animals.
- **Waterproofed boots.** Leather soaks up moisture unless treated. Several preparations, including silicon- and grease-based coatings/penetrators, are available. The other solution is waterproof breathable liners in the boot. Examples are Gore-tex liners sewn into the boot lining or in sock form. Even plastic bread-bag liners work for short periods, but aren't breathable. Rubber/plastic over boots tends to be heavy and or not durable enough for rocky trail work.
- **Polypropylene/synthetic liner socks.** When combined with wool socks, they allow the moisture from your feet to be "wicked away", leaving your feet dryer. They also allow friction to occur between the sock layers rather than against the skin, reducing the chance of blisters. Wool retains some insulating qualities when wet.
- **Polypropylene/lycra or other synthetic under shorts.** Cotton holds sweat/moisture and dries slowly, allowing bacteria to grow and creating an irritating surface for "chaffing". That can be a particularly real problem for people with oversized thighs. Polypropylene or Lycra shorts (short workout tights, form-fitting biking shorts without the pads) are non-absorbent and allow the moisture to escape. Further, because they typically are longer than boxers or briefs and have a "slippery" surface, they eliminate the skin-to-skin rubbing that causes chaffing. They dry incredibly fast. This is the idea behind Lycra lined (double-layer) mountain biking shorts.
- **Synthetic-fill sleeping bag.** This is more in the category of "getting the moisture out" once it is in. Synthetic fill tends to dry quicker, retain insulating properties better when wet, and retain water weight less than down or cotton.
- **Hand warmer.** Consider carrying a "Hot Hands" type disposable warmer (hunting and construction worker item) with the crew first aid kit to put into a sleeping bag for dealing with hypothermia or to help in drying it out. Because they entail combustion, they are not recommended for using them with a person in the bag except for the emergency hypothermia case.





Sleeping Bags



A sleeping bag would probably be the first piece of equipment to buy. It is not real expensive, it is kind of personal and it has alternative uses in the off season or after you lose your lust for backpacking (hope not) -- during sleepovers at friends' and relatives' houses or as a cocoon for watching TV on cold winter nights. Besides, on a typical backpacking trek, you spend about one-third of your time in your sleeping bag.

The basic criteria for choosing a sleeping bag should be:

- **Weight less than 3 ½ pounds for a 6' bag.** Shorter bags should be proportionately lighter and longer bags a little heavier. If it is low in weight, it will likely stuff into a small shape for packing. Sleeping bags are relatively bulky items. Tapered "mummy" bags (see pictures above) hold weight down and the heat in. Stay away from department store rectangular bags; they generally are low priced, less efficient heat preservers and usually weigh a minimum of seven pounds -- way too much for a 100 lb scout who needs to keep total pack weight below 25 lbs (25%).
- **The bag is rated for 20°-30° temperatures.** This is a good balance of weight and function, and the rating of the majority of bags on the market. Such bags span three seasons - Spring, Summer, and Fall. With additional clothing or a liner, they can go lower.
- **The bag uses synthetic fill of Hollofil, Quallofil or Polarguard.** Down is lightweight, stuffs into a small shape, is expensive and has great insulating qualities, but is disastrous when wet. Further, once wet, it is heavy and hard to dry. Leave down to the experienced crowd. Synthetic fill is more forgiving for newbie scouts. Don't worry too much about the outer shell of the bag; most are made of some form of serviceable washable nylon. Most synthetic bags wash and dry easily.
- **It fits your build.** If you are 5'4", why carry the weight for fitting a scout 6 feet tall? If you are 6'4", a standard 6' bag will be cramped. Most people will fit a 30" width bag -- lower weight. Those over 200lbs should stick to 32" widths and those very full bodied (well muscled) should consider "oversized" bags that are 36" wide.

So, what will you pay for such a bag? \$50 – \$150. Campmor (<http://www.campmor.com/> -- 1-800-226-7667) has many selections. You can request a free catalog. If you stick to the specifications above, you should be able to find a serviceable bag at a reasonable price.

Now a few hints on packing. During storage (non-use), sleeping bags should not be stuffed in small sacks because constriction can reduce the "loft", reducing its insulating qualities. When in use, stuff the bag into the smallest stuff sack it will fit. Some compression sacks use webbing to get size even lower. This is particularly important for internal frame packs because they go inside (lower zipper opening) and displace other gear. Size is not as crucial for external frame packs because they get strapped on the outside (bottom or top) of the frame pack. Stuff sacks should be lined with a plastic bag before inserting the sleeping bag. A "gooseneck" closure on the opening will keep the water out. External plastic bags work but tend to get snagged. **Never use your sleeping bag stuff sack as a bear bag.** The food smell gets transferred from the stuff sack to the sleeping bag. Do you want to be a bear lollipop?



IT'S A 'FOUR SEASONS' SLEEPING BAG

How to Care For Your Sleeping Bag

Care

Want to extend the useable life of your sleeping bag? The following are a few tips to help you:

- Don't pack your bag wet. If your bag does get wet hang it out to air dry or fluff dry it in a dryer *without heat*.
- Hang your bag out after each trip and allow it to air out. Washing your bag after each trip is not necessary (unless each trip is one month in the backcountry). When your bag needs a bath follow the directions provided by the manufacturer. Washing your bag in a large laundry mat style machine is better than using your home machine. A machine without an agitator is best (front loading) so drawstrings and straps don't get wrapped around the machine in the washing process or worse, torn off. (See the section below on cleaning.)
- When hiking or going into the backcountry, store your bag in a waterproofed compression sack. Trust us, you will be glad you did. The bag will stay dry, even if you take a dump into a river by accident when traveling the backcountry. Having a dry bag and the ability to make a fire can greatly aid you in the event weather conditions sour. Also, the compression sack will reduce the amount of space your sleeping bag takes up in your pack by as much as fifty percent.
- Remember the best secret weapon when in the outdoors, duct tape. Your six to twelve feet of emergency duct tape can be used to patch a tear or seal up a broken zipper.
- Don't be lazy with your zippers. If your bag has two zippers that meet at a middle point don't use one end to go all the way around the bag. This puts a lot of strain on the zipper and increases the chances of a zipper jumping off of its teeth and jamming. Try to have those zippers meeting at a near halfway point to balance the load and the distance the zipper has to travel.
- Always stuff your sleeping bag, never roll it.
- Be gentle with your sleeping bag when removing it from the stuff sack, never yank it.
- Store your bag uncompressed in a large, breathable storage sack or king-sized pillowcase. Hanging it or storing it flat also works.
- Accumulated body oils, sweat and dirt can rob your sleeping bag of its insulating power. Keep them away from your bag by sleeping in clean, long underwear, socks and a hat. If it's warm out, wear clean cotton clothes to bed. Just don't fall into bed in the same clothes you hiked in. You'll drag dirt into the bag with you, and you're likely to sleep colder because of accumulated perspiration in the clothes (even if they feel dry). And never sleep in the clothes you cooked or ate in. This is extremely important in bear country!
- Never lay your bag directly on the dirt; use a ground cloth.
- Don't store your bag rolled up tightly in a compression sack. Bags stored for a long time that are compressed tightly can lose their loft. Stuffing is actually easier on the fabric and fill. Store your bag rolled up loosely and in a breathable sack made of canvas.
- Air and fluff your bag after each use and never leave it compressed for long periods. Take your bag out every three to six months and fluff it up to help maintain its loft.

Cleaning

Every sleeping bag, down or synthetic, must be cleaned. Accumulated body oils, trail dust and grime all serve to decrease the effectiveness of a bag's insulation, and increase obnoxious odors and fiber-weakening microbes. Note: Dry cleaning is not appropriate for sleeping bags, especially down. Solvents used in dry cleaning can strip the natural oils from down that help it retain loft. Solvents are also very difficult to remove from synthetic insulation. If you decide to wash your bag yourself, use a gentle, non-detergent soap such as Nikwax Down Wash 2.0, which is made for washing down- and synthetic-filled items.

- **Down:** For down bags, hand-washing in a bathtub works best. Fill the tub with warm water and add one of the above-recommended cleaners. Put the bag in and gently work in the soap, then allow it to soak for 15 minutes. Drain the tub and press out any remaining water. In a cold-water rinse, work the soap out gently, let the bag sit for 15 minutes and drain. Press out any remaining water. Repeat the rinse until all the soap is out. It's also possible, (according to some bag manufacturers) to machine wash a down bag, as long as a front-loading washer is used. Never use an agitator-style machine as the motion can damage the stitching and insulation. Make sure to wash on the gentle cycle in cool water with one of the aforementioned down soaps.
- **Synthetics:** Synthetic bags can be washed in the same way. Hand-wash in a bathtub, or use a large, front-loading washer with no agitator. Use cool water and mild soap. Rinse several times to make sure all the soap is removed. An extra spin cycle or an extractor may be used to remove excess water.

Drying

- Air drying is the safest way to dry your bag, but obviously the longest.
- If you tumble dry your bag, use very low heat or a no-heat setting and keep an eye on it. Dryers have varying heat outputs, so you need to check periodically to make sure the shell and insulation aren't overheating, which can actually lead to melting.
- Add a couple of clean tennis balls when the bag is nearly dry. This will help break up any clumps of insulation and help restore the loft.

Restoring DWR

The original DWR (durable water repellent) finish on a sleeping bag's shell eventually wears off. You can restore water repellency and help keep the bag cleaner if you reapply this finish. There are several products available to restore the DWR to your sleeping bag shell fabric.

Leaking Down

Many, but not all, goose-down bags feature "down-proof" liners and shells made of very tightly woven fabric which prevent the down from getting through. If a few feathers escape through the shell or liner of your bag, don't become too concerned. This is normal, especially along the seams. The sharp quills of the feathers may poke through, especially when the bag is new and the down hasn't totally settled. Work the feathers gently back inside, pulling from the opposite side; the holes should be minimal and close back up.

Fabric Tears

For small holes or tears in the sleeping bag shell, a patch of nylon repair tape will do the trick until you get home.

Sleeping Pads

The Secret to a Restful Night on the Trail

Many hikers, especially beginners, overlook the importance of a good backpacking sleeping pad. Even if you have the best sleeping bag in the world, you can still end up spending a miserable night under the stars if you lack a sleeping pad. Every good sleep system includes a sleeping pad. First, it provides another layer of insulation between you and the cold, hard ground. When you sleep on a sleeping bag only, your body weight crushes the insulation in the sleeping bag against the ground, making it much less effective. Also, sleeping pads are important because they provide cushioning. Let's face it - the ground is usually uncomfortable. You can try to cushion yourself with by making a pile of leaves or pine needles, but using a sleeping pad has much less impact on the environment. The more comfortable you are, the better you will sleep-and the happier you'll wake up in the morning!

Now that you know why a sleeping pad is a necessity, you need to know what kinds of pads are available so that you can choose the one that's right for you. There are four types of backpacking sleeping pads on the market today: backpacking air mattresses, open-cell foam pads, closed-cell foam pads, and self-inflating pads. Each type of sleeping pad has its pros and cons.

Backpacking air mattresses are small, thin inflatable mattresses. The idea of sleeping on air after a long day on the trail may sound heavenly, but air mattresses are not always the best choice for backpacking. They are undeniably comfortable, but they have several drawbacks. The first is the possibility of leaks. Backpackers put their gear through a lot of stress, and even a durable air mattress can spring a leak. Leaks are a pain to fix in the field, especially at night, but if you don't fix it, you'll be sleeping on cold, hard ground. Backpacking air mattresses also do a poor job of insulating. The large, open space of air inside the mattress chills to outside air temperature and circulates that air underneath you. Thus, most backpacking air mattresses are only suitable for warm-weather use. Some backpacking air mattresses remedy this problem by adding insulation.

Closed-cell foam pads are the warmest type of backpacking sleeping pad available. They are also the least comfortable in that they pads provide very little in the way of cushioning. Closed-cell foam is a dense, thin foam made up of tiny closed cells that stop air circulation (retaining heat) and block water absorption. Thus closed-cell foam pads are water-repellent, warm, light,

and may last forever. They are also cheap, so if you are on a budget, this is the sleeping pad for you.

Open-cell foam pads have open air cells. Open air cells can squish further so they feel softer and have more "cushion", but as a result have to be either larger or heavier to compensate. Not so good for backpacking. Also, the open air cells absorb both water and allow some air circulation, meaning they are poor insulators in cold weather and worse than useless if the ground gets wet. They are warmer than uninsulated air mattresses, and more comfortable than closed-cell foam. They are also cheap.

Self-inflating pads combine the comfort of open-cell foam pads with the warmth and weather-resistance of closed-cell foam. A self-inflating pad consists of open-cell foam covered in waterproof, airtight material. An air valve lets you inflate the mattress as much as you like—just open the valve and the open-cell foam sucks air in. They tend to be heavier than closed-cell foam and they are more expensive. Nonetheless, these pads are very popular and are probably the best choice for backpacking in terms of comfort and versatility. If you take care of them, they will give you many years of comfort and enjoyment. To help your self-inflating pad last as long as possible, store it flat with the valve open. This allows any moisture inside the foam to dry out and prevents the foam from breaking down. To minimize the amount of moisture that gets inside, allow the pad to self-inflate as much by itself as possible; then blow any additional air into it to get it to the firmness you desire.

Length and shape is another consideration. Some backpacking sleeping pads are only made to fit the upper half of your body. This saves weight, and is great for summer trips. For winter trips, however, you need a full-length pad. Also, make sure that the pad material has some texture to it so that you don't slide off.

Choosing a backpacking sleeping pad is much like choosing any other piece of gear. First, you have to consider the conditions you will be backpacking in, the features that are most important to you, and the price you are willing to pay. Then, you will be able to select the perfect sleeping pad to complete your sleep system. Pleasant dreams!



Tents



Dome



A- Frame



Frog (without rainfly)



Tube/Bivy

What tent should you use? This is a very important decision because the tent is your front line of defense against moisture and, along with your sleeping bag, where you spend about a third of your time. Many troops have tents that scouts can borrow, but eventually you may want your own or parents may need to invest in one in order to share the camping experience. As with other equipment, the mistake that is often made is buying the \$50 special at the local department store. These tents are generally too heavy and unreliable for backpacking and tend to be difficult to set up.

Tents generally are some variation of one of the four basic designs shown at the top of this page. As with other equipment, a wide range of tents are serviceable as long as they meet some basic criteria and the limitations of some designs are considered. For example, although tube/bivy tents are a favorite of light through-packers for summer because they tend to be light and easy to set up, they are not such a good choice for winter camping because the absence of a free-standing frame allows them to sag under snow weight. Geodesic dome expedition tents are great in winter, but hardly the choice for summer backpacking because their extra frame structure and heavier cloth cause them to weigh twice the desirable backpacking weight and often have marginal circulation.

Basic criteria for choosing a tent are:

- **Total pack weight less than 6 pounds for a two-person tent.** You should be able to find a comparable single-person tent that is less than 4 lbs. Be cautious to look at the "packing weight" because it is likely 1/2 to 1 pound more than the "tent weight" because tent weight only includes the tent body, fly and poles while packing weight also includes the rope/cords, stakes, stake bag, pole bag and tent bag.
- **Double-wall construction and a full coverage water repellent (coated) fly with taped or sealed seams.** Other designs risk wicking water when items lean against the side.
- **Nylon (not polypropylene) floor with taped or sealed seams.** There is a reason that cheap tents use poly flooring but more expensive ones don't -- they use coated nylon. Poly is inexpensive but tends to leak around the stitching, is non-forgiving if even slight separation of the "strands" occurs and small holes tend to expand into large ones. The solution for poly floor problems is duct tape -- sewing just creates more holes. For nylon floors use adhesive nylon patches (available at most outdoor stores), which can also be sewn and seam sealed. For larger holes, like a 1" burn hole in a troop tent floor, use a patch on each side -- they seal to each other in the whole area.
- **Two (cross) ventilation ports.** Often this is screening in the door and a rear window. Many tents have small vents in the top to let vapor escape and have "breathable fabric for walls above the rainfly area. Ventilation can be a problem during summer for full-coverage tents with vestibules unless the vestibule flap is open and fastened back. Also make sure that the sleeping compartment (body) is fully enclosed from insects, reptiles and rodents.
- **Heat-treated aluminum poles/hoops a plus.** Fiberglass poles work OK but tend to split after repeated use and are somewhat heavier. Setup may also be a little more difficult with fiberglass poles because of the external joining collars may hang up on long fabric tent body sleeves or catch attachment clips. Because aluminum poles usually have internal connecting collars, they slid easier through fabric and don't have raised portions to catch the clips when stretching out the fabric. Very few tents under \$100 use aluminum because of the cost. Replacement fiberglass poles can be cut from generic repair parts available at most department stores that carry tents. Although, they are durable,

aluminum replacements often require a visit to specialty (outfitter) shops or catalogs (like REI). As long as weight is acceptable, don't fret about an otherwise serviceable tent having fiberglass poles.

- **Freestanding a plus.** Some A-frame and almost all tube/bivy style tents are not freestanding. That means the tent will not hold up under its own weight without stakes driven into the ground to "stretch" it out. Even freestanding tents require staking in wind and to "stretch" out the tent (rain) fly. A non-stretched fly often leaks because moisture doesn't bead off or runs against the tent body fabric (which may not be waterproof or may allow "wicking"). As mentioned earlier, absence of a full frame structure may also allow sagging during heavy rain or snow. Free standing tents are a plus if you also use your tent in congested campgrounds because their stakes tend to be placed very near the main tent and, therefore, are less susceptible to "tripping" passersby. Because framing weighs, non-free standing tents often weigh less and are good choices when conditions aren't extreme.
- **Adequate headroom.** To sit up in a tent you need at least 36 inches of height. Most tents have 42 inches. Many tube and bivy tents don't have this. Part of the rationale for the "frog" tent was to add a freestanding frame and headroom to the bivy design -- which often has 24 or less inches of headroom. This is important if you want to do something in your tent, other than sleep, during inclement weather. Some people refer to bivies as "coffins".
- **Short pole sleeves and clip fastening of fabric to frame.** Until recently, fabric sleeves that hold the poles or hoops to the tent body tended to run from the bottom of one side, over the top and down the other side with only a short intermission at the top. This required that poles be "feed" through the sleeves, made them hard to setup, and sometimes resulted in broken poles. Raised collars joining fiberglass poles compounded the problem. Now, some tents use only clips. The trend seems to be to have short sleeves (for support) at the top combined with clips down the sides. Besides ease of setup, non-full sleeves allow for better air circulation. Full-sleeve tents were quite stable in wind because of the structural support offered by the full sleeves and the fly was fastened just at the bottom. Part sleeve and clip-only tents are not so stable and their frame poles tend to "move around" in wind (leading to collapse and breakage) unless they are fastened to the fly. Most of these flies have Velcro fasteners about half way up the wall to wrap around the tent poles to make the frame more rigid. Short sleeves and clips are an important feature for ease of setup, but make sure that the tent has these mechanisms for fastening the fly to the poles for rigidity. If it doesn't, reject it. Further, if you aren't going to religiously fasten these stabilizers, stay away from this style of tent.
- **Consider investing in a ground cloth.** It both provides a moisture barrier and protects the floor from sharp rocks and sticks. Both nylon and polypropylene ones are available. A poly tarp provides protection and comfort in smoothening out the sleeping place. Ground clothes can also be cut from construction plastic.

Tent Care and Cleaning

Your tent is your shelter in bad weather and your protection from the elements in the great outdoors. With proper care, a quality tent can last many years and provide you with many days and nights of clean, warm, comfortable shelter.

Always practice preventive care.

Remember what your grandmother told you, "An ounce of prevention is worth a pound of cure". Investing in some preventive care will mean a long life for your tent. Before you take your tent camping, set it up somewhere out of direct sunlight. Check the tent and make sure nothing is missing. Put on the fly and make sure to anchor it down and draw it tight. A tent that is properly cared for can offer years of service. Proper care of a tent is simple.

Buy some seam sealer recommended by the manufacturer and painstakingly seal all the outside seams of your fly and the floor of your tent.

I know, the tent instructions say it is waterproof and that all the seals have been treated and sealed. Trust us; seal them, if you don't even a \$1,000 four season tent can leak when it rains. This job isn't much fun, but will give you a completely watertight fly and floor. If you are feeling extremely eager, you can even seal the inside seams as well, but this is usually unnecessary. You will appreciate your efforts when the first downpour comes.

Seam sealing is mandatory on single wall tents. Although seam taped from the inside, single walls have exposed seams on the outside which need to be sealed. Especially because they do cost so much and you cannot replace a fly, you need to seal your single wall to keep it water tight longer.

Practice setting up your tent.

Learning to setup your tent should not be done at the campsite with the sun going down. Improper setup can cause tents to sag, broken poles, cut guy lines and ripped tents. Know how to set it up and pack it. A common mistake when packing your tent is folding it into a neat little package. Your tent stuff sack is called a stuff sack for a reason. Take the sack, put in the poles, then the fly and then the tent body. This makes sense; consider this if you are setting up your tent in a windstorm. Are you really going to take the time to fold you tent nicely? No, you shouldn't be either. Also, consider this, same windstorm, you pull out your fly first, since this is the last piece to go on, it will just get in the way and get blown away while you are setting up the tent body. Put in the tent body last and it will be the first thing you grab when you set up your tent, as it should be. The other and more important reason for not folding the tent is the fly can form creases and cracks after being repeatedly being folded in the same way. While your tent may look nice and pressed, you will feel rather silly when water is seeping through the creases.

Check your campsite before pitching your tent.

You're looking for two things; to make sure you're not placing your tent on top of rocks, roots or uneven ground that can cause damage to your tent and an uncomfortable night for you, and that the nice, flat, smooth area you find is not the lowest point on the campsite. Otherwise you could be flooded out in a storm when all the water runs downhill into your tent.

Use a groundcloth.

This helps protect the exterior floor of the tent as well helping to prevent water from gathering under the floor. The best way to do that is to take a tarp or piece of 3 mil plastic sheeting and cut it just a little smaller than your tent's "footprint" so that the edges of the tent floor extend out slightly beyond the groundcloth's edges. If you don't make the groundcloth smaller, then water will gather on top of the groundcloth and then run in between the groundcloth and the exterior floor of the tent. Not a comfortable feeling in the middle of the night.

Keep it clean - Inside.

Remove your footwear at the door to avoid tracking dirt and water inside the tent. If you can't or don't want to leave your shoes or boots outside the tent, use a plastic bag or the built-in pockets on most later model tents to store them inside. If you do get dirt or a stain inside, clean it up immediately to reduce the chance of further damage.

Keep it clean - Outside.

There is almost no way to avoid getting dirt, stains, bird droppings, tree sap droppings and lots of other various things on the exterior of your tent. Always use clean water and a rag or sponge to clean up those stains or dirt as soon as possible.

Don't pack your tent wet.

If your tent does get wet and you have to break camp, set it up as soon as you can and let it dry out. Just like a sleeping bag, let your tent hang out after each trip. If your tent does mildew, wash it gently with warm water. For serious cases we recommend contacting the manufacturer. Don't use detergent or chemicals as this can ruin the tent or neutralize its waterproofing. If after you have cleaned your tent you still have a mildew smell, contact the manufacturer. Once the mildew has gotten into the material, it is very difficult to get rid of it.

Mildew cleaning tips.

A musty odor, and/or small cross-shaped spots on the tent fabric indicate mildew formation. Mildew, a fungus spore, requires a dark, warm, moist environment to grow. Mildew uses the dirt and soil found on many tents as nutrients to grow and reproduce. This fungus actually penetrates the urethane coating of the tent fabric and grows between the tent fabric and coating, eventually lifting the coating from the fabric. Waterproofness is thus lost and the fabric is eventually destroyed.

Should mildew begin to form, immediate action can be taken to retard further growth. Wash the tent as instructed above. Next, sponge-wipe the tent with a dilute solution of McNett MiraZyme. Sponge over the affected areas and allow to air dry, out of direct sunlight, without rinsing. This will kill the mildew on the tent, and prevent it from getting worse, but it will not remove the mildew marks.

Pole care.

DO NOT allow the shockcord to snap the pole sections together, this can damage the poles. Wipe poles with damp cloth to remove any saltwater, as saltwater can cause corrosion on the poles. Store your poles only after they are completely dry.

Zipper care.

Keep loose threads trimmed. Keep free from dirt. Spray periodically with a non-greasy, non-staining silicone spray designed for fabrics. To prevent salt water corrosion on zipper pulls, make sure you rinse with clear water after exposure.

Repair.

Science fiction author Carl Zwanzig wrote, "Duct tape is like the Force. It has a light side, a dark side, and it holds the universe together." That may be a slight exaggeration, but duct tape is a tent's friend. You can use it to quickly patch a rip or tear and prevent it from getting worse, seal up split seams, fix broken support poles and many other repairs. The key is to make those repairs immediately, before they become unmanageable. Hopefully you will not need to repair your tent in the field, but there may come a time when you need to be prepared. Rips and tears can be temporarily alleviated by heated duct tape, which you should have in abundance.

Usually the poles are first items to break, since they receive the most stress. Think about the torturous bend they have to go through in order support your tent and the amount of stress this puts on the metal. The accessory kit that comes with your tent should have a repair sleeve. A little aluminum tube, the sleeve fits over the break, use liberal amounts of duct tape to keep it in place.

Another common problem is a ripped pole sleeve, again duct tape should be able to repair the tear. Just remember that duct tape does not stick to moist areas and useless when cold. Use a lighter to warm up the tape and apply it to the rip. Continue to use the lighter on the tape so it can meld to the tent fabric better.

Perhaps the most annoying repair is a broken zipper. Tent zippers have the unenviable job of have to zip in circles or arch under incredible stress from the tent. When a zipper blows, it is hard to repair. Most tents have a mesh door, you can often "sew" the broken door to the mesh door as a temporary fix. Manufacturers offer zipper repair kits that can rejoin the broken zipper, but there is nothing for zipper with broken teeth. If the zipper separates and it is small, release tension on the tent by taking releasing the poles. The slack may be enough to run the zipper through and rejoin the teeth. As they say, an ounce of prevention can save you time and despair, so make sure your tent zippers are working well before you head out on your expedition.

Make sure your tent is ventilated.

On a cold night it is tempting to close up all of the windows and flaps of a tent tight but this can cause another problem. As you sleep you sweat and breathe out about a cup of fluid. Four people in a tent can release almost a quart of fluid. When the inside of the tent becomes warmer than the outside air, this moisture can start to condensate on the inside of your tent and make things pretty wet inside by morning. Make sure you have some ventilation point(s) open in your tent to help reduce condensation.

Stake down your tent.

Although freestanding tents don't require you to stake them down, the weather can. A strong enough wind can move a tent, even with occupants in it! If you are setting up your tent on a windy day, put your pack and gear in the tent to help hold it down. Make sure that the proper amount of tension is set as you stake down the tent, enough that it can flex in the wind, but not so much that the material will flap and beat itself.

Never, ever, ever keep food inside the tent.

Hungry critters will chew through the tent fabric in search of a snack. In bear country, it's an invitation for you to become a bear snack. If you are packing your tent in an interior pack compartment, keep it in a separate bag to avoid contamination from food or other smellables and **never** use your tent bag as a bear bag. The food smell gets transferred from the stuff sack to the tent -- your sleeping compartment. Do you want to be a bear lollipop?





Stoves and Cookware



Stoves

Not everyone has to own and pack a stove. A rule of thumb that works well and is the one used at Philmont is that a crew needs at least two stoves and beyond that up to four people can share a stove. Just make sure that sufficient fuel is taken. Further, often water can be boiled for more than one person's cooking, cleaning and sterilization requirements at once, cutting down on time and fuel consumption. If two leaders carry their stoves, only one or two more is sufficient for an appropriately sized crew. On troop hikes, three per stove is adequate. So, it may be possible to defer your stove purchase until you get serious about backpacking and have experienced several types and know for yourself what you need. Sharing stoves also allows distribution of weight away from less able backpackers.

Two popular "component" stoves are the MSR Whisperlite Shaker Stove -- upper left illustration -- (14 oz. + 4.3 oz. for 22 fl. oz. bottle = 18.3 oz.) and the Peak 1 Apex II Stove (Coleman) -- lower left illustration -- (19 oz. including 22 fl. oz. bottle). The Shaker is very popular, with its rotating legs, for packing into a small profile. The Apex's advantages are that its second regulator valve is easier for newbies to adjust in simmer mode and has a built-in windscreen. The shaker uses white gas, while the Apex II uses white or unleaded gas. Both have variations on their basic design. Peak (Coleman) has varieties that have the gas tank integrated into the base. In general, the Peak's are bulkier. Peak also makes several butane/propane cartridge stoves. Butane and propane stoves light easily and are dependable, but require packing a second cartridge if the trip is long or the first cartridge is already partially used. Liquid fuel bottles can just be "topped off". Several people have indicated that butane stoves lose some of their ease and effectiveness in cooler higher-altitude settings. Don't forget the waterproofed matches or lighter!

Cookware

Unless you go to something like titanium (spelled with a "\$"), your basic choices are aluminum or stainless steel. Aluminum is much lighter but doesn't conduct heat as well, or clean up as easily, as stainless steel. Because food tends to stick to aluminum, stick resistant-coated wares are available. One important feature of cookware is that it stacks within itself, because it is bulky. Besides stacking, sometimes the stove can be packed inside the cookware. For one person, a 3/4 quart pan & lid for boiling water, a bowl, and a small plastic or aluminum-measuring cup are sufficient. A small fry pan could be substituted for the bowl. Quite often, these sets have both a bowl and fry pan. Such combination -- upper right illustration -- can easily be found in either aluminum (with anti-stick fry pan) or stainless steel. The non-coated aluminum versions are the cheapest. There are also some real nice two-person sets that, while heavier and costlier than a one-person set, are much lighter and cheaper than two individual sets. MSR makes a really nice stackable anti-stick aluminum set that would work for 3-4 people.

One set not recommend is the steel Army issue mess kit that includes a two-compartment plate and fold-over-handle skillet. These are re-e-e-eal heavy. Aluminum versions may be OK, but a better choice is the traditional Boy Scouts style cook set -- stackable bowl, fry pan (with swing-around handle), small pot and lid -- similar to that in the upper right illustration. Generic aluminum versions can often be found in department stores and work just fine.

"One-pot" cooking can be an interesting alternative and economical if the crew or troop already owns a multi-person camp-set. Eight to twelve people can easily split up a set containing an 8 qt. kettle & lid, 4 qt. kettle & lid, and a 10 inch fry pan, with each scout carrying their own bowl, cup and utensils. Texsport offer a copper bottomed stainless steel set.

Some people carry a 16 oz. (1/2 quart) stainless steel mountain or sierra cup to do double duty as a cup and small pot. Utensils should fit inside the cookware along with the stove. Lexan sets are lighter. Cut-down Rubbermaid or Lexan mini-spatulas work well. Use a tablespoon (rather than a teaspoon) so that it can triple as a stirrer, a ladle and an efficient food shovel after a long hungry day on the trail.

The examples from above can be found in most popular outdoor catalogs or websites. Department stores, such as Wal-Mart, are also potential sources. You should be able to find serviceable stoves and cookware at reasonable prices.

Clothing for the Backcountry

What clothing you choose is important. The clothes you bring with you on a backcountry trip must perform two important jobs. First, they must protect you from the elements (sun, rain, snow, wind, and insects). Second, they must keep you comfortable during a variety of activities and weather conditions. The best way to choose backcountry clothing is to build a "system" of clothing layers that can be mixed and matched to handle different trips and different conditions. Wear clothes appropriate for the terrain and weather conditions you expect to encounter. Since, weather is unpredictable, it's imperative that you prepare for the unpredictable. If you follow the layering principle, you should be able to equip yourself with the appropriate clothing for any type of weather.

How to Get the Outdoor Clothing Formula Right

You should expect your outdoor clothing to provide you with functions of breathability, wicking, rapid drying, insulation, durability, windproofing and waterproofing. Comfort depends upon the appropriate balance between these functions. In addition, you also want your clothing to be lightweight and allow good freedom of movement. With four uniquely functioning layers, you can create a "personal climate" that keeps you comfortable and protected from the different weather conditions. Most items can be used as a different layer in different situations.

Some Basic Definitions

Layering

Layering is the practice of dressing in a number of lightweight clothing layers instead of one or two heavier layers. Layered clothing systems are versatile (you can add or remove layers in response to changing conditions) and efficient (a number of thin layers will be warmer than one or two thick layers, and they'll take up less room in your pack). It takes some practice to get your clothing formula just right, since every person has different insulation requirements, depending on body size, body temperature and fitness level. Your clothing must keep you warm and dry, but also provide ways to keep the body ventilated. The more options you have available, the more fine-tuning you can do and the more comfortable you will be. A general rule when choosing your clothing is to wear loose clothes in layers. Start with a base layer to manage moisture, and then add mid and insulation layers, as needed. In a temperate climate, top it all off with a weatherproof outer layer.

Wicking

Certain clothing layers enhance comfort by pulling sweat from the surface of your skin and transferring it into other clothing layers. This process, called wicking, keeps you dry and comfortable in warm conditions. It also keeps you warmer in cold conditions by reducing evaporative and conductive heat loss.

Breathability

You need clothing layers that let your sweat and body heat escape to stay comfortable when temperatures rise or your activity-level increases. A garment's ability to do this is referred to as its breathability. Breathability is affected by the materials that a clothing layer is made out of and the design of the layer itself.

Consider the Layers You'll Need

Backpacking clothing can be grouped into 4 basic categories: inner layer, mid layer, insulation layer and outer layer. Each type performs a specific task within a clothing system. Whether or not you need them depends on your backpacking plans.

Inner layers

Inner layer clothing is worn right next to your skin. Its job is to keep you comfortable by wicking the sweat from your skin and providing an extra layer of insulation. Inner layer clothing is usually worn in moderate to cold conditions when a little extra insulation is needed and the chance of aerobic activity is high. It's available in a variety of thicknesses for different activities and weather conditions.

Mid layers

Mid layer clothing consists of the items you use every day: shorts, T-shirts, lightweight pants and long-sleeve shirts. The primary function of mid-layer clothing is to provide basic insulation and protection in warm conditions. Mid layer items are often worn alone on short trips in good weather conditions. The pieces you choose should be comfortable, lightweight and built to last. Include a synthetic long-sleeve shirt in your pack. Besides keeping you warm when it's chilly, a long-sleeve shirt will protect you from sun and insects.

Insulation layers

Insulation layer clothing is designed specifically to provide additional warmth. It's typically worn whenever mid layer and/or inner layer pieces are not warm enough for the current conditions. The insulation layers you use should be warm, lightweight and as non-bulky as possible. They should also breathe well to let sweat and body heat escape.

Outer layers

The primary job of outer layer clothing (both tops and bottoms) is to protect you from the wind, rain and snow. But it needs to be somewhat breathable as well, to let sweat and body heat escape. Backpackers should always carry protective outer layers. Headgear is an important outer layer that can provide sun protection and warmth, but the type of headgear you will choose will depend on the weather. If it's sunny, a good alternative is a wide-brimmed hat, to protect both your face and neck from the sun. A baseball cap is great when carrying a backpack. If the weather is cold or windy, a warm hat will be good.

Consider Your Fabric Options

Inner Layers

Cotton - Cotton is comfortable when it's dry, but it absorbs sweat and holds it right next to your skin (which can lead to significant heat loss). Cotton also takes a long time to dry, which can cause discomfort. For these reasons, cotton is not recommended for inner layers used in cold conditions.

Silk - Silk is an effective wicking and insulating material. It's extremely comfortable and lightweight, but not as durable as the options below. Some silk layers require special care when washing and drying.

Polypropylene - One of the very first man-made wicking materials that wicks sweat away from the skin effectively. Early versions tended to retain odors and pilled after repeated washings. Newer Polypro fabrics have overcome these difficulties.

MTS 2® (Moisture Transport System) - MTS 2 is a durable, reliable polyester-based fabric that wicks sweat like polypropylene--without its drawbacks. It's comfortable like cotton, and it's available in a variety of "weights" for different conditions.

Capilene® - Capilene is another comfortable, reliable polyester-based wicking fabric. It performs like MTS 2®, with a special chemical treatment to help spread sweat throughout the fabric so that it evaporates quickly.

Mid Layers

Cotton - Cotton is a common choice for warm-weather backpacking clothing. It's comfortable, lightweight and it keeps you cool. Cotton is best for warm weather uses because it takes a long time to dry and is an ineffective insulator.

Nylon - Lightweight, durable and (generally) non-absorbent, nylon is great for backpacking shorts, pants and shirts. It is available in a variety of styles, for both warm and cold weather uses. Most modern nylons are soft and comfortable against your skin.

Wicking materials - Some backpackers wear wicking inner layers like MTS 2® and Capilene® as mid layers. Why not? These layers help you keep dry and comfortable and they provide good insulation.

Wool - A great natural insulator, wool is perfect for moderate to cold weather backpacking clothes. It's available in shirts, pants, over-shirts, sweaters, jackets and more. Wool insulates well when wet but it can be somewhat scratchy and/or bulky.

Insulation Layers

Wool - Wool is a great natural insulator. It's available in knickers, pants, long-sleeve shirts, pullovers, sweaters and jackets. It insulates when wet but can take a long time to dry. Wool also can be heavy and bulky.

Pile/Fleece - These popular man-made insulation materials are available in a wide variety of styles and thicknesses. They are comfortable, warm (even when wet), fast drying and lightweight (half as heavy as wool). Pile/fleece products are available in shirts, pants, vests, jackets, pullovers and sweaters. Traditionally, pile/fleece layers have provided only minimal protection from the wind. But new pile/fleece garments are available today with wind- and weather-stopping liners built right in.

Outer Layers

Weatherproof outerwear is essential if you are heading for an extended backpacking trip. The outer layer of your outdoor clothing seals out weather and protects you from wet, windy, and extreme elements. Your outer layer will depend on where you are and what you are doing. Unfortunately, there is an inverse relationship between breathability and waterproofness. The more breathable it is, the less waterproof it will be. The same goes for the reverse. Weatherproof outerwear that covers the body from head to foot is recommended for any wilderness backpacker or hiker. A waterproof jacket with a hood and a pair of waterproof pants is a good choice. A good complement is a rain poncho; this is also lighter and packs smaller. Make sure the outerwear is roomy enough to fit easily over other layers and not restrict your movement.

Outer layer clothing can be divided into 3 basic categories (see below). Each has its own set of characteristics, and each protects backpackers from precipitation, wind and sweat build-up to different degrees. To choose the right outer layer clothing, focus on the general category that sounds best for your needs. Then consider the design features listed at the end of this section to choose a specific model.

Water-resistant/breathable fabrics

- Positives: These repel wind and light precipitation while providing excellent breathability. They tend to be less expensive than other options.
- Negatives: They are not waterproof enough to protect you in harsh weather conditions or extended periods of rain.
- Typical Uses - Water-resistant/breathable fabrics are perfect for backpackers who travel in arid and/or warm conditions where good breathability is important and the chance of heavy precipitation is low. They are popular among backpackers who plan short trips in good weather and those who enjoy strenuous activities like trail running.

Waterproof/Non-Breathable Fabrics

- Positives: These are completely waterproof, and they're less expensive than waterproof/breathable fabrics.
- Negatives: They provide very little breathability, which can be extremely uncomfortable if it's hot or if you're working hard on the trail. To let moisture out, layers using waterproof/non-breathable fabrics have to be cut extremely loose (like ponchos) or they must have special vents or openings built in to let the heat and sweat out.
- Typical Uses - Because of the lack of breathability, most backpackers stay away from waterproof/non-breathable outer layers (unless temperatures are very low or the chances of heavy precipitation are very high). They are used occasionally in moderate conditions in inexpensive rain pants and emergency ponchos.

Waterproof/Breathable Fabrics

- Positives: These fabrics are both waterproof and breathable (to a degree). They are good performers in a wide range of weather conditions.
- Negatives: Even waterproof/breathable fabrics heat up and trap sweat during strenuous backpacking. Exact performance depends on the specific type of fabric used, the outside temperature, the amount of activity and other factors. Waterproof/breathable fabrics are more expensive than other types of outerwear.
- Typical Uses - More and more wilderness enthusiasts are choosing waterproof/breathable fabrics for their outer layers. These fabrics are comfortable in a wide variety of situations and conditions. And performance levels keep improving all the time.

A Note on Outer Layer Design

There is more to choosing the right outer layers than just deciding on a type of fabric to use. You must also consider the design features included in different jacket and pant models. When you start comparing different styles head-to-head, consider the following:

Fit - Outer layers should be roomy enough to fit over your clothing layers but snug enough to cinch down tight in nasty conditions. They should also allow for a full range of motion.

Access - Full-zip jackets and full-zip pants are easier to get in and out of than pullover tops or pull-on pants. However, more zippers mean a higher chance of leaks.

Specific Features - Specific features can have a significant effect on an outer layer's performance and comfort:

Adjustable Openings - The waist, cuffs and neck should seal tight for bad weather but open easily for extra ventilation.

Vents - Vents enhance breathability no matter what type of fabric an outer layer is made of. Larger vents are typically more effective than small ones, but they may leak more. Typical vents include under-arm zips, side zips, mesh-lined pockets and draft flaps.

Pockets - The more pockets an outer layer has, the easier it will be for you to store essential gear items. But keep in mind that pockets increase the weight of the layer. Pockets should be easy to reach, easy to open and close, and well-protected against leaks.

Hoods - Any outer layer top you use for backpacking should have a hood to keep your head dry. Integral (permanently attached) hoods offer the best resistance against leaks. Hoods that can be rolled up and/or folded away when not in use are easier to deal with in changing conditions.

Storm Flaps - Storm flaps cover zippers, pockets and other openings to protect against leaks. They are commonly found on front zippers, under-arm zips and external pockets.

Sealed Seams - Sealed seams are a must for any waterproof outer layer. They're not necessary for water-resistant ones.



Get in Shape Stay in Shape



The sport of canoeing is an excellent form of exercise. The disciplines it develops are strength, endurance, flexibility and balance. A great cardiovascular workout, which can aid in strengthening the heart and increasing blood flow, it also can help keep the body tone and fit while enjoying nature and the great outdoors.

But, like any other sport, there are precautions. Rotator cuff damage, tendonitis and carpal tunnel syndrome are several injuries that, if not treated and re-habilitation done, can become much worse when undertaking a sport that will require repeated motion over an extended period of time.

It is a smart idea to begin some form of strength training as a supplement to your canoeing. This will aid in several ways:

- Strength training helps to build the muscle tissues needed to give you more power in your strokes.
- It helps to build endurance for those long trips.
- Strength training also aids in developing muscle coordination, balance and "body awareness".

All of these points are needed to stay in control of your kayak or canoe while paddling in any conditions but it's the "body awareness" which is the most important.

"Body awareness" just means that you know what your body is doing at all times. Once you can "feel" which muscle groups are being used for a specific stroke, you can call those muscles into action for better coordination throughout the maneuver. Below are some suggestions for getting in shape, staying in shape, and staying healthy:

The bottom line is to get your body prepared for the rigors of backcountry travel. While muscular strength is important, muscular endurance should be the focus of your training. Canoe tripping isn't a sprint....it's a marathon.

Spend some time in the gym working on low weight / high rep exercises to build muscular endurance. To build your cardiovascular fitness, circuit train, spending little to no time resting between sets. Time on the treadmill and stationary bike should also be part of your routine.

As your trip date nears, it's a good idea to get out of the gym, and replicate a "real life" experience. If possible, get out on the water with a loaded canoe. A couple hours of paddling a few times a week will help build up endurance and muscle memory. To replicate portaging, load your pack with the gear you'll be using and walk around your neighborhood. Tackle hills and stairs...anything that's a challenge. Don't forget to portage your canoe too! Many experienced paddlers head to nearby parks and walk a few km's under their canoe. This helps to build up the small muscles used during a trip...and one's impossible to work in the gym.

Taking the time to prepare your body for the upcoming trip will pay off in spades when you finally set off. Remember to consult a physician before starting any training program

- **Know your physical condition.** Know as much as possible about your current condition before you even start an exercise program (if you are not already one). That knowledge will also minimize potential problems in the backcountry. If you have a health condition, of any consequence, understand the implications and consequences of strenuous exercise and venturing into the backcountry, beforehand. Scouts and the adult leaders will need a physical to participate on a high adventure trip. A medical check-up is a good way to find out if you have anything to be concerned about. The backcountry is not the place for medical emergencies. There is no 911 out there!
- **Not in Shape?** If you're not in good physical condition, you should take the time to set up a regular exercise program. It must be consistent and it must be a priority (or, guaranteed, you will not be consistent and you'll always be on the brink of getting in shape -- but not quite). Just start somewhere. Swimming, biking (human powered), weight lifting, walking, or jogging. It's good to have a variety of activities that exercise a variety of muscles. Start a program you're comfortable with and stick to it on a consistent basis.

- **Anticipate level of difficulty, and train accordingly.** You will put yourself and your fellow canoers at risk, if you think you can wait until the trip and then get in shape on the water. Get in shape to before a trip. In addition, continue with your normal exercising routine. Doing this should allow you the confidence that you will be successful on the water and that your fellow canoers can count on you to be strong and healthy.
- **Stretching is important.** Stretching muscles reduces muscle tension and allows better, more flexible movement. Prior to your daily workout, whether in the backcountry, or at home, take some time to stretch your lower back, legs, torso, neck, etc. Stretching is necessary and will help prevent soreness and injury, both on and off the water.



The Backcountry First-Aid Manual

Treating injuries miles from the ER is an essential skill, but don't pack a medical text. Instead, learn what really matters. The Wilderness Medicine Institute has identified essential tips every hiker should know. Read it, learn it, and go forth to save lives.

Minor Wounds

No wound, no matter how minor, should go ignored in the backcountry. Check out these quick tips to clean it up and keep trekking.

Blisters

Clean well with an antiseptic wipe. Sterilize the point of a pin or knife with flame or an alcohol swab and gently pierce the blister. Massage the fluid out, leaving the roof of the blister intact. Cover with a friction-reducing dressing by cutting a donut-shaped piece of moleskin and place it over the blister. Fill the hole with antibiotic ointment and cover the moleskin with athletic or duct tape.



Abrasions

Scrub the wound with soap and a gauze pad or bandanna, making sure to remove all debris (warning: It'll hurt). Rinse off all of the soap, then apply a layer of antibiotic ointment to a gauze pad and tape it in place. (You can also use a commercial pad with adhesive edges.) The pad should completely cover the wound.

Burns

Immediately plunge the burn site into cold water. Second best: Apply a water-soaked bandanna, a burn gel, or aloe vera. Continue cooling until pain has substantially subsided, then cover the burn with ointment and a gauze pad. If blisters form, prevent the blisters from popping as long as possible.

Heavy Bleeding

Check out what to do when it's much more than a simple scrape or puncture wound.

Apply direct pressure until bleeding stops. Pack the wound with absorbent gauze, apply direct pressure on top, and elevate it above the heart. If it soaks through, add more gauze on top and keep applying pressure. When bleeding stops, clean the wound thoroughly with a high-pressure stream of water. Apply antibiotic ointment to a sterile dressing and completely cover the wound, securing it with tape or roll gauze. Gaping wound? Press the edges together gently and hold them there with wound closure strips. Then apply the ointment and sterile dressing.

Check all wounds (including burns and abrasions) regularly for signs of infection:

- 1) Increasing pain, heat, redness, and swelling;
- 2) More than a little white pus;
- 3) Appearance of red streaks just under the skin near the wound; and
- 4) Fever. If these signs appear and grow steadily worse, find a doctor.

NOTE: Do not close wounds caused by animal bites or crushing injuries; anything involving damaged tendons, ligaments, or bones; or those too heavily contaminated to clean thoroughly. All have a high risk of infection. Instead, pack the wound with moist gauze, cover with dry gauze, and evacuate the patient.

Sprains and strains Here's what to do in the case of a distressed limb. Remember **RICE**: This stands for **R**est, **I**ce, **C**ompression and **E**levation. The ankle should be quickly rested and iced if possible or soaked in cold water from a stream. Even snow can be used as a substitute for ice. Ice the ankle for 20 minutes to half an hour and then remove the cold and let the injured area warm naturally for 10 to 15 minutes before use. Compress the injury with elastic wrap or athletic tape (the basket-weave pattern, right, works well for ankle sprains). Apply it snugly, but not tight enough to cut off circulation, and wrap it toward the heart (for example, up the leg, not down). Elevate the injury by keeping it higher than the heart. Repeat three to four times a day until pain and swelling subside.



Animal and Insect Bites

Though we love backcountry wildlife (well, mostly), sometimes we get no love back. Read up on what to do when Mother Nature bites.

Bees and Wasps

If the stinger remains in the skin, remove it immediately. Apply a cold pack for pain and swelling, and give an oral antihistamine. If the patient has an allergic reaction—difficulty breathing, tightness of the chest, swelling of the throat, dizziness—give a dose of injectable epinephrine (prescription required) and the antihistamine. Evacuate to medical attention ASAP, keeping a second dose of epi on hand and giving more antihistamine every four to six hours.

Ticks

These bloodsuckers can transmit disease if allowed to embed in the skin (sometimes a few hours is all it takes), so check yourself twice a day. Found one? Remove it immediately with tweezers. Grasp the tick at skin level, perpendicular to the long axis of the tick, and pull it gently straight out. Wash the site. If illness and/or an unusual rash develop, consult a doctor.

Venomous Spiders

Black widow bites can be tough to diagnose (many victims don't feel the bite when it occurs). Look for vomiting, weakness, headache, fever, and intense abdominal and/or back pain. Brown recluse bites might sting or itch. For both, clean the wound, apply cold to the site, and give the patient an antihistamine (for itching) and ibuprofen for pain. Hike out to a doctor (don't worry: death is rare).

Venomous Snakes

First, keep the victim calm (a low heart rate minimizes venom circulation, and death from snakebite is unlikely). Remove jewelry, watches, and any snug clothing that could cut off circulation when the bite site swells. Splint the bitten arm or leg, but do not elevate it. Carry the victim out if you can; otherwise, have him slowly walk out for a dose of antivenin.

Mammals

Stop the bleeding. Immediately wash the wound thoroughly with soap and water. Rinse clean, cover with a sterile dressing smeared with antibacterial ointment, and find a doctor ASAP. These bites have a high risk of infection, including rabies—and in that case, the victim needs a vaccination within 72 hours for the best chance of survival.

Gastrointestinal Illness

Ugh. It's happened to us all. Here's how to handle a bad belly when you're away from far from home.

Diarrhea

In all cases, give lots of fluids to prevent dehydration and pop an Imodium AD tablet. For more severe diarrhea, add electrolyte tablets, such as NUUN, to the water. Give him easily digested foods (such as rice or oatmeal); avoid fats, dairy products, and caffeine. If it's not under control within 24 hours, find a doctor—sooner if bloody bowel movements, fever, and pain exist.

Vomiting

Give as much fluid as the patient can tolerate and have him rest—but evacuate if the problem persists for more than 24 hours.

Wash Your Hands

A *Journal of Travel Medicine* report found that 61 percent of Appalachian Trail hikers who "rarely or never" washed their hands after a bathroom break got diarrhea, compared to just seven percent of those who did scrub. Here's how to wash up right:

- Wet hands (hot water is best) and add a drop of biodegradable soap.
- Work up a lather and scrub for 30 seconds—especially fingertips and under nails.
- Rinse, repeat, then dry hands with a bandanna reserved for this purpose.

Dental Emergencies

Soothe tooth pain with these helpful remedies.

Toothache Rinse your mouth with a solution of half a teaspoon of salt and eight ounces of water several times a day. If pain, sensitivity to hot and cold, and swelling exist, get to a doctor—it could be an abscess.

Broken tooth Rinse the tooth thoroughly with drinking water, and then protect the sensitive nerve by placing a chewed piece of gum over the break. Apply a cold-water bladder to the patient's cheek to reduce swelling, and take ibuprofen for the pain. Hike out to your dentist.

Snowblindness

Recognize: Redness, tearing, and a sandpapery pain when opening or moving the eye are signs of sunburned corneas.
Treat: First, don't let the patient rub his eyes; it could further damage the corneas. Give ibuprofen for the pain, apply a cold compress, and cover eyes with gauze. Wear sunglasses and stay in a dark environment until vision returns to normal (usually in about 18 hours).

Hypothermia

Recognize: The person complains of feeling cold and shivers. More advanced hypothermia patients exhibit "the umbles:" stumbling, fumbling, mumbling, and grumbling.
Treat: Get the patient into warm, dry clothes and place him in a sheltered area—such as in a sleeping bag, inside of a tent. (Don't have a tent? Protect him from the elements by wrapping the sleeping bag in a tarp, plastic sheet, or garbage bags.) Give water and simple sugars, such as hot chocolate or candy, to generate quick body heat. For more advanced cases, build a fire nearby and put the patient in a "hypothermia wrap:" Start with a sleeping pad, put a zipped sleeping bag on top, then lay the patient (in a second sleeping bag) on that. Give him a hot-water bottle wrapped in clothing to hold in his hands. Put another sleeping bag on top, then wrap it all, burrito-style, in a tarp or plastic sheet.

Stay or Go?

Use this chart to determine if you can finish your trip—or should hightail it to the ER.

Problem	Stick it out if . . .	Head for help if . . .
Hypothermia	Person warms up and feels fine	Pulse slows; shivering stops; person becomes incoherent or unconscious
Frostbite	Tissue warms and looks normal	Blisters or black tissue form
Heat illness	Person cools off and feels fine	Person has altered mental status and red, hot skin
Muscle/bone injury	Person can use the injured part	Person cannot use the injured part
Diarrhea	Problem resolves within 24 hours	Problem persists for more than 24 hours
Wounds	They are cleaned, properly dressed, and don't require closure	They are large enough to require closure; they're deep wounds on the face or neck
Burns	Pain is manageable and no large blisters form	Pain is intense; blisters are large; face is burned

Extreme First Aid

When you're miles away from medical help and it is serious: Here's how to handle extreme injuries in the backcountry:

Heart Attack

Look for chest pain that radiates to the shoulder, arm, or jaw (especially on the left side), nausea, lightheadedness, and pale, cool, sweaty skin. Keep the person comfortably at rest, cover him with clothing or a sleeping bag to prevent heat loss, and keep him as calm as possible. Give an aspirin tablet (to inhibit artery-clogging blood clots). Don't let the person walk. Get help.

Shock

Look for rapid, weak pulse; shallow breathing; clammy skin; and nausea. Caused by an inadequate flow of oxygenated blood, shock can result from any major injury, including blood loss, severe dehydration, and spinal cord damage. If the cause can be treated—such as rehydrating the dehydrated—do it. Put him in a sleeping bag or cover him with extra clothing. Keep the person calm and lying down on a sleeping pad with his legs comfortably elevated about 10 inches. If vital signs don't improve with treatment or the patient becomes less responsive, go for help. Left untreated, shock can be fatal.

Broken Back

Move the person as little as possible (if movement is necessary, don't bend or twist the spine). Place a SAM splint around the neck to restrict the head. Do not leave the patient alone. Have someone keep a hand on the person's head to discourage movement. Go for help.

Mushroom Poisoning

Treat all unknown mushrooms as deadly. Induce vomiting as soon as possible after ingestion by having the person stick a finger down their throat to stimulate the gag reflex. Give plenty of fluids to dilute the poison, keep a sample of the mushroom, and get to a doctor. Poisoning symptoms take six to 24 hours to appear—and by then, it's often too late.

Brain Injury

A blow to the head that results in unconsciousness often causes the brain to swell. Early signs include progressive disorientation, irritability, and combativeness (after consciousness returns). Evacuate the patient immediately. If he's unconscious, carefully roll him onto his side and go for help.

First Aid Improvisation

"Be prepared" is a great motto, but who packs a cervical collar on a backpacking trip? Many items can serve as medical equipment in a pinch.

Antacid: Eat two teaspoons of menthol toothpaste mixed with cold water.

Antibacterial Ointment: Use honey to discourage infection and promote healing. (it's a natural antibacterial agent). Spread it over the surface of minor cuts, burns, abrasions, and frostbite (but not directly in a wound) and cover with gauze.

Bandage: Cut a thin strip of fabric out of a T-shirt (snip in a circular pattern around the shirt to get the longest dressing possible).

Cervical Collar: Roll a bulky jacket or fleece, leaving the sleeves out, and wrap it around the patient's neck. Tie it in place with the sleeves. Or cut a foam pad into a collar and tape it in place.

Cold Pack: Soak the injury in cold water, or wrap soaked bandannas or cotton T-shirts around the site.

Irrigation Syringe: Force water out of a hydration tube or squeeze a zip-top bag with a pinhole poked in it.

Medical Gloves: Put your hands inside clean zip-top bags.

Sling: Pull the bottom of the patient's short-sleeve shirt up and over the injured arm and pin it to the front with two safety pins. Long-sleeve shirt? Pin the sleeve of the injured arm (with the arm in it) to the shirt.

Wound closure strips Cut 1/4-inch-long strips of duct tape; punch pinholes to let fluid drain.



Evacuate or Wait for Rescue?

Your buddy just slid down a steep scree and broke his leg. Should you go for help—or haul him out? It's a tough call. The answer depends on several factors. Here's how to decide.

Your buddy just slid down a steep scree slope and broke his leg. Should you go for help—or haul him out? It's a tough call. The answer depends on several factors. Here's how to decide.

How bad is it? Patients with life-threatening injuries should usually stay put and wait for trained medical professionals; those with less serious injuries can walk or be carried out. If the patient can handle it, walking out is the best option.

How far is the trailhead? One fit hiker can move a lot faster than a group carrying a litter. If you're deep in the wilderness, a messenger might bring back help before you could carry the patient out.

Can the rescuer(s) handle it? You'll need strength, stamina, and skill to navigate the terrain with an injured person in tow.

What's the weather like? Stay put if severe weather puts the rescuers in danger of getting lost or injuring themselves.

Is there imminent danger? Even severely injured patients might need to be moved if the current location is unsafe—e.g., lightning is striking or you're on an unstable slope.



Backcountry First Aid Kit

ID Card

On a 3" X 5" index card print the titles illustrated below legibly in black ink. Complete the cards with the requested information and in **RED** ink write your allergies. Laminate the card and place it in your personal first aid kit.

Front

Name: _____
Address: _____

Phone numbers: _____
DOB: _____
Insurance Co. & numbers: _____

Emergency contacts: _____

Back

ALLERGIES: _____
Medical conditions: _____

Medicines you take: _____



What to Pack

Emergency first aid in the wilderness begins with your own personal first aid kit. The kit should be small and waterproof. Doubled heavy-duty Ziploc bags or a waterproof ditty bag can be used. It should contain the essential medical instruments and bandage materials listed in the following chart. Asterisked items (*) need only to be carried by the group leaders. All medications should be stored in separate air-tight plastic containers and clearly labeled as to the name of the drug, dosage, and expiration date.

First Aid Kit Checklist

Bandage Materials		
Qty	Description	Uses
10	1" X 3" Band-Aids	Covering small cuts and scrapes
10	2" X 4" Band-Aids	Covering small cuts and scrapes
10	Butterflies	Close long cuts and wounds
4	Knuckle Band-Aids	Covering cuts and scrapes on knuckles
4	2" X 2" gauze pads	Used to cover wounds
4	4" X 4" gauze pads	Used to cover wounds
4	4" X 4" Telfa pads (non-adherent dressing)	Place directly on wound, under sterile dressings
1	2" or 3" gauze roll (self adhering)	Hold dressings in place
*2	Trauma dressings (surgipad or sanitary napkins)	Large wound or abrasion pressure dressing
9'	Duct tape (wrapped around a short pencil)	Hold dressings in place, preventing blisters
Wound Management		
1	.5oz tube triple antibiotic ointment	For cuts, scrapes, burns
1	Tincture of Benzoin	Increases the stickiness of wound closure strips
1	6oz bottle of camp soap	Cleansing wounds
Medications		
24	Ibuprofen tablets	Reduces inflammation, relieves pain
6	Immodium/Pepto-bismol tabs	Controls the symptoms of diarrhea
6	Antihistamine tablets (Benadryl or Sudafed)	For treatment of allergic symptoms
Blister Care		
1	Moleskin pad	For preventing and protecting blisters
1	Molefoam pad	For preventing and protecting blisters
Personal Protection		
*2	Nitrile examination gloves	To help prevent the spread of infectious disease
*1	Microshield CPR mask	To help prevent the spread of infectious disease
Hardware		
*1	Small scissors or trauma shears	Removing clothing, cutting bandages
1	Tweezers	Removing ticks or embedded objects
*1	Razor	Removing hair around wounds
6	Large safety pins	100's of uses
*1	Mirror	Removing specks in eye, signaling device
1	Whistle	Signaling device
1	Lighter/matches in waterproof container	Starting a fire, sterilizing instruments
Other Essential Items		
1	1.5oz SPF 15 sunscreen	Prevent sunburn
1	Lip balm tube with SPF protection	Prevent dry, chapped, sunburned lips
1	2-4oz tube of Insect repellent (DEET)	Repel mosquitoes, ticks, and flies
*1	Water purification tablet system	Emergency clean water supply

High Adventure Duty Roster

Crew Leaders:

	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7
Navigator							
Trashman							
Fireman							
AM Waterman 1							
AM Waterman 2							
AM Cook							
PM Waterman 1							
PM Waterman 2							
Mr. Clean							
PM Cook 1							
PM Cook 2							
PM Cook 3							
KP 1							
KP 2							
KP 3							

Crew Leaders: Ensure all participants are aware of their duties and that the duties are carried out. The crew leaders also participate in the duties.

Navigator: Goes over the maps the evening before their assignment with the adult leaders. Reports the next day's hike details to the group prior to bedtime. Leads crew decision making at trail crossings.

Trashman: Compacts and carries the day's trash. Responsible for organizing the clean-up of the campsite before leaving in the morning.

AM Cook: Immediately upon waking up, set up a stove and heat water for breakfast.

Fireman: Check fuel level in fuel bottles and adjust as necessary. Set up and light stoves at the appropriate time for cooking under orders of the cooks. Break down and store stoves and fuel bottles after KP is done.

Watermen (AM): Prior to breakfast, collect and fill all crew water bottles as necessary.

Watermen (PM): Immediately after camp is set up, fill crew water bladders with filtered water as necessary. Collect and fill all crew water bottles as necessary. Be available if needed during cooking and KP

Mr. Clean: Responsible for filling and hanging shower/wash bags in an appropriate area immediately after setting up camp. After bathing is done, empty the bags, turn inside out, and set out to dry.

PM Cooks: Cook 1 is in charge. Lead the other cooks, fireman and watermen in getting dinner done. Rehydrate food and get water boiling in a timely manner. Cook according to package instructions. Serve food to the crew, being careful of not spilling food. Control the cooking area. Keep others out of the way unless they are assisting.

KP: KP 1 is in charge. Clean out all cooking pots as completely as possible before dish washing begins. Prepare large pot of water for heating. Use a large cooking pot as wash pot and another pot as a rinse pot. Wash all personal gear before crew gear. Dispose of wash water appropriately. Lay out all cookware to dry overnight

Crew duties sequence upon reaching camp:

1. Locate the "bearmuda" triangle at camp - bear canisters, cooking, and sleeping area.
2. Set up the crew fly in the cooking area, if necessary.
3. Place all crew gear and bear canisters in the cooking area.
4. Set up personal tents and stow all personal gear.

Crew duties before going to bed:

1. Place all personal smellables in the bear canisters and store for the night.
2. Take down crew fly.
3. Pack all personal and non-smellable crew gear possible.

Crew duties before hiking in the morning:

1. Immediately upon awakening pack all personal gear, take down and pack tents if dry.
2. After breakfast, pack bear canisters and crew gear.

Any crew gear you carry is yours to carry for the entire trek. Remember what you are carrying in case it is needed in an emergency.

Leave No Trace Principles

The tremendous rewards of high-adventure treks are drawing more and more people to the backcountry. At the same time, the vast territory suitable for treks is shrinking in size. More people and less land mean we all must be careful not to endanger the wild outdoors we have come to enjoy.

A High-Adventure Ethic

A good way to protect the backcountry is to remember that while you are there, you are a visitor. When you visit a friend you are always careful to leave that person's home just as you found it. You would never think of dropping litter on the carpet, chopping down trees in the yard, putting soap in the drinking water, or marking your name on the living room wall. When you visit the backcountry, the same courtesies apply. Leave everything just as you found it.

Hiking and camping without a trace are signs of an expert outdoorsman, and of a Scout or Scouter who cares for the environment. Travel lightly on the land.

The Principles of "Leave No Trace"

"Leave No Trace" is a nationally recognized outdoor skills and ethics education program. The Boy Scouts of America is committed to this program. The principles of Leave No Trace are not rules; they are guidelines to follow at all times.

The Leave No Trace principles might not seem important at first glance, but their value is apparent when considering the combined effects of millions of outdoor visitors. One poorly located campsite or campfire is of little significance, but thousands of such instances seriously degrade the outdoor experience for all. Leaving no trace is everyone's responsibility.

Plan Ahead and Prepare

Proper trip planning and preparation helps hikers and campers accomplish trip goals safely and enjoyably while minimizing damage to natural and cultural resources. Campers who plan ahead can avoid unexpected situations, and minimize their impact by complying with area regulations such as observing limitations on group size.

Proper planning ensures:

- Low-risk adventures because campers obtained information concerning geography and weather and prepared accordingly.
- Properly located campsites because campers allotted enough time to reach their destination.
- Appropriate campfires and minimal trash because of careful meal planning and food repackaging and proper equipment.
- Comfortable and fun camping and hiking experiences because the outing matches the skill level of the participants.

Camp and Travel on Durable Surfaces

Damage to land occurs when visitors trample vegetation or communities of organisms beyond recovery. The resulting barren areas develop into undesirable trails, campsites, and soil erosion.

Concentrate Activity, or Spread Out?

In high-use areas, campers should concentrate their activities where vegetation is already absent. Minimize resource damage by using existing trails and selecting designated or existing campsites. In more remote, less-traveled areas, campers should generally spread out. When hiking, take different paths to avoid creating new trails that cause erosion. When camping, disperse tents and cooking activities-and move camp daily to avoid creating permanent-looking campsites. Always choose the most durable surfaces available: rock, gravel, dry grasses, or snow.

These guidelines apply to most alpine settings and may be different for other areas, such as deserts. Learn the Leave No Trace techniques for your crew's specific activity or destination. Check with land managers to be sure of the proper technique.

Pack It In, Pack It Out

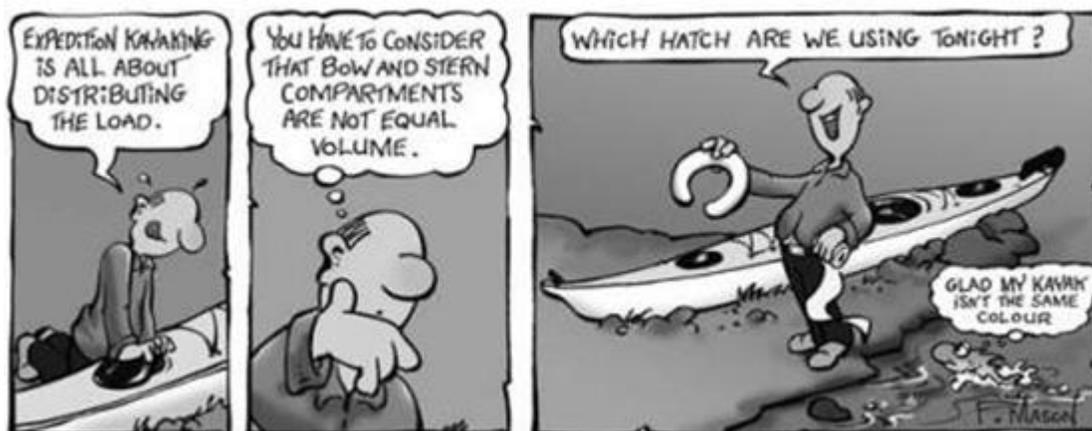
This simple yet effective saying motivates backcountry visitors to take their trash home with them. It makes sense to carry out of the backcountry the extra materials taken there by your group or others. Minimize the need to pack out food scraps by carefully planning meals. Accept the challenge of packing out everything you bring.

Sanitation

Backcountry users create body waste and wastewater that require proper disposal.

Wastewater. Help prevent contamination of natural water sources: After straining food particles, properly dispose of dishwater by dispersing at least 200 feet (about 80 to 100 strides for a youth) from springs, streams, and lakes. Use biodegradable soap 200 feet or more from any water source.

Human Waste. Proper human waste disposal helps prevent the spread of disease and exposure to others. Catholes 6 to 8 inches deep and 200 feet from water, trails, and campsites are often the easiest and most practical way to dispose of feces.



Leave What You Find

Allow others a sense of discovery: Leave rocks, plants, animals, archaeological artifacts, and other objects as you find them. It may be illegal to remove artifacts.

Minimize Site Alterations

Do not dig tent trenches or build lean-tos, tables, or chairs. Never hammer nails into trees, hack at trees with hatchets or saws, or damage bark and roots by tying horses to trees for extended periods. Replace surface rocks or twigs that you cleared from the campsite. On high-impact sites, clean the area and dismantle inappropriate user-built facilities such as multiple fire rings and log seats or tables. Good campsites are found, not made. Avoid altering a site, digging trenches, or building structures.

Minimize Campfire Use

Some people would not think of camping without a campfire. Yet the naturalness of many areas has been degraded by overuse of fires and increasing demand for firewood.

Lightweight camp stoves make low-impact camping possible by encouraging a shift away from fires. Stoves are fast, eliminate the need for firewood, and make cleanup after meals easier. After dinner, enjoy a candle lantern instead of a fire.

If you build a fire, the most important consideration is the potential for resource damage. Whenever possible, use an existing campfire ring in a well-placed campsite. Choose not to have a fire in areas where wood is scarce-at higher elevations, in heavily used areas with a limited wood supply, or in desert settings.

True Leave No Trace fires are small. Use dead and downed wood no larger than an adult's wrist. When possible, burn all wood to ash and remove all unburned trash and food from the fire ring. If a site has two or more fire rings, you may dismantle all but one and scatter the materials in the surrounding area. Be certain all wood and campfire debris is dead out.

Respect Wildlife

Quick movements and loud noises are stressful to animals. Considerate campers practice these safety methods:

- Observe wildlife from afar to avoid disturbing them.
- Give animals a wide berth, especially during breeding, nesting, and birthing seasons.
- Store food securely and keep garbage and food scraps away from animals so they will not acquire bad habits.
- Help keep wildlife wild.
- You are too close if an animal alters its normal activities.

"Leave No Trace" Information

For additional Leave No Trace information, contact your local land manager or local office of the Bureau of Land Management, the Forest Service, the National Park Service, or the Fish and Wildlife Service. Or, contact Leave No Trace at 800-332-4100 or on the Internet at <http://www.lnt.org>.

For posters, plastic cards listing the Leave No Trace principles, or information on becoming a Leave No Trace sponsor, contact: Leave No Trace Inc., P.O. Box 997, Boulder, CO 80306, phone 303-442-8222.

Respect Others

Thoughtful campers:

- Travel and camp in small groups (no more than the group size prescribed by land managers).
- Keep the noise down and leave their radios, tape players, and pets at home.
- Select campsites away from other groups to help preserve their solitude.
- Always travel and camp quietly to avoid disturbing other visitors.
- Make sure the colors of their clothing and gear blend with the environment.
- Respect private property and leave gates (open or closed) as found.
- Be considerate of other campers and respect their privacy.

