

**Illustrated**

# **Backpacking Handbook**





**Illustrated**  
**Backpacking**  
**Handbook**



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# Introduction



What could be more adventurous than to put all the gear you'll need on your back and head off into the woods? Wilderness adventure trips are fun and help you learn all sorts of new skills. The confidence you will gain in the outdoors will help you throughout your life.

The purpose of outings includes earning merit badges, rank advancement, and developing new skills. Activities can include not only hiking, backpacking, camping, and cooking, but also things like cycling, swimming, snorkling, fishing, rafting, kayaking, and rock climbing.

However, it's not smart to just head off into the woods without some preparation. The boy scout motto is "Be Prepared." "Be prepared for what?" someone once asked Lord Robert Baden-Powell, the founder of Scouting, "Why, for any old thing," he replied. A well-trained, well-equipped boy scout makes a smart outdoorsman.

Boy scouting is designed to take place outdoors. It is in the outdoor setting that scouts share responsibilities and learn to live with one another. It is here that the skills and activities practiced at troop meetings come alive with purpose. Being close to nature helps boy scouts gain an appreciation for God's handiwork and humankind's place in it. The outdoors is the laboratory for boy scouts to learn ecology and practice conservation of nature's resources.

This guide is intended to give a young or aspiring scout, and his parents, as much information as possible to make those first few forays into the great outdoors more safe and a lot more fun! If you're not comfortable, you won't enjoy the beauty of nature and the fun activities of the troop.

So let's get started with the basics, and we'll try to pick up a few neat tricks along the way!

## **A Typical Backpacking Trip**

During the troop meeting before the outing, all the scouts who are going on the trip will meet in patrols. At the meeting, several issues will be decided: the complete menu will be written, a duty roster with each job assigned, and arrangements will be made regarding shopping for food. Each patrol will be assigned a tent, a stove, and a cookset by the quartermaster.

Each trip has an associated fee for food. Be prepared before the troop meeting to bring \$20 cash or check for each person going on a typical weekend backpacking trip for food from Friday

See our website at  
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for more  
information about  
our troop!

dinner through Sunday lunch. If your son doesn't bring money for the trip, he won't get to go. If he doesn't participate in troop meetings, he won't get to go either. Be sure to follow instructions for permission slips or medical clearance forms, as well.

It's a good idea to assign duties based on if anyone needs to perform certain duties in order to advance in rank. So cooking a meal, planning a menu, doing shopping, sorting out cooking gear are all things that can be signed off for the scout who successfully performs these duties.

Scouts that do the shopping will need to prepare the food correctly for backpacking. This includes removing some of the heavy packaging and repackaging some items. The food should be then sorted into individual food bags, one for each member of the patrol. Everyone should carry something, and the weight should be roughly even.

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for an Adult and  
Youth Application  
Form!

Scouts should weigh their packs at home on a scale with the goal of being under 25% of their body weight. Remember, you will need to leave room for patrol gear, food, and tents. Every scout should show up at the event ready to go. If we are leaving on a Friday evening, each scout should have already eaten dinner before arriving at the meeting location or should bring a sack dinner to be eaten later. Not every driver allows food or drinks in their car, so be forewarned.

As the troop prepares to leave, each scout will receive some patrol items, such as stove, a pot, water purifiers, tent poles, or other gear. After a pack inspection by the adult leaders, everything will be loaded up, and we'll head out for the trailhead.

If we've left on a Friday evening late, we'll be staying at a base camp the first night, then packing up all our gear and hitting the trail in the morning. If we leave early Friday afternoon, we'll go directly to the start of the trail and make some headway before dusk.



Each scout will be given a copy of a topographic map that shows our route. We will be making sure that every scout is drinking enough water on the trail. About ten minutes into each leg of our hike, we stop briefly to allow for removing warmer layers and adjusting straps and gear. Then we try to establish a consistent pace.

At night, after setting up tents, making dinner, and cleaning the dishes, the scouts will pull all their food and smellables out of their packs and put them in their bear bags ready to hang. It's free time until bedtime. No scout is allowed to leave the campsite after dark. If a scout needs to heed the call of nature, he must go with a buddy.



It's up early the next morning by first light so we can eat, strike our camp, and get on the trail. Immediately on waking, each scout should stuff his sleeping bag and start getting his gear organized. Often scouts wake up a little cold, so this activity helps them warm up. It also gets the packing started quickly. After patrolling the campsite for any litter, we'll leave the campsite as soon as possible.

When we return to the city, no one leaves the troop return point until all the gear is accounted for and returned. We've been very fortunate that our equipment has lasted as long as it has, and we believe it's because we take care of it. After all the patrol gear is stowed, each scout can be picked up by their parents. If the trip involved rain, scouts may be asked to take a tent home to dry out and bring back. Parents, please do not come early, or try to take your son before the gear is put away. Many volunteers have spent their entire weekend helping your son enjoy the outdoors; the least you can do is help them by giving your son an extra 20 minutes to finish the job right.

See our website at  
**www.Troop486.net**  
for some photo  
galleries of our past  
trips!

If you have any pictures of the trip, it's always nice to include them in the troop history. Bring a CD-ROM or DVD to the next troop meeting, and we will upload the images to the troop's internet photo gallery. Upon our return, mileage is documented for each participant. Scouts and adults are awarded patches earned during the trip.

## **Types of Outdoor Activities**

### Day Hiking

A typical annual calendar of outdoor activities for a troop will usually include several day hikes during the year. These are one-day events that will last perhaps three to seven hours and are designed in part as physical conditioning to prepare for more difficult activities later in the year. For most day hikes you will not be carrying as much as you would on an overnight hike. You just need enough to handle any changes in temperature, weather, and terrain while not going overboard and carrying so much that your pack is unnecessarily heavy or uncomfortable.

### Backpacking

Backpacking trips are overnight and can last from one weekend up to one week long. Therefore backpacking will involve one or more "legs" of travel with one or more wilderness campsite destinations. These trips involve carrying on your back just about everything you will need, including food, clothing, and shelter.

Older boys who qualify for high adventure activities will have an opportunity once a year to go on a week-long backpacking trip of 50+ miles. Some examples of these trips include kayaking around the perimeter of Catalina Island or trekking into the High Sierra.

### Base Camping

Other terms for base camping are car camping, tailgate camping, and frontcountry camping. Base camping is done at a drive-in campsite area. The camp is used as a base from which day hikes can be launched. Because vehicles bring our gear close to our campsite, there are fewer limitations on the weight and bulk of what we can bring. Ice chests with perishable or chilled foods, folding chairs and tables, canvas cots to sleep on, tarps or awnings for shade, multi-burner camp stoves and kitchen set-ups, etc., can be included in this type of activity.



### Parent Transportation and Participation

Scouting runs on the energy of volunteers. Parent involvement is needed and wanted. If you would like to help, step forward because we will welcome your participation. Anyone can be involved. As you become more involved, there will be lots of opportunities to have fun and to learn.



If you are joining the troop, consider purchasing a National Forest Adventure Pass, available at national forest offices and many outdoor retailers in the local area. There is a fee for this. You can purchase a one-day pass or an annual pass. This tag hangs from your rearview mirror and allows you to park in wilderness areas of Southern California. Without it, you may be fined. If you are just starting out on a first trial outing with our troop, the leaders have additional Adventure Passes to loan you.

A California Campfire Permit, also from the National Forest Service, is required not only for campfires but also camping stoves and backpacking stoves in wilderness areas. There is no charge for this permit, but without one, a ranger may give you an expensive citation.

### Planning

The most important element of getting out into the great outdoors is planning. Much of the planning of any troop activity will be coordinated at the troop level by the scoutmasters. However, it is also important that the scout think ahead, so that assembling the right set of equipment and packing aren't left until the last minute.

See our website at  
**www.Troop486.net**  
for locations to buy  
your Adventure  
Pass!

A checklist is available from the troop for preparing before each outing. We strongly recommend using this checklist so that you avoid forgetting some important item, without which your scout may have an uncomfortable trip.

Planning for a trip not only includes assembling gear but also spending a little time on a number of minor but important tasks that will make your trip go smoothly. These include checking and maybe replacing supplies in your personal first aid kit, checking and maybe replacing batteries in your headlamp, replenishing sunscreen and insect repellent, and filling your hydration containers.

## **Group Equipment**

Some of the equipment needed on our hiking, camping, and backpacking trips will be routinely supplied by the troop. These generally are items that are used by the group as a whole. These will be checked out with the quartermaster and assigned to patrols. Alternatively, adult participants may provide their own gear.

2-way radios	Tents
Backpack stoves	Tools like axes or shovels
Canopies or kitchen tarps	Troop first aid kit
GPS	Water filters
Rope	

## **What Not To Buy**

While your scout will need some personal equipment for hiking and backpacking that you will have to purchase early, there are other items we will discuss in this handbook that are either not necessary for a scout at first, or not necessary at all.

A scout need not buy any of the equipment we bring as a troop. These are items that are either quite heavy, are used rarely such as in emergencies, or are managed by the adults. These include the items in the previous section. Some equipment is divided among the scouts in a patrol to carry and these are purchased by and provided by the troop. These include tents and stoves. Parents who accompany us on our outings are welcome to purchase these items for their own use. We have in our inventory and can loan your scout an external frame backpack for use while he is in the troop or until you choose to purchase one. In our troop, your scout does not need his own tent or backpacking stove at any time. Other items should be purchased only after some learning about the choices available.

Such items you should wait to purchase include: backpack, compass, first aid kit, head lamp, hydration system/pack, knife, rain suit, trekking poles.

For purposes of scouting, please do not buy the following items for your scout at any point: expensive knife, expensive boots, sleeping bag stuffed with down, tent.

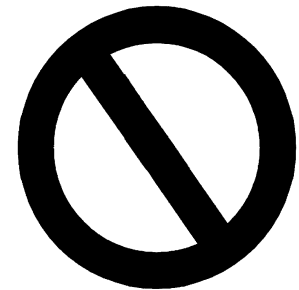
## **What You Must Have**

Each of the following items are absolutely required on any backpacking trip. The only way to stress the importance of this list is without all these items, we will actually send you back home from the staging area to get them.

- Backpack
- Daypack
- Sleeping bag (with synthetic insulation)
- Foam pad
- Hiking boots (no sneakers)
- Wool or synthetic hiking socks (no cotton)
- Broad brimmed hat
- Synthetic jacket
- ONE additional change of clothes (synthetic)
- Water (one quart in plastic bottle)

Please note that requirements will be different for day hikes, basecamps, and the extreme conditions of summer and winter.

## **Useless Things Scouts Should Not Bring Hiking or Camping**



New scouts in particular are prone to both underpack and overpack. There are many items that novice backpackers are likely to consider bringing on a trip that are not only extra baggage but actually useless. Among them are the following items most commonly brought on trips that are never used. If in doubt about an item that is not on this list, please check with your scoutmaster first.

Useless items:

Anything made of cotton	Family band radio
Boots or shoes with holes	Fixed or sheath knife
Canvas tennis shoes	Flares
Canvas tent	Global positioning system
Cell phone	Metal mess kit
Cotton gloves	Metal, glass, or canvas canteen
Cotton sleeping bag	Sleeping bag with broken zipper
Cotton denim jeans	Tent with broken zipper
Cotton socks	Two-liter bottle of soda
Cotton sweatshirt or hoody	Walkie-talkie
Cotton thermal underwear	Wet down sleeping bag
D-cell flashlight	

## Assembling Your Gear

For some, the idea of “gearing up” is an adventure all it’s own! For others, it can be an intimidating, and expensive, experience. We’re going to talk about the gear that is necessary for a scout to have a good first experience, ways to do it inexpensively, and some smart first purchases once a scout has decided that he’s going to stick with backpacking for some time.

Gear selection tends to be a very personal thing. What works well for someone else may not work well for you, and what works well on one trip may be entirely unsatisfactory on another trip. Read the information provided here on gear options. Check what other people have to say on the subject. Then decide what you think is going to work best for you, and give it a try. As you gain experience you will be better able to evaluate what others have to say about gear choices and functionality.



One part of the scout law is “A Scout is Thrifty.” Do not begin by buying a lot of expensive, high-tech gear. For example, individual scouts will not need their own tent or camp stove; these are bought and issued by the troop to patrols. Our troop has a supply of backpacks. The troop quartermaster, a scout position, is responsible for the troop’s available inventory of gear. He can arrange for your to loan a backpack. Go on a few outings. Serious hiking and backpacking are strenuous and not for everybody. Wait to see if you like our troop’s type and schedule of activities first. Also, items like a GPS or walkie-talkies are not needed by individual scouts.

Some retail camping equipment stores, like REI, have departments where you can rent some of the larger items you might want to try before buying, such as a backpack or sleeping bag. Renting is an excellent way to get acquainted with the different types of equipment and find out if backpacking is going to be fun for you. Rent for the first couple of weekend trips, it could save you a lot of money in the long run.

Acquiring gear is best done slowly over a period of time. On outings, begin to observe what the other scouts’ gear is like. Ask questions and learn what would work best for you.

When you do decide to buy, comparison shop. Consider buying some gear through e-Bay second hand. Retailers, like Sport Chalet, Big 5, REI, and Bass Pro Shops, are a great place to go and look at gear up close and try it out. Don’t be shy about trying out gear in the store; in fact, you may well see customers right in aisles crawling into tents, zipping up in sleeping bags, or walking around wearing a backpack. Many product reviews and comparisons are available on the internet from which to learn about gear and find discounts.

When it comes to purchasing equipment, many items can be acquired inexpensively, but avoid buying a cheap backpack or a cheap sleeping bag. With these items, the quality is worth the investment. On the other hand, avoid lavish spending on footwear, which a scout will grow out of several times during their tenure in scouting. Be sure to put identification marks on your scout's gear in the event that it is lost or mixed with other scout's gear.

See our website at [www.Troop486.net](http://www.Troop486.net) for links to backpack weight and volume calculators!

## **Weight Management**

Lighten up. It's simple: carry less, go further. No one is suggesting you shouldn't bring your camera, extra clothing, or a first aid kit, but every pound you carry will affect your trip. The objective is to optimize speed and endurance without compromising comfort or safety. Lighter weight increases agility and decreases fatigue, soreness, and injury. Lighter weight also results in less environmental impact off-trail.

New scouts can be prone to simultaneously over-pack and under-pack. They may take too many inessentials and at the same time forget something obvious. But beginning backpackers should pack relatively light. It's always easier to add a few extra things the next time than to carry an extra five pounds on your first trip.

Please do not send your scout on a backpack with five changes of clothing and ten pairs of underwear. Let clothes do double duty wherever possible. Two changes of clothes will be plenty: one change to wear and another change to wash.

Before most trips, we will conduct a pack check. This involves each scout presenting his backpack ready to go several days beforehand. We will inspect the contents, weigh the pack fully loaded, and sequester it until the day of the trip.

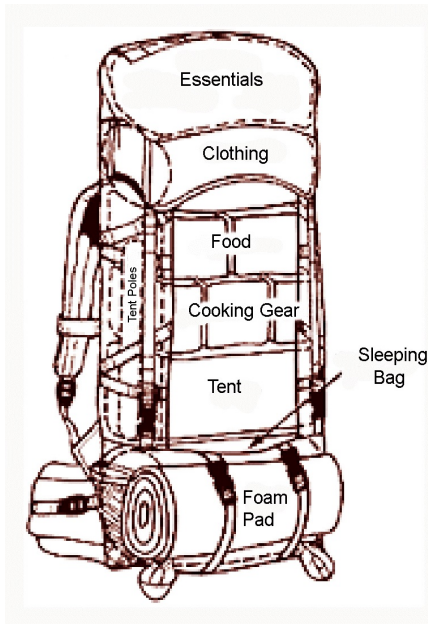
What gear is necessary is dictated chiefly by the nature of the trip, its duration, the terrain, and the weather. The heaviest items are where the greatest economy can be obtained: the pack itself, the sleeping system, and the shelter. Each need be no more than three pounds in weight. Eliminate redundancies and maximize gear that afford multiple applications. Many small weights add up to a single large weight once they are on your back. Bear in mind that consumables will decrease over the course of a trip. For example, a one-liter/32-ounce lexan Nalgene water bottle, weighing about seven ounces empty, approaches three pounds filled.

So, how much weight are you expected to carry in your pack? A typical example weight is 20 pounds without food or water. A good rule of thumb for scouts is that you should not carry any more than one quarter of your body weight. This can be difficult for younger boys who may only weigh 70 or 80 pounds. On the other hand, just because a scout may weigh 180 pounds does not mean he should be carrying forty pounds or more. Under no circumstances, though, should a boy carry a pack more than the equivalent of one-third his total body weight.

## Backpack Organization

A backpack should be packed in such a manner that a scout can get to the contents easily. Typically this means putting in last the things that will come out first.

Items frequently used on the trail that should be readily accessible include water and snacks, sunscreen and insect repellent, pocket knife and personal first aid kit, and fleece and shell. Put these in easily accessible locations—right next to side zips, in the pack lid pocket, in a side pocket or waistbelt pocket, etc. Also, pack your rain gear and tent where you can reach it fast in a sudden storm without having to pull out all the rest of your gear, such as on the top of your pack.



Organizing gear into types or categories by function has several advantages. It's easier to remember all of the individual items, it helps keep related gear together, and it can help better manage pack weight. Pre-pack clothing and food in separate ziplock bags. Color-coded stuff sacks make it easy to locate gear items and are an especially useful way of keeping track of smaller items.

If your pack doesn't have a framesheet between you and your gear, make sure you pack sharp and hard objects away from your back, preferably toward the outside of the pack. Such items include stove, cook pots, water & fuel bottles, and tent poles & pegs. A closed-cell sleeping bag pad can be inserted and unrolled into a top-loading pack for increased cushioning.

If your pack doesn't have a bottom compartment for your sleeping bag, and if you are on the trail for extended periods, you might want to consider putting your sleeping bag up toward the top of your pack. Putting your bag at the bottom with all the rest of your gear on top of it won't help your bag's lofting ability.

Lastly, anything tied to the outside of your pack, such as a frying pan, trek poles, or sleeping pad, should be secured with clips or straps to avoid swinging loose.

## Weight Distribution

Most of the weight of a backpack should be placed on your hips—not your shoulders or your waist. Comfort-test your pack—could you carry it all day long?

A pack should be packed to balance the weight of items in the pack. If mainly on the trail, especially for long distance treks, pack heavier items in the upper portion of the pack, in order to

create a higher center of gravity. This centers the pack weight above your body where it's easier to carry (on easy-to-moderate tread). On the other hand, if off-trail, pack heavier items close to the back in the middle portion of the pack. This will result in better stability when boulder hopping or post-holing.

Strive for an even left-right distribution of weight, so that one side of the pack isn't heavier than the other. You should keep the weight centered so that you don't lose your balance or hurt your back.

Slimmer is better. Cinch down the pack's compression straps as you pack to help ensure a slim pack profile. As it becomes apparent that you will need more space, loosen the compression straps accordingly. When all packed, cinch down all compression straps and load stabilizers, in order to ensure a secure, stable load. Remember, the fatter your pack, the farther you must lean forward to bring the pack's center of gravity back over your hips.

Lastly, throughout your trip, ease the potential for strain by periodically adjusting the straps to shift the load.

## **Maintenance of Your Gear**

Now that you have your gear, keeping it well-maintained and in good repair is an important part of safety management in the troop. Know how your gear works and be able to assemble, use, and disassemble it all—even in the dark.

Can you repair a ruined sleeping bag zipper? Do you know how to disassemble a clogged backpacking stove? Can you mend a detached boot sole? How would you handle a broken tent pole. What if a tent seam tears? What would you do if a strap on your daypack separates.

Be prepared to make some simple repairs in the field, so consider bringing a few spare parts. Classic repair problems include zippers, tent poles, boot laces, backpack straps, and stoves. A camp stove will be of no use unless you understand not only how to set it up and start it but also how it works and effect some simple repairs if it fails to work in the backcountry. Read the manual, take it apart a few times, and practice some simple repairs. Tent seams should be treated with a waterproof sealant, even if a tent is advertised as “waterproof.” This can be done even during an outing, whenever your tent is pitched in dry weather and you have a few minutes. Some tents are made of silicone-treated nylon and need a special silicone-based sealer that will adhere to this material.



Your repair kit may include:

Boot laces	Sail needle and monofilament thread
Buttons	Split rings
Cable ties	Tent patch glue
Clothing glue	Trash bag
Duct tape or gaffers tape	Velcro strapping
Nylon cord	Zipper pulls
Safety pins	

During your outing, keep your tent swept out because dirt under you and your sleeping bag slowly grinds away at the tent floor. Isolate wet and muddy gear. Place boots at the entry or in the vestibule. Assemble and disassemble tent poles with care because poles can chip, dent, and break. Cords stretch. Keep tent poles and stakes in separate sacks because they can tear or poke holes in the tent material.

When you get home from a trip, don't store your tent, sleeping bag, backpack, or boots wet. Clean and thoroughly air dry these in order to avoid the destructive effects of mildew. Don't leave your gear in the sunlight for prolonged periods of time because UV rays break down both the fabric and the waterproofing.

Avoid storing your sleeping bag compressed in its stuff sack as this will slowly break down the ability of the fill to loft and insulate. Down sleeping bags and down-filled jackets should be unstuffed and fluffed. Store your sleeping bag loosely rolled up in a large breathable storage sack or hung up in a closet if you have space. Down can take up to a week to dry. These items only need cleaning every few years. If your sleeping bag gets very dirty, you can wash it according to manufacturers instructions, usually in cool water with a mild, fragrance-free detergent. Use a second rinse cycle. Washing may cause the fill to clump, so dry it in a commercial-sized drier on the coolest setting with several tennis balls to fluff back the fill. Drying may take from 2 to 5 hours. Some wilderness outfitters offer a sleeping bag cleaning service. Never dry clean a sleeping bag.

See our website at  
**[www.Troop486.net](http://www.Troop486.net)**  
for helpful YouTube  
clips on gear repair!

Water filters need maintenance between outings. If you use a hydration system, you must clean and dry the bladder and hose after each outing. Some manufactures recommend pumping diluted bleach solution through the tubing before drying. Water containers should be emptied, washed with soap and water, rinsed, and dried, then stored with their caps off.

After a muddy or wet hike, boots should be cleaned with a stiff brush or washed with water and soap, dried out slowly, and snow-sealed. You should wear them once or twice a month to keep the leather supple. Crumpled newspapers or baking soda sprinkled inside helps absorb moisture and odors.

Replenish anything you used in your first aid kit, such as ibuprofen, antibiotic cream, moleskin, sunscreen, insect repellent, or bandages. Lastly, you should replace any worn or broken items in your equipment, like shoe laces or tent poles, so you're ready to go next time around.

When your outing is over, take a good, hard look at your gear and ask, "Is there any item that I used rarely, once, or not at all? Is it really contributing to my comfort and safety?" If not, consider not taking it in the future. But think carefully, unexpected conditions are common in the outdoors.

## **Adjustment to Backpacking**

Hiking with a pack is much different from walking without one. A pack on your shoulders alters your sense of balance. Its weight puts more strain on your feet, ankles, and knees. Take it easy at first until you become accustomed to the sensation, allow time for your muscles to warm up and your pack to settle into place, and rest whenever you begin to tire. Never hike to the point of exhaustion; you may need those reserves of energy to meet unexpected situations. Too frequent rest stops may be a sign of too rapid a hiking pace. If you can't talk and hike at the same time, your pace is too fast.

Acclimation to exertion, heat, and altitude all require time and pacing. Outings are usually sequenced to develop this acclimation. Usually those trips scheduled early in the year are intermediate in degree of difficulty for purposes of conditioning and training. Over the course of the year, our endurance and speed will be challenged, and pack weight and elevation gains will increase. Adult leaders are making observations and assessments of not only fitness, but also attitude, coping behavior, and equipment. Most high adventure trips of a week duration or so will be for first class scouts and above, because these scouts are prepared with the necessary physical strength, mental and emotional maturity, outdoor skills in first aid, knots, etc., and have prior long-term camp experience.

## **Fitness Training**

Acclimation is a very important factor for an enjoyable hike. Acclimation is the process of becoming adjusted to an unfamiliar environment or new conditions. In scouting, we may need to acclimate to the physical demands of new weather, terrain, or altitude. If we don't prepare by acclimating, we may suffer injury, dehydration, or altitude sickness.

Your personal physical fitness is an important factor in overall troop risk management and prevention. It is important that you not overestimate your ability to manage an outing that involves hiking, backpacking, or other strenuous activity with our troop. As always, if you have not been cleared by a physician, do so first before starting any rigorous program of physical activity. Consult an adult leader if you are unsure of your abilities to manage a particular trip. You do

See our website at  
**[www.Troop486.net](http://www.Troop486.net)**  
to download a copy  
of the Annual Health  
and Medical  
Record!

not want to find out that you are in over your head when you are out on the trail deep into the trip and pushing beyond your limits just to keep up.

The BSA requires a completed medical record and treatment consent, and this should be carried not only by the adult leadership on an outing but also on the scout himself with his first aid kit so that if he is separated from the troop and needs medical attention, it will be given in a timely manner.

While this may sound trite, both adults and youth should make adequate preparations for a first and subsequent outings that involve physical exertion. Our hikes will typically range in length anywhere from 3 to 14 miles in a day. Some hikes involve significant changes in altitude. Hikes typically will last for hours.

You should be involved in some type of aerobic, strength, and endurance conditioning. Cross-train with activities you enjoy. Do plenty of walking, but supplement your program with other exercise, for example cycling or swimming. If weather is a restricting factor for your work-outs, get into the gym. Training on cardio machines (e.g. treadmill, stairmaster, rowing machine) is not a perfect substitute for the equivalent exercises outdoors, but nevertheless improves your aerobic capacity.

If you are just starting, start slowly, in order to avoid injury and soreness. Once you are ready, increase your exertion level, but not to the point of exhaustion. Build up endurance. For training purposes, the speed you go isn't as important as the duration and pace. If progress is slow, you may find that changing your training a bit will increase your progress a lot. It is also important to start hiking. Vary your exercise in distance and terrain. Once you're ready, get out and take a lengthy hike. Keep a good pace and carry a pack, as our hikes are typically fast and strenuous for those not prepared. If hiking isn't a feasible option at this point, cycle instead.

Gauge your progress. Periodically monitor your heart rate, and make sure you're within your training zone. You can calculate this from charts in fitness books or gyms. The formula for your theoretical maximum recommended heart rate is 220 minus your age. Start at 60% of this, then 75%, then 85%. Be careful not to over-train. The last thing we need is for you to show up injured. Remember, this is only a rough guideline. You may have a different program that works for you. And keep yourself fit in the off-season as well.

## Height and Weight Restrictions

These recommended height/weight guidelines are used at the national Philmont Scout Ranch in New Mexico to restrict who may participate in strenuous backcountry outings. We ask parents of scouts in our troop to use similarly good judgement in determining if they themselves and their sons are able to participate in strenuous outings with us.

HEIGHT (FT/IN)	WEIGHT (LBS)	MAX
5' 0"	97-138	166
5' 1"	101-143	172
5' 2"	104-148	178
5' 3"	107-152	183
5' 4"	111-157	189
5' 5"	114-162	195
5' 6"	118-167	201
5' 7"	121-172	207
5' 8"	125-178	214
5' 9"	129-185	220
5' 10"	132-188	226
5' 11"	136-194	233
6' 0"	140-199	239
6' 1"	144-205	246
6' 2"	148-210	252
6' 3"	152-216	260
6' 4"	156-222	267
6' 5"	160-228	274
6' 6"	164-234	281
6' 7"	170-240	295

## Rest Step and Lock Step

Techniques for optimally managing your energy and avoiding injuries on the trail when you are at high altitudes, dealing with steep grades, or in snow, are the “rest step” and the “lock step.”

### Altitude

Most people live at or near sea level; much of the desert Southwestern United States sits at 4000 feet above sea level and higher. Even much of the eastern Phoenix valley varies in elevation from 1200 to 1600 feet! The South Rim of the Grand Canyon is at 7000 feet and the Colorado River is 2400 feet above sea level! This entire region will be high elevation hiking for most of you. Therefore, the air will be thin and oxygen will be at a premium just when you need it most!

When in high altitude, you have to breathe more to get the same amount of oxygen that you would at lower elevations. This combination ends up being very tough on people who don't know how to hike correctly in these conditions. If you insist on trying to maintain a relatively fast pace, your breathing becomes labored, you feel your heart pounding in your head, and you start building up lactic acid in your muscles! Lactic acid is responsible for that burning sensation in the muscles when you're exercising hard. You don't have to get it so badly while you're hiking though!

### Steep Grades

While hiking uphill, you are using your large muscles, the quadriceps (thigh muscles) and your gluteus maximus (butt muscles). These are very strong muscles which shouldn't have any trouble carrying your weight and your pack weight; however, they also require a good, steady supply of oxygen during exercise.

### Snow

Hiking in snow is like running in sand at the beach. If you are at the front of the troop, your feet are apt to sink into the material and therefore require more energy for controlling your balance. If you are further back in the troop, the surface is apt to be irregular and require more energy to plant your feet firmly. If there is sun, slippery ice patches further require effort to maintain your footing.

### The Basic Rest Step

For hiking up steep grades, like those you find in both the mountains and in canyon country, discipline yourself to take small, slow steps. Mountaineers have used this technique called the rest step for years, and it can be a very useful tool for you as well! How slow your step should be will depend on several different factors: the elevation you live at and that at which you're hiking, your aerobic fitness, how much weight you are carrying (both on your body and in your pack), and how steep the grade is.

The hardest thing about the rest step is disciplining yourself to go as slowly as you should. The step itself doesn't have to be anything more special than a SLOW step, somewhat like the wedding march! It might help you to think of some tune, or count numbers, or repeat a mantra in your mind to get your rhythm. A good test of whether you're doing the rest step correctly is if while you are hiking you can talk in a normal—not breathless—voice, you are doing it right! Remember that everybody's rest step will be different because of his or her different fitness level.

## The Lock Step

A similar mountaineering technique is called the "Lock Step." The Lock Step takes pressure and strain off muscles and transfers it instead to the bone structure. It is mainly useful on uphill slopes—especially on snow—where endurance is important. Guides on Mt. Rainier teach it.

After you take a step, straighten that leg and lock the knee. As you move to take the next step, place the weight of your entire body on the locked bone structure of your back leg. As you swing your leg forward to take the next step relax the muscles in that leg. Also, at the same time, stand more erect and relax your back and neck. You need to get into a steady rhythm of doing that for each step you take. You may feel like a robot walking slowly up the mountain, but you'll feel much better when you get there.

Continuous movement is a great strain on your muscles. Each lock step gives a fraction of a second of rest to your leg, hip, and back muscles as weight and stress is transferred to the locked bone structure of the rear leg. This is very effective for relieving pain in the lumbar and hip area as well as adding endurance to your legs.

## Practice

At first, it will seem very awkward and like it'll take forever to get anywhere, but you will be amazed at how quickly you actually get to your destination. Because you are not depleting your body's resources and building up lactic acid in your muscles, you don't have to stop near as often to rest. Therefore, you will save time in the long run. You will find yourself playing leapfrog with all of the fast hikers and not getting exhausted like they are. In fact, by doing this, you will still have energy to enjoy the rest of your day and not have to go straight to bed to rest! Try it—you truly will love it!!

[Excerpted from Hit the Trail and Lightweight Backpacker]

# Camping & Hiking Gear

## The Essentials

On every outing, each scout should carry a set of essentials as outlined in his scout handbook. While there are ten classic essentials, as is true for many troops we have adopted twelve.

See our website at  
[www.Troop486.net](http://www.Troop486.net)  
for our complete  
trail equipment  
checklist!

1. Pocket knife. Pocket knives are a really important part of scouting; they are the all-purpose tool for the outdoors. A knife can be a



scout's best friend or worst enemy. More accidents happen with a dull blade than with a sharp one. Each scout will learn how to safely use a knife, how to sharpen it, and how to care for it. There are official BSA pocket knives that are fine, but there are other brands. When buying a knife, do not buy the cheapest one you can find. It's really important that the steel be capable of holding a good sharp edge. Do not buy an overly large knife. Fixed blade, or sheathed, knives are prohibited in scouting; there is really no need for this type of knife.

Multi-tools are popular because they serve many functions, including pliers, scissors, can opener, screwdriver, and saw, but a single, good, sharp, lock-back blade is sufficient. Also consider the weight of the knife and whether the blades lock for safety.

**Avoid:** No fixed or sheath knives!

**Good:** Scout folding pocket knife

**Better:** Lock-back multi-tool (Victorinox Camper, Leatherman Wave, etc.)

2. Personal First Aid Kit. Each scout should carry his own first aid kit to treat scratches, blisters, and other minor injuries. The troop will carry its own first aid kit, usually with a comprehensive range of items, but this is not a substitute for each scout having his own. A group first aid kit will contain items that are potentially important, but not important enough to justify being carried by each individual.

Purchasing a complete first aid kit from a sporting goods store can be very expensive, and it may put too much emphasis on the wrong things. Sometimes the best part of a store-bought kit is the case it comes in. It's usually not only more thrifty but also more practical to put your own kit together. In fact, put lots of money into the contents of your own kit, and hope that you'll never need to use it.

The contents of a scout's kit should include everything that is detailed in the scout handbook for a personal first aid kit. Consider putting the contents of



your kit inside a ziplock freezer bag to make it waterproof. An adult's kit can include some additional items.

### Suggested Contents of Backpacking First Aid Kits

**Scout Version** (contents depend on both the maturity and experience of the scout)

- Aluminized mylar space blanket (bag-style)
- Antibacterial towelettes
- Antibiotic ointment
- Assorted self-adhesive bandages
- Biodegradable camp suds
- Fingernail clippers
- First aid section of BSA Handbook
- Garbage bag
- Insect repellent
- Medical information, consent forms
- Moleskin or molefoam, and scissors
- Non-rinse hand sanitizer
- Pen and paper
- Safety pin
- Sewing kit (needle, thread, & button)
- Spare AA or AAA batteries
- Sports tape or micropore tape
- Tweezers

**Adult Version** (includes everything in the scout version, plus the additional items below)

- 4x4 gauze pad & roller bandage
- Analgesic tablets
- Anti-constipation tablets
- Anti-diarrhea tablets
- Anti-inflammatory tablets
- Anti-itch cream or spray
- Anti-nausea tablets
- Benzalkonium chloride preps
- Eye cup and sterile wash
- Foot or body powder
- Gel blister pads
- Heat pack/cold pack
- Hydrogen peroxide
- Poison oak remover
- Prescribed medications
- SAM splint
- Sawyer extractor
- Sterile plastic gloves
- Tick pull
- Triangular bandage
- Vinyl gloves

3. Extra Clothing. Weather conditions in the outdoors can change and we must respond. On backpacking trips, extra clothing is important in case the scout gets wet or clothing is torn. This often can include an extra shirt or a warm outer layer like a fleece, bandana, windbreaker, or space blanket, and perhaps a spare pair of dry clean socks. This gear is other than what you plan to take and should be extremely compact and lightweight. In cold weather, 40% of body heat is vented from the head, so a knit wool or synthetic beanie cap or balaclava (hood) is recommended, as well as fleece mittens or gloves.



4. Rain Gear. While this might seem self-explanatory, every scout should be prepared for rain because it is not pleasant to be wet and cold. Emergency ponchos are inexpensive and lightweight, but they are not



breathable and only good for one time use. A more durable poncho is an absolute minimum you should have in your gear, and the military-style poncho with grommetted corners will allow it to double as a raintarp. A full rain suit is fitted to provide protection from the rain when it is coming from an angle and vented to allow evaporation of perspiration. It can also be layered with other clothing to provide extra warmth. Rainy weather can develop slowly on a hike; rain pants with fully zippered legs can be put on without removing boots or getting muddy on the trail, but most importantly rain gear should be used before you get wet. Other rain gear to consider is a backpack cover. Putting your sleeping bag in a trash bag first before putting it in its stuff sack will save your bag in really wet conditions or if you accidentally fall into a stream.



- Good:** Emergency poncho for one time use  
**Better:** Heavy duty poncho, with corner grommets, proper size  
**Best:** Lightweight breathable rain suit, jacket and pant (Gore-Tex, Frogg Toggs, etc.)

5. Water Bottle. Composed of 75% water itself, the body can last no more than a few days without water before it begins to shut down. It is a must to carry water with you at all times. Consumption of one quart or liter per day of water is a minimum, more in heat or exertion. It is



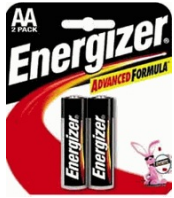
not advisable to carry a sports-type bottle with the pull-up top because these tend to leak and are difficult to refill. Each scout should have a good refillable water bottle, such as a wide-mouth 32-ounce polycarbonate Nalgene-type, which fit our water filters and are very useful for camp tasks. The lids on wide-mouthed bottles won't freeze as quickly. It is recommended that each scout also have a hydration system, because it allows you to drink while you are moving on the trail, so you stay better hydrated. For most backpackers, all that is needed is the bladder and the hose, not an entire backpack system. Scouts should not

put gatorade, electrolytes, or other flavored drinks into their hydration pack, as this becomes difficult to clean. Even if a scout has a hydration pack, they should still have a refillable water bottle as well.

- Avoid:** Glass, ceramic, canvas, leather, or metal containers  
**Good:** 16.9 ounce factory-sealed disposable bottled water (Desani, Arrowhead, etc.)  
**Better:** Widemouth 32 ounce plastic bottle  
**Best:** Lexan Nalgene bottle plus hydration pack (Camelback, Platypus, Dromedary, etc.)



6. Flashlight. Even for a day hike, a flashlight is important. If we are delayed getting back, or if we find a small cave, a flashlight will be helpful. There are several different types of flashlights. A key concern is weight. An aircraft aluminum maglite with four D cell batteries is not going to help a young scout. Any D cell flashlight will only be useful for base camping. Consider something with two AA or smaller batteries, and remember to pack a spare set of batteries and bulb. While more expensive, headlamps are popular for a reason—if you are pitching a tent, reading a map, or cooking a meal in darkness, a headlamp allows both hands free to handle your job. Other factors to consider include lumens (not watts), beam distance, run-time, size/weight, and water resistance. But you won't need your flashlight to walk after dark if you trust your night vision and available moonlight.



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- Avoid:** D cell type flashlight (only for base camping)  
**Good:** Small flashlight using 2 AA batteries  
**Better:** Hands-free headlamp (Black Diamond, Petzl, etc.), spare batteries, and bulb

7. Signal Mirror. Do you carry a reflective signaling device? Shouting, waving, and cell phones won't help in the back country. A simple hand mirror with a hole in its center is useful in signaling help using sunlight in an emergency. It's the best daytime visual signaling device you can carry. It's most easily used above the tree line, in open terrain, or from high vantage points. Amazingly, a flash can easily be seen from a distance of 10 miles and sometimes can be seen as far as 50 miles depending on atmospheric conditions. The record is 105 miles at sea. Even moonlight can be used, but with much reduced range. The technique involves reflecting sunlight off the mirror onto your hand or nearby surface to aim the flash. By slowly moving the bright spot to the target by turning and tilting the mirror, the mirror will flash where the bright spot is aimed, such as aircraft.



8. Trail Food. How much food will a scout need? It's surprising, but scouts will need less food than you might think, especially at higher elevations. Bringing along a few snacks, like one energy bar and one fruit snack per day, will be plenty on a long hike or if you start getting hungry before the next meal. The weight really adds up when you're going to be on the trail for a week. Trail food is anything other than what you plan to eat at a meal. Trail mix, or GORP (Good Ol' Raisins and Peanuts), is an old favorite. Please be aware that highly sweetened items like candy, chocolate, or gummie bears really do not qualify as food. Also, please do not pack extremely smelly items or things that need refrigeration or that will melt.



- Avoid:** Candy, chocolate, gummie bears, etc.  
**Good:** Trail mix: raisins, peanuts, granola, etc.

9. Matches and Firestarters. We avoid building open fires, but be prepared to build one in an emergency. Every scout should bring matches to each outing. Each scout will be taught under supervision how to properly use matches. It is not “safer” if you don’t have matches. If you can’t light your stove to cook, lantern to see, or make a fire for warmth, you will not be very comfortable. The wooden strike-anywhere matches are good. A butane lighter is equally useful. A firestarter is anything other than matches or a lighter, such as a ferrocerium rod, fatwood, or flint. Even hand sanitizer can serve as fuel. Ideally as part of wilderness survival training, a scout should be able to start a fire with more than one method.



**Good:** Ordinary kitchen matches in waterproof container  
**Better:** Wind and waterproof matches or butane lighter  
**Best:** Two redundant firestarting methods and tinder

10. Sun Protection. Waterproof sun screen with an SPF of 15 or more is recommended, even on overcast days, between 10 a.m. and 4 p.m. Glare can be greatest not only at midday but also in snow, near bodies of water, and on rock fields. Sunscreen should be applied half an hour before exposure begins in order to bind to the skin. But sun protection is not limited to sunscreen. No matter how effective the sunscreen, a wide-brimmed hat is important in hot, sunny conditions to minimize dehydration and exposure. Wear the largest, lightest wide-brimmed hat you can stomach. It will keep you cooler and lessens the chance of skin cancers later. A scout should also have a hat that covers his ears (baseball caps do not qualify). Eye protection includes sunglasses with UV protective coating. Lip balm, like chapstick with an SPF, is helpful as well, but select the unflavored, unscented type.



**Good:** Hat that covers ears, sunscreen  
**Better:** Wide-brimmed hat, UV sunglasses, 15+ SPF sunscreen & lip balm

11. Map and Compass. Topographical maps are usually issued at the beginning of each hike. Every scout should have a compass, and practicing with them is fun. We use them on every hike, every camping trip. While there are many types of compasses available, the one that best suits the needs of a scout is a base-plate, or orienting, compass. This type of compass allows a scout to orient maps and take bearings easily. Other types of compasses, especially those without a baseplate, are typically more frustrating for a scout. Any compass should have its needle fluid-damped, as this prevents the needle from bouncing and drifting while in use. Some compasses have an adjustment for declination, to compensate for the difference between magnetic north and true north. A more complex “sighting compass” with a mirror is not needed. No scout needs a GPS.



- Good:** Compass
- Better:** Compass with base-plate
- Best:** Fluid-damped compass with transparent baseplate, declination adjustment, and lanyard, with 2-degree increments (Silva, Brunton, Suunto, etc.)

12. Plastic Whistle on Lanyard. If you get lost, you can shout loudly for about five or ten minutes—until you become hoarse and unable to shout at all. A loud whistle will allow you to be heard farther, louder, and longer. The best kind truly is plastic: it won't sink in a lake like metal will. Also, the best kind has no "bead" inside, because if the bead gets wet or frozen, the whistle may not work until it dries or warms. Lastly, on an outing your whistle should be attached to you on a lanyard or D-ring someplace where you can easily and quickly reach it. There is no value in having to search through your gear to find your whistle in an emergency where time is of the essence. In the U.S., three blasts on a whistle is a distress signal and two blasts is the answer. In fact, three of anything, a light, a sound, a fire, a flare, is a distress signal.



- Good:** Any whistle
- Better:** Bead-less plastic whistle on lanyard (Fox40, Storm, etc.)

13. Toilet Paper. Toilet paper is always a good idea—in the trunk of the car, in your daypack, in your backpack. What would you do if you need it and are without it? Start with a less-than-full roll, remove the inner cardboard tube, and it will flatten to save space and weight. Store it in a plastic ziplock bag that will keep it clean and dry. Carry extra ziplock bags to carry out the waste paper.



## Clothing

On some scout outings, such as troop meetings, camporee, parades, and Court of Honor, the field uniform, or "Class A" uniform, must be worn. However, on most day hikes and backpacking trips, scouts should be comfortable and will be getting dirty. We wear clothing that is better suited for these activities.



Believe it or not, something as simple as clothing is an important part of managing the overall safety, as well as comfort, of the troop. While cotton is a very comfortable fabric, it can literally be a dangerous one in the backcountry. Cotton absorbs water efficiently and dries slowly, which robs it of its thermal insulating properties so that it radiates warmth away from the body. It is also an effective breeding ground for bacteria, which makes it smell bad after just a day or two on the trail. Despite its durability, denim is not a useful fabric on the trail because it is very heavy. It chafes badly. Once blue jeans get wet, they take forever to dry and chill you down in the meantime. Various types of synthetics work much better

on the trail, including polyester, polypropylene, and various trademarked fabrics. Merino wool, the other useful fabric, is a no-itch, no-shrink natural fiber used in many outdoor articles of clothing. Thin layers work much better than bringing a single, bulky coat. They trap air between the layers and are insulating.



Each piece of clothing should work cooperatively with each other piece of clothing as a versatile system. Ideally you should be able to wear all the clothing you carry in layers at the same time comfortably. Thermal

underwear, a long sleeved poly shirt, a synthetic microfleece pullover, and a nylon or gortex shell or windbreaker will flexibly accommodate changing weather conditions and may weigh less. The inner layer serves to wick away moisture and transport it into the air. The midlayers are warming layers. The outer layer is to protect from wind, rain, & snow. A ripstop gortex or activent fabric repels moisture coming from the outside, but breathes inner moisture out.



Long pants are very important in avoiding cuts and scrapes on the trail, but in warmer weather, hiking is best done in convertible pants that have zippers at the knee to remove the lower half to become hiking shorts. This design allows scouts to adjust to changing conditions. On backpacking trips it is advisable to bring two full sets of clothing—shirt, pants, underwear, socks—one set to wear and one to wash.

- Avoid:** No blue jeans or cotton cargo pants!  
**Good:** “Class B” T-shirt, nylon cargo pants  
**Better:** “WWW” system of Wicking-Warming-Windproofing layers, including poly thermals, nylon shirt/convertible pants, fleece outer, and gortex shell

## Footwear

Sore feet or blisters on the trail can ruin an otherwise great trip. All footwear must fit well to protect your feet and provide help in supporting your backpack. Casual shoes or sandals are not appropriate on hiking or backpacking trips. There are two main schools of thought about good footwear for hiking and backpacking: leather boots versus trail shoes. Hiking boots with a high top and lug soles provide ankle support and protection for multi-day backpacking. Trail shoes or trail-running shoes are lighter for day hikes with a day pack. A vibram sole is recommended because it is replaceable.



There are many types of boots, but for young scouts on a weekend backpacking trip, it is best not to spend hundreds of dollars. Many discount stores stock inexpensive hiking boots. They don't last forever, but for a scout that is growing, they will do fine for a year or two of weekend

outings. One pound on your feet is like five to nine pounds on your back. A versatile, mid-weight leather hiking boot runs 3 to 4 pounds per pair and is good for most conditions. The pounding of a 50-miler might entail a better boot for an older scout. Steel shanks are not necessary unless you are carrying 60 pounds and going through the scree cross-country.

When someone asks what's the best boot, the answer depends on two factors: the one that meets your usage requirements, and the one that fits comfortably. Try on boots with the sock combination you actually will use on the trail. Look for a snug fit, especially around the heel where slop will cause major blisters. Toes should not jam against the inside of the shoe. Try on as many boots as possible. Wear them around the store. An experienced salesperson will be helpful.

In any event, make sure that boots are broken in before a trip. This means wear them around the house, go on some short neighborhood walks, then day hikes to allow them to soften and shape themselves to your foot.



One of a hiker's most important clothing items, well-fitting hiking socks are essential to keeping feet clean, dry, and free of blisters. In fact, wearing two pairs of socks is the best system, with a light synthetic wicking liner to protect against blisters beneath a thicker, padded wool or synthetic outer

layer for cushioning. Bring an extra pair of socks, one to wear if the others are wet from a stream or drying out after washing. A separate pair of cozy socks just for sleeping in are great as well.

A pair of extra laces are good to bring along. They are small, lightweight, but will be really important if a lace inadvertently breaks while on the trail. A nice feature is an extra pair of lightweight shoes or sandals to wear around camp to let your boots air dry and let your feet relax or to wear when wading creeks. Scouts should trim their toenails before a hike or backpacking trip that involves distance or steep climbs; long toenails inside a boot can cause bad injuries to the toes.

**Good: Sneakers**  
**Better: Low-cut hiking shoes**  
**Best: Hiking boots, solid leather upper, lug soles**

**Avoid: Do not wear cotton socks!**  
**Good: Single layer wool**  
**Better: Double layer—thin wicking poly liner and thicker “smart wool” outer**

## Lumbar Packs

Also called “waist packs” or “fanny packs,” lumbar packs are tucked into the small of your back and are the most efficient at carrying very small loads. These are compact, convenient, easily stuffed into larger hiking backpacks or in your suitcase for airline travel. The main drawbacks are the more the weight, the more they tend to sag—and annoyingly bounce with each step. Ten pounds is about the maximum load, but that is enough for day hiking, though some models claim to carry up to 20 pounds (approx. 1200 cu. in). Good models have dual water bottle pockets, padded belt and lumbar support, and allow you to compress your baggage and eliminate the sagging for most day hiking loads.



## Day Packs

Daypacks are ideal for carrying light loads over short distances. They are usually a small one-to-three pocket pack suitable for carrying just essentials, water, and lunch. General purpose daypack capacity range is from 500 to 2,500 cubic inches. In daypacks of 3,000 cubic inches or more—for a long day of hiking—look for models with a framesheet and at least one internal stay. Even an inexpensive book bag is sufficient for a day hike. A padded hip belt and padded contoured shoulder straps are also good to maximize comfort. We may use a daypack in conjunction with a backpack as a way to leave behind most of our gear while conducting a side trip. A very light day pack can also double as a bear bag.



## Backpacks

The most obvious piece of equipment for a backpacker is a backpack. There are two main categories of backpacks, external frame and internal frame. External-frame hiking backpacks were the norm in years past. Now internal-frame packs are the most popular.

External frame backpacks feature a “ladder” type frame with a pack bag and pockets attached to it. External frame packs have been the standard for many years. Externals put the majority of the load directly on the hips, keeping the weight off the shoulders, so it’s very important that the hip belt be correctly fitted. Often young boys have very narrow hips and the belt won’t pull tight enough, so be sure the belt fits. It can make all the difference on a long hike.



Some advantages of an external frame include being cooler to carry because the load is not sitting directly against your back and allows greater airflow between your back and the pack itself. Weight distribution can be better; the pack won’t sag like an internal pack might. Your center of gravity is higher, which allows you to walk in a more upright position. Organization is easier;

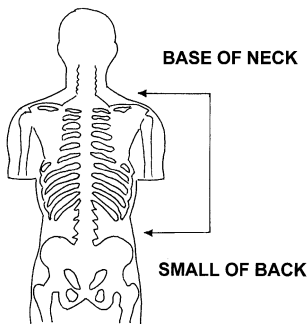
with five or more outer pockets and separate compartments, an external is easier to organize. As a result it is often easier to reach items. Water in one, clothes in another. It's also much easier to strap on a sleeping bag, tent, and pad. External frame backpacks are almost always less expensive than an internal frame of the same carrying capacity.

Internal frame backpacks have become increasingly popular in recent years. Internal frame backpacks feature an external bag inside of which a support structure is constructed. Some advantages of an internal frame are that they tend to possess a longer, narrower profile that allows more maneuverability in tight places. You can move your arms and the pack stays put during jumps and other tricky maneuvers. The supporting stays are often adjustable, so you can achieve a fit that is snug and closer to your center of gravity so it is better for balance.



Internals will have a series of compression straps that cinch the load down tight, avoiding the shifting of the load that can otherwise throw you off balance. Climbers and those who go off-trail enjoy internals for these reasons. Internals have a series of straps which allow for a highly customizable fit, a feature that can allow for a scout's physical growth over time during the teenage years. With just one pocket, internals can be more difficult to stay organized. Everything ends up coming out of the bag each time you need something; however, some internals have a separate bottom compartment for your sleeping bag.

The total amount of weight you carry will determine the volume of your backpack. The capacity of a backpack is measured in either liters or cubic inches. The size you need depends on what you'll be doing and the amount and type of gear you want to carry. Avoid using a pack that is too big. Most people tend to fill available space, which makes for a heavier than necessary load to haul. For three-season weekend trips (two or three days), look for a pack in the 3,000 to 4,500 cubic inch range. Most of our trips are of this type. Larger sizes are for longer or more challenging trips that will involve proportionally more food or more layers of clothing. Once a year, the older scouts will go on a week-long trip or more that may require more volume: 5,500 to 7,000 cubic inches. For this occasional trip, renting a larger pack may be appropriate.



Fitting a backpack is very important. Do not send your scout on a trip with an unfitted backpack. A well-fitted, heavier backpack may be more comfortable than a lighter pack that is ill-fitting. If a pack is too long, the hip belt won't hold the load correctly. If a pack is too short, it can be very uncomfortable. Backpacks are measured by torso length. With a friend, use a flexible tape measure and measure from the lump at the base of your neck down your spine. Find the two bumps on the front of your hips by putting your hands on your hips. Drawing an imaginary line horizontally between your thumbs; that line is where you stop measuring. Your measurement will fall into one of three basic



categories. “Small” is up to 17½ inches, “medium” is 17½ inches to 19½ inches, and “large” is 20 inches or longer in vertical torso length. A good retailer will be happy to measure you and fit you to the right backpack. It is important to note that some backpacks have a greater vertical range of adjustment to accommodate a boy’s growth over time. For younger or smaller scouts a women’s sized pack may provide a better fit than a men’s pack.

It’s always best to try on a pack before buying. Don’t be afraid to ask the salesperson to help you adjust the pack so that it fits you well. The hipbelt should truly fit over your hips and not around your waist. Be sure to put some weight in it and walk around the store. Many stores have sandbags that you can put into the packs. A completely empty pack will fit and feel very different from one that’s loaded down with 25 or 30 pounds of gear. Bend over and touch your toes. Sway from side to side. Jump up and down. The pack should stick to you like glue and not throw you off balance. Take the pack off, loosen all the straps, put the pack back on, and tighten all the straps. A good store will let you return it upon further experimenting at home with your own gear.

**Good:** Borrow from troop, rent from sporting goods store  
**Better:** External or internal frame pack, with capacity for a three-day weekend  
 (REI, Northface, Osprey, Gregory, Arc’Teryx, Marmot, etc.)

## Straps & Covers

Using a rope or cord to tie a sleeping bag or pad onto a backpack won’t work well. It will always get loosened, with the gear either swinging back and forth or just falling off onto the ground or down a slope.

Bungee cords can work, although they tend to be a little heavy, and there is always some risk of getting hurt if a cord isn’t attached correctly and comes flying at you. The best approach is a pair of nylon straps with clips that snap together or velcro surfaces. Some packs have built-in straps, others do not. When strapping a sleeping bag or pad onto your pack, run it’s stuff sack loop around the strap so it is doubly secured even if it slips through.



There are several ways to cover a backpack. One of the simplest is a large garbage bag. This can be helpful when there is a lot of dew in the morning or a light rain. They don’t work very well when you’re hiking, however, so a real pack cover may be a wise investment. Make sure the pack cover fits your pack, otherwise it may slip off and be lost on the trail.

## Sleeping Bags & Pads

Probably your first purchase will be a sleeping bag. The proper sleeping bag can make the difference between an enjoyable outing and a miserable one. You should get a sleeping bag that is intended specifically for backpacking and that will keep you warm under the most extreme conditions we might face.

A sleeping bag works by trapping and holding air next to your body. Your own body heat warms up this air and keeps you warm. The bag's ability to maintain this heat, combined with how light it weighs, will determine how much it costs. The lighter and warmer the bag, the more expensive. When you are looking for a sleeping bag, consider several key points: comfort rating, type of fill, and bag shape.

The comfort rating of a bag is the lowest weather temperature the manufacturer says the bag will effectively operate. This is not an exact number, many things will influence how a bag performs. Use these numbers as a guide, but check with other sources to determine how accurate a bag's rating is. Buying a bag slightly warmer than you think you'll need is a good idea. In warmer weather, you can always unzip it a bit for ventilation. Scouts in our troop should have a bag that is rated at least to 20+ degrees Fahrenheit or colder.

There are two main types of filling in a sleeping bag—down or synthetic. Down is the very small feathers next to the body of certain types of birds. Goose down is the very best. Down is very light, compresses well, very durable, and keeps you very warm by weight. It is also very expensive. Down will also not keep you warm if it gets wet. Synthetic fills, trademarked by various names, are usually less expensive, and they can keep you warm even if they get wet. If you cannot be certain that you can safeguard down from moisture, then opt for synthetic. Synthetic is usually better for scouts because of better durability, better thermal properties when wet, and lower expense.



Two main bag shapes are available—rectangular or mummy. Always consider a mummy shape for camping with scouts. Mummy style is warmer because there is less open air space in a mummy bag for you to have to keep warmed up. A mummy bag is lighter and stuffs into a smaller space than a rectangular bag because it has less material. It usually has a hood to cover your head.

Features to look for in a sleeping bag include a draft collar which cinches around the neck, ease of ventilation with a full side zipper for warmer weather, a double side zipper (that you can reach either inside or outside the bag), and a velcro or snap closure over the zipper to prevent the zipper from sliding down, a baffle behind the zipper to keep out cold better, and 700-800 fill-power which lasts longer than lower-rated fill. Some bags have a pocket sewn into the hood for inserting a rolled-up fleece to create a pillow. A separate sleeping bag liner, made of silk or synthetic will add an added layer of warmth and comfort, enhancing insulating power by up to perhaps 10 degrees and is better than an external bivvy sack that otherwise creates condensation.





A ground cloth will be necessary any time we camp and use sleeping bags on the ground without tents. These are essential for keeping away moisture. While a plastic tarp will do, the better alternative is an aluminized emergency blanket, found in most sporting goods stores.

In cold weather a bag is almost useless without a thermal ground pad, because the sleeping bag will compress against the ground, giving almost no insulation to retain body heat; the ground beneath will suck the body heat right out of the scout. There are several types of pads. The simplest and least expensive type is a closed cell foam pad. These provide fine protection against the cold, hard ground. More expensive types exist, including the rigid z-fold foam pad and a self-inflating, open-cell pad. These can be very comfortable and provide good insulation but can be heavier. Inflating mattresses can be very comfortable, but are relatively expensive and bulky. For younger scouts, a closed cell pad is best.

**Good:** Cloth square bag  
**Better:** Mummy synthetic-fill bag, rated to 20 degrees Fahrenheit  
**Best:** Mummy down-fill bag rated to 20 degrees Fahrenheit (REI, Big Agnes, North Face, Mountain Hardware, etc.)

**Good:** Plastic tarp  
**Better:** Aluminized emergency blanket

**Good:** Inflatable mattress or folding cot (only for base camping)  
**Better:** Closed cell foam pad (Insulite, etc.)  
**Best:** Open cell, self-inflating pad (Thermarest, etc.)

## Shelter

Scouts do not have to provide their own tent. Our older scouts tend not to use tents under most conditions. They will carry tents that are used by the younger scouts. Tents are really only needed under one of three conditions: rain, wind, or insects. Moisture is a significant threat to physical safety because it produces chilling and increases the risk of hypothermia. Wind isn't dangerous but a night of blowing will keep most people awake, and being well-rested is important when we are required to physically exert ourselves on a trip. Insects similarly are at best a nuisance, and some insects that carry diseases are a hazard. Tents will be issued by the troop quartermaster to patrols. Parents can bring their own tents.



Tents fall into several main designs: dome, hoop/tunnel, or teepee. Dome tents maximize living space with ample headroom. These are good in moderate weather conditions. Hoop/tunnel tents are very lightweight, typically tapering downward from the head to the foot. They usually require staking to maintain structural integrity. The teepee is a waterproofed tarp draped over a center pole and staked out, but doesn't fend off bugs well. Tents can have a single-wall or double-wall

construction. The most convenient tents are free-standing--they do not rely on tent stakes to stay up.

Features to look for in a tent include a tub floor that adds significant waterproofing protection by lifting floor seams away from the ground. Tents have hundreds of needle holes along the seams that can let in water; factory seam-sealing helps prevent this leakage. A vestibule is an entry area that provides space for gear and shelter over the door. Headroom is important to be able to sit up. Ease of set up, take down, entry, and exit are important. Test them out for yourself in the store. Will you get caught in a summer storm in the mountains? Ventilation capability is critical. Single-wall tents should have vents for air flow. Double-wall tents should have mesh windows and doors to allow for good air circulation between the tent and the rainfly.



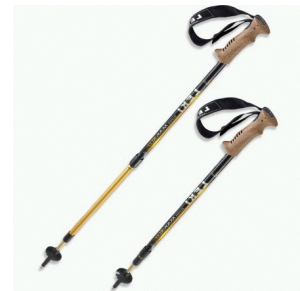
If your tent does not come with a footprint—a plastic sheet to set between the tent floor and the ground—then make one by cutting a sheet of 4 mil plastic to match a shape just slightly smaller than the tent’s floor.

The main contributors to the cost of a tent are (1) breathability of the fabric, and (2) strength of the poles and stitching.

**Good:** Borrow from troop, rent from sporting goods store  
**Better:** For adult participants, solo or 2-3 person, 3-season backpacking tent (REI, Kelty, MSR, Marmot, Mountain Hardware, North Face, etc.)

## Hiking Sticks & Trekking Poles

This best-kept secret, trekking poles give an advantage which most people don’t understand until they try them. Used for some time in Europe, trekking poles (also known as hiking poles, hiking sticks or walking poles) are becoming a common hiking accessory here in the United States.



When in use, they resemble ski poles, with baskets at the bottom, rubber-padded handles, and wrist straps. Unlike ski poles, however, they are often made in two or three sections and can be extended and retracted as necessary for use. Their maximum length is usually 135 cm (54 inches). Some poles come with spring-loaded tips to aid walking under normal conditions and to reduce wrist strain. Trekking poles are usually made from lightweight aluminum or

carbon fiber. When fully retracted, they can sometimes be stored in the side pocket of a backpack.

Descendants of the common walking stick, trekking poles are usually used by hikers for the same reasons—stability in bouldering, probing depth of mud or water, facilitating stream crossings, lateral stability on rough terrain, balance on steep grades, support for knee pain. In environments where snakes are prevalent, a hiking stick or trekking pole can be a smart tool.



Poles provide some rhythm to a walking pace. They lift the arms and therefore reduce the swelling that can occur in your hands and fingers. It is estimated that trekking poles can add up to 20% efficiency

to the body by transferring some of the load to your arms, greatly reducing the need for leg muscles to continually provide balance. Lighter shoes can be used as a result.

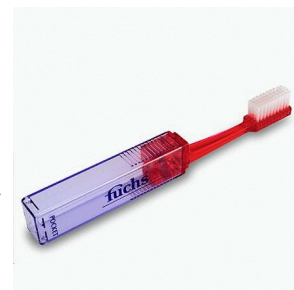
See our website at [www.Troop486.net](http://www.Troop486.net) for a good article on trekking poles!

Some very light backpacking tents and bivouac shelters are designed to use trekking poles as tent poles. Fingerless gloves can be helpful to avoid the friction associated with the grip on trekking poles. A single walking stick is better than nothing but is more awkward than two lightweight trekking poles.

**Good:** Hiking stick  
**Better:** Trekking poles, pair  
**Best:** Telescoping, shock-absorbing trekking poles (such as Leki, Black Diamond, etc.), gloves

## Toiletries

In the backcountry, few toiletries are needed. A toothbrush with a bristle cover is important. Toothpaste is not essential because 90% of the value of brushing is completed by the brush itself, not the paste. Toothpaste is a smellable and needs to be put in a bear bag at night. It also leaves a mess when the scout spits it out.



Soap is useful, but mostly for washing dishes. A small bottle of biodegradable campsuds is good but should be used sparingly and far away from water sources like lakes or streams. Even if it is biodegradable, we must never foul natural water sources.

A small microfiber hand towel can be useful; even a regular bath towel is much too big. Deodorant is not needed. Baby powder is excellent for most of the uses deodorant serves. Baby

powder helps rid odors but also manages chafing and foot problems. Unscented toiletries are best so they will not be mistaken for food by animals.

## **Waterproofing**

Hardly an enemy to a backpacker, rain or snow adds skill challenges that only require some thought and preparation to prevent moisture from spoiling a trip. But it is important to realize that dryness is very important to overall comfort, health, and safety.

No backpack is ever waterproof. Backpacks are best protected from rain by use of a pack cover. Cover it to protect it from dew that collects during the night. Even a 30-gallon garbage bag over your bag will keep it dry. Some ponchos are sized expressly to cover person and backpack together. Another option is to put a large heavy-duty garbage sack into your pack bag as a liner to ensure everything is protected (this is probably the lightest approach for keeping gear dry but doesn't provide for good gear organization).

Organize gear inside your pack in waterproof stuff sacks or heavy duty zip-loc freezer bags. If your trip crossing a stream with your pack on, just a few inches deep may be sufficient to submerge your pack and soak your clothes, food, sleeping bag, and tent.

One of the nicest feelings after a long hike is breaking out a fresh pair of clean, dry socks. Even in relatively dry weather, humidity and dampness can spoil this, so store your socks in ziplock bags.

Use of goretex, a breathable fabric, plus a gusseted tongue, will improve the waterproof properties of a boot for stream crossings and snow. The fewer seams the better. Then waterproof them. Several brands of waterproofing include seamgrip, sno-seal, or nikwax. An old toothbrush and a hair drier will help get the sealing agent down into the seams.



Sleeping bags are best protected from rain when they are strapped to a backpack by being wrapped in a garbage bag before being put into its stuff sack. You can encase a sleeping bag in a bivy sack for greater waterproofing. Clothing is best protected from rain by making sure that fabrics are synthetic so they will wick moisture, as well as by packing a poncho or a rain suit. Boots should be either waterproof with sealed seams and a gusseted tongue, or sealed with a chemical preparation available at most outdoor retailers.

Tents are protected from rain in several ways. Good tents are sealed at their seams and electronically tested for leaks. Tent seals can also be sealed with a liquid seam sealer available at many outdoor retailers. A tent should be pitched on top of a "footprint," which is a plastic sheet that is cut to match the shape of the floor of the tent. Footprints should not exceed the

dimensions of the tent, otherwise they will channel rain water under the tent. Tents should be equipt with a rainfly, or protective outer shell that drains rain off the tent itself.

## **Wet Weather**

Interesting weather does not cancel scout outings. If you spend any amount of time in the backcountry at all, it will rain on you. Attitude is everything: it's only water. Rain is a good thing because without it there wouldn't be much backcountry to enjoy, and it adds to the adventure! How you prepare for rain and how you handle yourself and your gear in the rain makes the difference between a great experience and a horrible one.



Always check the weather forecast before you go. If the forecast calls for a 20% chance of rain, you will probably plan differently than you might for an 80% chance of rain.

Staying dry is nonetheless important. Treat your tent, hat, jacket and pack with waterproofing—even if they're labeled “waterproof” to begin with. Ponchos or rainsuits are essential for more severe rain, but take a few extra garbage bags to cover things as well. Pack a brimmed waterproof hat and jacket. A large tarp with grommets and a rope can cover your cooking area if the rain is sustained. You will appreciate having a spare pair of shoes and socks if your first pair get wet, which more than likely. Bring a sponge to mop up water because spills will happen.

Food and other supplies need to be kept dry, too. Store everything you take in re-sealable plastic bags, especially socks, matches, maps, toilet paper, and your first aid kit. Pack your sleeping bag in a large plastic trash bag before putting it into its stuff sack, or use a specially designed “dry bag.”

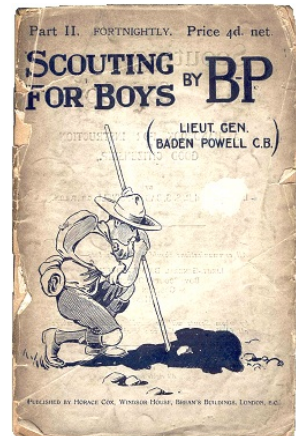
There's nothing better than sleeping in a tent when the rain falls. But to enjoy the rain, it is important to stay dry, so never pitch your tent in a low lying area or against a slope. Avoid ravines, basins, run-offs, washes that may channel a flash flood. Look for a durable surface which will allow water to run off more effectively. Look for a campsite this is somewhat protected from wind, flooding and heavy rain fall. Under a group of small trees is ideal but keep away from the tallest tree in the forest—that's where lightning likes to visit. We do not dig trenches around our tents because this leaves an unnecessary impact on the land.

Under your tent, place a tarp or “footprint” that is just slightly smaller than the size of your tent to avoid channeling runoff under your tent. Place a mat or plastic bag in front of your tent door to collect debris. Keep an eye on your tent after you've set it up. Examine the tent's rain fly and the ropes/stakes holding your tent in place to make sure that drizzle doesn't find a way inside your tent. Once inside your tent, keep all of your gear away from the camp walls as they tend to

get wet on the inside from respiration by morning. Even so, bring a bailing sponge to soak up any puddles that may accumulate inside your tent.

Body heat is a precious commodity. Conserve and protect your body by staying dry on the outside and wet on the inside. Keep your feet dry by carrying extra socks in ziplock bags. Drinking water remains important when body heat is being lost. Remember, hypothermia does not require extreme cold to occur. But avoid drawing water from contaminated run-off.

If the weather rolls in and you are restricted to settling into your tent for awhile, entertainment is likely to be a consideration. Bring light-weight “rainy day” games, a deck of cards, checkers, or a book with you. This modern world rarely gives us time to do absolutely nothing. Embrace a rainy day and enjoy it for all it's worth.



## Hot Weather

Hiking and backpacking in the arid Mediterranean climate of Southern California can be exciting and challenging. Temperatures at times can range into the triple digits. Our standard gear is well-suited for most seasons and conditions, and hot weather gear can be lighter, but hot weather means paying special attention to how that gear should be used.



In hot weather, you can lose about four liters of fluid each day in three main ways—breathing, sweating, and urinating. Each contributes to fluid loss in differing amounts depending on your activity level, environment, and health. But, hotter and drier air along with strenuous physical exertion can push that up to one liter per hour, so stay well-hydrated. Drink lots of water. Include an electrolyte in your fluid intake. Mix it about half strength in your water to replenish what you sweat out. The best

electrolyte drinks are “isotonic”—that is they have neither more nor less salts than the body and are therefore rapidly absorbed, as much as three times faster than other fluids. Include some salty snacks for the trail. Drink at intervals of every 10 or 15 minutes, before you experience thirst, more often as the temperature climbs. Thirst is an early sign of dehydration.

Water weighs about eight pounds per gallon. In desert conditions, be prepared to carry all your water with you. Don't plan on finding any

See our website at  
[www.Troop486.net](http://www.Troop486.net)  
for some great  
YouTube videos  
about hydration  
systems.



water on your hike—even a spring marked on your map has a good chance of being dried up when you get there. However, if you do come to a water source, drink there at the source, then refill before leaving.

A consistent, non-exhaustive hiking pace will help with avoiding dehydration. If there is a stream on your route, wade in to cool off. Use a soaked bandanna to cool your head and cover your neck as you hike, too. Take more frequent rest breaks.

Wear clothes made of light fabric and light colors to effectively reflect and shade you from the sun. As odd as it may sound, wear polyester instead of cotton to better wick sweat away quickly. As odd as it may sound, in desert conditions, wear long-sleeved shirts and convertible pants; brushing your calf against a cactus while wearing short pants can easily take an hour out of your hike and possibly ruin the whole thing. Also, make sure the clothes you are wearing are loose-fitting for more air flow and less chafing. Take a wide-brimmed hat and sunglasses.



The sun can fry you and long before you feel it. Apply sunscreen liberally an hour before you head out and occasionally reapply it if you're sweating or wiping it off. The heat and extra sweating may help you experience your first blister in a long time, so notice and treat hot spots early. Don't forget your moleskin. Sunglasses can be important to prevent eye strain. Heat, humidity, and the season may predict high numbers of some insects. If you anticipate a swarm on the trail, take your repellent and a headnet.

Arid regions have more venomous and poisonous critters than cooler areas. Snakes and reptiles are in the sun to warm up when it's cool and in the shade to stay cool when it's hot. Never put your hand where you can not see, like in a hole or under a rock. Always check around the area before you rest or sit down. Up-end your boots before putting them on. Keep your ears open for a rattlesnake's warning.

## **Cold Weather**

The best way to keep warm in cold weather is to dress in layers that keep weight low while keeping insulation and adjustability high.

For the upper body, an external jacket or shell is important. A synthetic or wool fleece pullover, sweatshirt, or sweater is important. A long sleeved synthetic underwear shirt is essential. Gloves and a wool or synthetic hat that covers the ears is standard. Consider a balaclava, or hood.



For the lower body, a pair of polyester or nylon zip-off or sweat pants are important. Long synthetic underwear bottoms are similarly essential. Jeans are strongly discouraged because of

their heightened ability to absorb water and perspiration. Double-layer socks are best—an inner thin silk or synthetic layer and an outer thick synthetic or wool layer.

When its cold, loops of nylon cord tied to zippers will give you a better grip when wearing gloves or mittens. Take water containers into your sleeping bag to prevent freezing during the night. And plenty of snack foods are important in cold weather. Consider sleeping with your hat or balaclava on. In cold weather your essentials should always include extra clothing and a mylar bivvy.



## **Snow**

In addition to the essentials for cold weather, special considerations must be taken for snow. Clothing made of synthetics or wool are strongly recommended and cotton fabrics are discouraged because the risk of hypothermia is greater in cold, wet conditions and the need for non-absorbent, quick-drying clothing is all the more important to mitigate the negative effects of evaporative cooling that can bring on hypothermia.

Bring one set of clothes for snow play and another dry set for evening and sleeping. Pants designed for snow are important. While waterproof snow boots are important, waterproof hiking boots are not as good because they don't retain as much warmth. A backup pair of mittens or gloves is good because these easily become wet and cold. Sun glasses or ski goggles are recommended, especially if the day is bright.

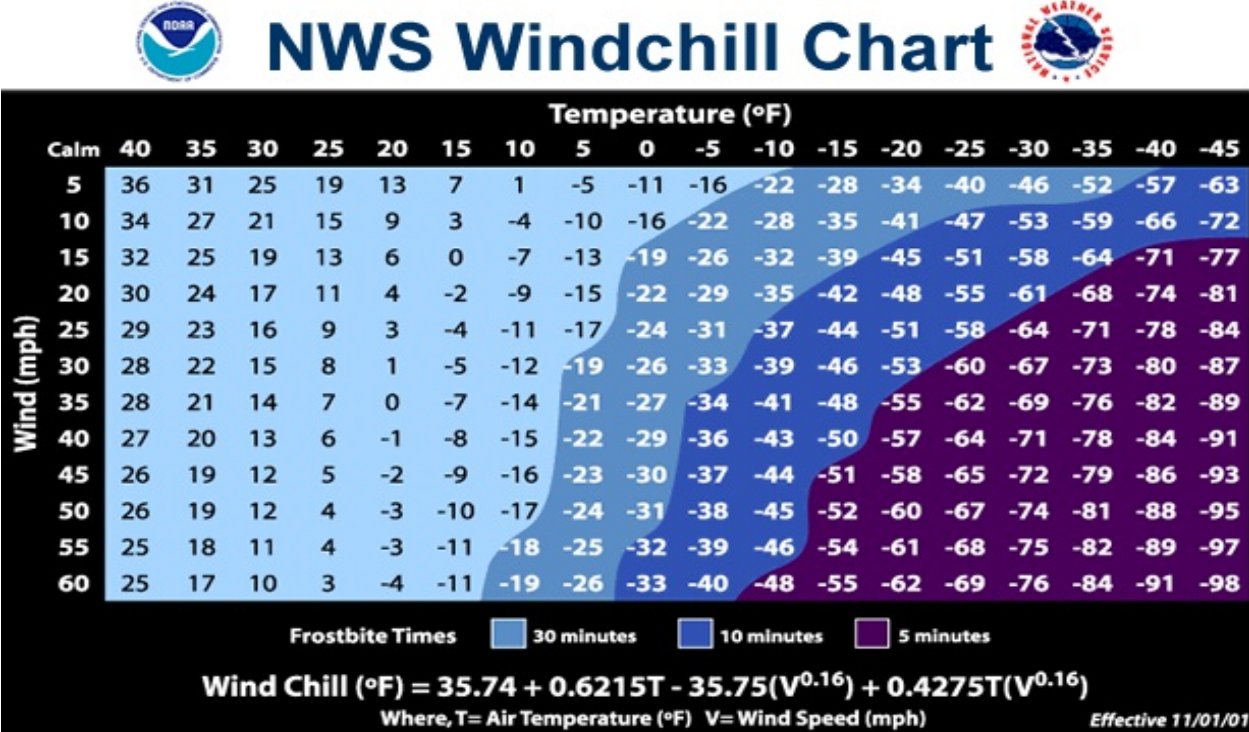
For sleeping, unlike most trips, a double layer of sleeping pad material is recommended for increased insulation when sleeping directly on snow. A sleeping bag should be rated for sub-freezing temperatures in order to be comfortable.

Drivers must consider the need for tire chains, a windshield ice scraper, and shovel.

See our website at  
[www.Troop486.net](http://www.Troop486.net)  
for our Snow  
Camping Essentials  
checklist!

## **Wind**

High winds require special attention. Because wind chill more rapidly draws away body heat, protective clothing is needed, such as nylon shell jackets. A breeze of only 15 miles per hour can take a 40 degree night down to freezing air temperatures. Like rain, wind is a condition under which tents can be important for getting a sound sleep, but location behind natural windbreaks and anchoring of tents needs particular attention. Avoid campsites under powerlines. Fire safety is particularly important in dry, windy conditions that may worsen conditions in fire-prone vegetation-covered areas.



### Cycling

Occasionally, we may include in our schedule a “bike hike,” which may combine cycling with hiking or camping. Before the outing, conduct a check to be sure that your bike is fully ready for the trip. It should be properly sized to the rider. Geared bikes are strongly recommended for even the mildest of slopes we may encounter. Bikes should be in good repair: check tires, tubes, stems, rims, brake pads, cables, gears, and the chain.

Bring a day pack equipped with your essentials. A certified helmet is required by law for youth but is also strongly recommended for all adults. Padded fingerless cycling gloves can make the trip more pleasant. A set of tire change tools, a spare inner tube, and a tire pump are highly recommended. Make sure your pump has the correct valve fitting (Schrader or Presta) for your bike. Some pumps can accommodate either type of valve.



Adhere to all rules of the road where traffic is present. On the path the usual etiquette applies, so please yield to hikers, runners, fishermen, horses, and pets. Our bike hikes are not races; so speed and competition are not encouraged.

## Fishing

The fishing merit badge can be addressed on some of our outings that reach stocked waters. Be forewarned: if fishing is allowed at all, a valid California fishing license is required for individuals aged 16 and over. Usually the gear we will take is minimalist, such as a reel and tackle, perhaps a telescoping rod. In catch-and-release areas, you can disarm a barbed hook by crimping down the barb with a pair of pliers. In bear country, be especially aware of handling potent fish smells that result from cleaning and cooking fish.



## Beyond the Ten Essentials

In addition to the ten essentials, there are a variety of checklists for gear that would be considered helpful in survival conditions. What you carry depends entirely upon your risk tolerance, but in principle, "If you didn't bring it, you don't have it."

A wristwatch is a useful all-around tool. Some recommend that your multi-tool have a saw blade. Two redundant fire-starting methods may be valuable, such as a lighter and a ferrocerium rod. 50 feet of thin nylon cord, carabiners, a bundle of 8" cable ties, and duct tape, with plastic garbage bags are sufficient to erect a very light storm shelter. Fish hooks, leader and sinkers can be used to catch fish or snare small land animals for food in an emergency. Picture frame wire can be used to fashion snares. As part of your survival kit, it might be wise to have some way to purify water, such as iodine purification tablets. A candle is just plain handy to have. A folding pack shovel is useful but adds additional weight. Lastly, some money can be helpful to carry if, having been separated from the troop, you find your way out to the city but otherwise have no way to make a phone call, get a taxi, or buy a hamburger.



## Optional Items

The term "optional" carries with it the caveat that luxury can bring additional weight and bulk. However, there may be specific situations where some additional gear is worth the costs. Swim trunks are great if we are near a lake or deep pool in a stream, although regular hiking shorts that will dry quickly may be adequate in hot weather or when packing light. Some other examples of optional gear include fishing rod and reel (bring a valid fishing license), leisure books or deck of cards if it rains, binoculars or compact (waterproof) camera, frisbee or ball, star map or wildlife identification manual. Adult leaders typically bring a camera to take a group photo to document arrival at our destination.



## **No Electronics**

Scouts are asked to leave behind their cell phones, iPods, radios, video games, CD or DVD players, and other electronics. We do permit hand-held game and music devices in vehicles on long trips, but these stay in the vehicle when we arrive at our trailhead.

We have three reasons for this. First, we intend to provide the Scouts an outing rich in new experiences. If a Scout is playing a Game Boy, he will be missing important experiences. For example, often a deer will be seen for only a fleeting moment. And how can the Scout begin to learn the calls of birds if his ears are filled with the howling of a rock star from a Walkman? Second, leaders become annoyed at having to repeat instructions for Scouts not paying attention. In the case of cell phones, they are useless in many backcountry areas due to the lack of reception. Finally, there is much potential for damage to delicate electronic equipment on hikes.

And no scout needs an FRS radio or GPS navigation on the trail. In particular, GPS, or global positioning system, is no substitute for developing real orienteering competence with a map and compass.

# Food & Cooking

## Water

Water is one of the heaviest things you will carry on a backpacking trip. We generally bring enough water for a day or two, beyond this we must rely on backcountry water sources. By studying water sources, the trail, and the weather, one can carry the minimum amount of water.



Filtration systems will be used by older scouts and adult leaders where needed. Scouts do not have to provide their own water filter. Nalgene-type wide-mouthed bottles are precisely designed for use with these filtration systems. Filters use a hand pump to force water through a matrix of micropores that let water pass but trap bacteria and protozoans and clarify the water. A standard coffee filter makes an excellent pre-filter if water is particularly cloudy or contains particulates that might clog the pump.

**Good:** Boiling or chemical purification  
**Better:** Hand-pump filtration, plus coffee filter

## Stoves

In accordance with Leave No Trace principles, we avoid open-fire cooking. Scouts do not have to provide their own stove. There are several types of stoves that are used for camping and backpacking. The troop provides all the necessary cooking gear required. These are assigned by the quartermaster to the individual patrols. The easiest to use and least expensive backpacking stove is the folding type that screws directly onto a propane cartridge. These are however heavy and the empty cartridge must be packed out. At high elevations or where temperatures reach extreme cold, propane bottles will either freeze or not sufficiently heat. For these situations butane is simple to use, easy to light, and maintains usefulness. White gas, sometimes used for higher elevations, is not permitted at any BSA scout camp.



For long backpacking trips, especially in severe conditions, white gas stoves are ideal. They put out high heat quickly and are economical. We avoid these in scouting because they require being fueled, primed, and supervised by adults.

If you buy a backpacking stove, features to look for include ease of assembly, sturdy components, disconnects from its fuel source easily, folds up compactly, fits into your cook pot, starts easily, lets you control the amount of heat, and requires little maintenance.

Perhaps the only way to estimate fuel remaining in a previously used stove canister is by weighing a full one and an empty one to judge when a canister is reaching empty.

**Good:** Borrow troop stove  
**Better:** Folding propane (Dragonfly, Whisperlite, Jetboil, etc.)

## Cooking Gear

Scouts do not have to provide their own cooking gear. Each patrol will bring cooking gear assigned by the quartermaster. While there are many different types of backpacking cook sets made out of exotic metals with space age finishes, we've found that aluminum works well for scouts. There is no finish to get scratched and the heat distribution is even. Many of our meals are one pot dishes, so a pot or two usually are sufficient unless pancakes are planned, then a frying pan is needed. The basic cooking utensil for backpacking is a large spoon. Occasionally a spatula is also needed. The third utensil that is necessary is a knife; the scout's pocketknife is intended for this.



## Eating Gear

Less is better when assembling eating gear. Avoid the inexpensive child's play tin mess kit still found in some camping stores. Avoid bringing heavy silverware from the kitchen at home. A spoon and a good-sized cup are all that are really essential. A traditional "Sierra cup" is metal and heavier than the more standard backpacking cups made of lighter materials. Some like to bring a complete set of eating utensils, a plate and a cup, but weight and space management limit how many items you should bring. A spork is an eating utensil designed with features of a spoon-like bowl and fork-like tines. Frisbees make good plates, and you can play with them after dinner, too. The simplest plate is the lid from a gallon ice cream tub. Very few people carry extra eating utensils, so remember to bring your own every time.



**Avoid:** Kitchen silverware  
**Good:** Lightweight cup or plate, "spork"



## Dishwashing

The most difficult aspect about backcountry dishwashing for scouts is the preparation. No food should be left on your plate, in your cup, or in the pot. The more food there is, the more our limited supply of water will be polluted. Plates and cups should be licked clean before being washed and sanitized. Dishes must not be washed directly at a spigot, fountain, or



water source; this practice will only draw animals or insects to the spot or contaminate the water. Put a little hot water into the cup and swish it around before drinking it will not only help clean it but also provide a little more hydration. A nylon pot scrubber can be useful for cleaning pans with caked on food. If you use any soap, it should be biodegradable campsuds; just a drop is enough. Any leftover water should be strained for food debris and emptied into a six inch deep cathole. All leftover food and garbage must be packed out. The importance of clean dishes cannot be understated, as diarrhea on a backpacking or camping trip can sweep through a troop.

## Outdoor Menus

Food can be a highlight of the day and center stage entertainment on an outing! It should be tasty, nutritious, easy to prepare, varied, lightweight, and able to survive the journey. Typically food is one of the heaviest items we carry. Even lightweight, low-moisture food will usually

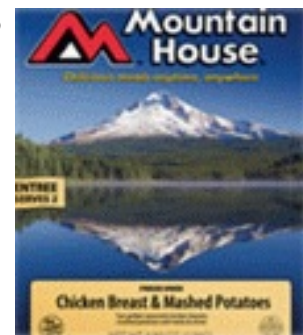


weigh between 1.5 to 2.5 pounds per person per day. However, as food is consumed, the pack becomes much lighter.

The simplest hot backpacking meals only require hot water. You can reconstitute dry and freeze-dried meals in a foil pouch, make hot drinks like cocoa, as well as hot soup and hot cereal. Some meals can be made using the boil-in-bag method.

Decisions about what to eat on a backpacking trip are made at the patrol level. Before each outing, the patrols assemble and create a menu. The patrol

uses a standard form for developing the menu so that portions and all meal elements are taken into consideration. Scouts will discuss the menu and arrange to purchase their own food as a patrol. There are many backpacking cookbooks, some of which are online, that you can look at to help plan meals with your patrol. If you do not like what the patrol proposes to eat or the portions that are planned, you must speak up at the patrol meeting. The scout's input is required because he is the one who will eat it. Menus will then be approved by the scoutmaster so that we are encouraging healthy choices.



When we backpack, breakfasts are usually quick and easy, so that we can breakdown our camp and get out on the trail right away. Some trail mix, energy bars, and fruit are all great ways to keep up your energy while on the trail. We usually do not pull out our stoves when we break for lunch. Most of what we eat for lunch requires no cooking and is fast and easy to prepare. Sometimes we'll pull out lunch on the trail. Dinners are usually big because we'll be hungry when we have hiked in and set up camp. Dinners that require a lot of water in their preparation help us rehydrate.



In addition to breakfast, lunch, and dinner, the menu usually includes a trail snack passed out after breakfast for eating on the trail during the day, like a granola bar, and a “cracker barrel” or evening snack before bedtime, like cheese and crackers.

For each meal, each patrol assigns kitchen duty positions, including cook, assistant cook, clean up, assistant clean up, and fuel and water detail.

Good meal planning prevents waste. Don’t carry anything into the backcountry that you don’t absolutely need or that you’ll have to carry out again as trash. So to reduce bulk and weight, repackage your food for the trail; take off any extra cardboard or plastic, and put items in marked ziplock bags.

See our website at  
**[www.Troop486.net](http://www.Troop486.net)**  
for links to lots of  
camping cookbooks!

# Backcountry Ethics

Some important principles govern what is courteous behavior in the backcountry.

## Leave No Trace

There are seven basic principles to respecting the wilderness and leaving the minimum impact so that it can be enjoyed by others in the future. Just like us, we want the next visitor to feel they are the first to visit.

1. Plan ahead and prepare. Know the regulations and special concerns for the area you'll visit. Prepare for extreme weather, hazards, and emergencies. Schedule your trip to avoid times of high use. Visit in small groups. Split larger parties into groups of four to six. Repackage food to minimize waste. Use a map and compass to eliminate the use of marking paint, rock cairns, or flagging.
2. Travel and camp on durable surfaces. Durable surfaces include established trails and campsites, rock, gravel, dry grasses or snow. Protect riparian areas by camping at least 200 feet from lakes and streams. Good campsites are found, not made. Altering a site is not necessary. In popular areas, concentrate on existing trails and campsites, walk single file in the middle of the trail even when wet or muddy, keep campsites small, and focus activity in areas where vegetation is absent. In pristine areas, disperse use to prevent the creation of campsites and trails and avoid places where impacts are just beginning.
3. Dispose of waste properly. Pack it in, pack it out. Inspect your campsite and rest areas for trash or spilled foods. Pack out all trash, leftover food, and litter. Deposit solid human waste in catholes dug six to eight inches deep at least 200 feet from water, camp, and trails. Cover and disguise the cathole when finished. Pack out toilet paper and hygiene products. To wash yourself or your dishes, carry water 200 feet away from streams or lakes and use small amounts of biodegradable soap. Scatter strained dishwater.
4. Leave what you find. Wood, flowers, plants, animals, insects, rocks, artifacts, and natural and man-made features are protected by law and may not be removed, collected, or gathered. Leave rocks, plants, and other natural objects as you find them. Avoid introducing or transporting non-native species. Preserve the past: examine, but do not touch, cultural or historic structures and artifacts. Do not build structures, furniture, or dig trenches.



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

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

7. Be considerate of other visitors. Respect other visitors and protect the quality of their experience. Be courteous. Yield to other users on the trail. Step to the uphill side of the trail when encountering pack stock. Take breaks and camp away from trails and other visitors. Let nature's sounds prevail. Avoid loud voices and noises.

### **Duties of the Trailmaster**

The trailmaster is the adult leader who is in charge of a hike. This may be the scoutmaster or another adult leader who reports to the scoutmaster. The trailmaster is responsible overall for the hike and the safety of all. To make each trip pleasant for everyone, please follow the instructions of the trailmaster. His job includes conducting or delegating the following tasks:

Communication, updates  
Hazardous weather assessment  
Health & safety assessment  
Maps and navigation  
Pacing, crossings, breaks, regrouping

Pre-trip briefing and instructions  
Trail courtesy  
Trailside classes  
When to eat lunch  
When to seek shelter or turn back

### **Trail Customs**

Backpacking is a group activity and requires teamwork. When we park at the trailhead, we face vehicles outward. Before heading out on the trail, we gather at the trailhead for pre-trip instructions, distribution of maps, a head count, an assignment of buddies, leaders, and sweeps. If there is a registration box at the trailhead, sign in. Officials of the agency in charge will then know where you've gone.



About ten minutes after we start, we stop briefly to allow for removing warmer layers and adjusting straps, laces, and gear. Then we try to establish a consistent pace. Setting a good pace will enable everyone in our group to enjoy the trek. Standard procedure on the trail is for one adult to be at the front, one at the back, and the rest of the adults are spaced along the line. We want to spread out about six to ten feet apart to see where we are going to avoid hazards or collision if there is a sudden stop. But we avoid getting spread out too far. We maintain visual contact with the rest of the unit and stay in hearing distance of one another. We do not take short-cuts such as cutting across switchbacks. The adult leaders may use FRS radios to keep front and back in contact.

We will regroup—that is, stop until everyone catches up—under several conditions: for rest breaks and trailside classes, if we get too spread out, if the trail forks, at an extreme water crossing or crevasse, when first aid is needed, for trip re-evaluation or map study, for leader briefings and group updates. We may stop at approximate 20 minute intervals to hydrate. We position our water in our packs to avoid having to remove our packs.

When hiking or backpacking, anyone in the unit has a right—and even a duty—to call a halt to the entire group when necessary. Every member should be encouraged to call a stop to check a hot spot, adjust a pack, adjust layers of clothing, eat a snack for energy, drink some water, or any other reason. On a hike, the last guy in at a stopping point, who is probably the slowest, will need more time to rest. Stronger backpackers should be expected to help those who are less able and give encouragement to slower ones. When necessary, leaders should redistribute equipment and food to lighten the load of someone who is having a problem.

When we meet others on the trail, we greet them cheerfully. On a sloped trail, we give the right-of-way to the upward-bound traveler. We may ask how the trail is ahead and offer information on the trail we have just hiked. We have our permits available if asked for by a ranger—and they do ask. Let the ranger know of any important trail conditions.



There are many ways that trails may be marked in outdoor recreation areas. Paint, carvings, metal tags, and flags are sometimes used as trail markers, but these scar the land and should be avoided. One form of trail-blazing, called a “cairn” or a “duck,” is a pile of at least three stones balanced one on top of the other that will denote a trail in the backcountry. A pointed rock in the stack, like the beak of a duck, may be present to indicate the direction of travel. These are usually built from local stones. A good trail marker should be easily recognizable. Two rocks do not make a trail marker--this can be just a random occurrence. If you see five rocks of decreasing size in a neat, vertical stack, you can be almost sure you have a marker. While you should not build trail markers yourself, if you find one do not remove it or knock it down.

If you come to a fence, do not climb over; a fence means stay out or go around. If you come to a gate, after passing through, leave it in whatever position you found it—either opened or closed.



When you come across a horse on the trail, always listen to the rider of the animal. If they don't have any specific instructions, then move to the downhill side facing the trail so you won't be confused with a predatory animal that would



tend to stalk from above. Your backpack can look odd or scary to a horse, so you want to be facing the animal. You can usually speak quietly to the horse; this often reassures it that you are in fact a human.

Officially, cyclists are supposed to yield the right of way to hikers. The truth, however, is that they really can't yield much when they are flying down a trail and may only see you at the last moment. So when you see a bicycle, alert those around you and move off the trail.

## **Camp Manners**

Treat others as you would like to be treated. Show respect to all other scouts and adults. Participate in activities and pitch in to help with patrol duties without complaint. Make due and avoid waste. Follow the direction of your leaders. Trust each other and work at being worthy of that trust. Live up to your responsibilities.

Firearms and axes may only be possessed or used with the permission of the adult leaders and only within strict confines for certain activities.

No dangerous behavior, like fighting, hitting, tripping, shoving, or throwing objects. No throwing rocks or swordplay with sticks. Smoking or other use of tobacco is prohibited. No possession or use of illegal drugs or alcohol. No hazing. No profanity.

Because you are on a scout outing, you are not free to "wander off." If you need to leave the group, even temporarily, you must let an adult leader know. Stay within boundaries set for the event.

Lastly, after we strike our camp, the last thing we do before leaving is comb the site to pick up any traces of trash that otherwise might have been left behind.

## **Campsite Selection**

When pitching your tent, select a site that is well away from trails, water, other people, and toilet areas. The land should be well-drained, flat, and level. There is nothing worse than sliding down the inclined floor in your bag all night long. Low-lying areas are subject to water collection if a

sudden storm should occur, so avoid dry streambeds and pitch your tent above high-water marks. While you shouldn't camp at the bottom of a hill because of flooding, you shouldn't camp near the top either because you'll be exposed to wind and rain.

Choose natural, protective windbreaks like boulders, clumps of brush, trees, behind which to pitch your tent. Pitch the rear of your tent into the wind to protect the entryway from wind and rain. Make sure there are no stones or sticks directly under the floor that could pierce through. Establish consensus on rules of the tent related to eating, drinking, and wet clothing in the tent.

## Wilderness Sanitation

When there is no bathroom out in nature, what do you do? 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. In most locations, burying solid human waste is allowed but must be packed out from other areas.



What is important to remember is you should always take care of business at least 200 feet away from any water source, campsite, cooking area, or trail. Never urinate directly on a tree or a plant because the salts will draw wild animals to chew or claw at the plant, killing it. To dispose of solid waste, dig a small sump or "cathole" six to eight inches deep, then cover and hide it after use. If you're not sure that your patrol has a pack trowel, you might want to make sure you have one yourself.

Sometimes called the "eleventh essential," toilet paper must be packed out as trash in a ziplock bag to keep it clean and separate. Toilet paper takes a long time to decompose. Do not bury it. If open fires are permitted, we may burn the paper, but be prepared to pack it all the way out.

The simplest and most important thing you can do to contribute to hygiene is wash your hands, especially before food preparation or eating. Use water and biodegradable campsuds or an alcohol-based hand sanitizer, then rub. Hand sanitizers do very little to remove or kill viruses, but they are an effective deterrent against bacteria and fungi. There is nothing worse than getting sick in the backcountry.

## Leadership

"The Patrol Method is not ONE method in which Scouting can be carried on. It is the ONLY method!" – Lord Baden-Powell, the Founder of Scouting



You may be entering the troop from having recent experience in a cub scout pack and den. The cub scout and boy scout programs are fundamentally different. Cub scouting is a program led and run by adult volunteers. Boy scouting on the other hand is designed to be a boy-planned and boy-lead program with guidance and supervision from adult volunteers.



The patrol is a group of Scouts who belong to a troop. The patrol method allows scouts to interact in a small group outside the larger troop context, working together as a team and sharing the responsibility of making their patrol a success. A patrol takes pride in its identity, and the members strive to make their patrol the best it can be. Patrols will sometimes join with other patrols to learn skills and complete advancement requirements. At other times they will compete against those same patrols in Scout skills and athletic competitions.



The members of each patrol elect one of their own to serve as patrol leader. The troop determines the requirements for patrol leaders, such as rank and age. Patrol size depends upon a troop's enrollment and the needs of its members, though an ideal patrol size is about eight Scouts.

Camping, backpacking, and hiking offer a unique opportunity for each patrol to really develop as a high-performance team. It is not only an opportunity to work together in developing team skills, but it also provides the chance to learn about each other and to use that knowledge to excel.



The patrol method gives boy scouts an experience in group living and participatory citizenship. It places responsibility on young shoulders and teaches boys how to accept it. The patrol method allows Scouts to interact in small groups where they can easily relate to each other. These small groups determine troop activities through their elected representatives.

Patrol spirit is the glue that holds the patrol together and keeps it going. Building patrol spirit takes time, because it is shaped by a patrol's experiences—both good and bad. Often misadventures such as enduring a thunderstorm or getting lost in the woods will contribute much in pulling a patrol together. Many other elements also will help build patrol spirit. Creating a patrol identity and traditions will help build each patrol member's sense of belonging. Patrols are kept intact under all circumstances.

The teaching of leadership is one of the most important goals of the scouting movement. Boy scout troops are boy-led. Boys are elected to leadership positions by their peers. The scoutmaster only steps in where



there are serious safety issues or breaches of BSA policy. While the boys are not expert leaders and they will make mistakes, this is all part of the learning process. Our outings could be much better led if the adults would make all the decisions, but the boys would not only lose the opportunity to learn leadership, they would also lose interest and the troop would become nothing more than a group of adults and kids who go camping.

One of the most important things you can do as an adult to support the boy leaders is to respect them and follow the “chain of command.” Scouts take direction from their patrol leader. Patrol leaders take direction from the senior patrol leader. The senior patrol leader takes direction, if



appropriate, from the Scoutmaster and assistant scoutmasters. What you should not do as an adult is to use your inherent authority as an adult or parent to give direction or orders to any scout, even your son, during a scouting event. This undermines the authority of and respect for that scout’s leader. We understand that this is not easy to do.

Of course, if there is a life-threatening situation, and you cannot summon an adult leader to intervene, please act to stop the threat. However, as soon as possible, allow the troop’s leadership structure to take command of the situation. Please allow the leaders to determine how the situation should best be addressed. No fewer than four adults go on any backcountry expedition or campout, so if an accident occurs two adults can stay with the injured and two can go with the troop for help.

Boy scouting is a wonderful, if not the best, way for a boy to become a young man and then become an adult. When going on an outing, it is his best opportunity to operate outside the confines of his family. His patrol and troop provide the structure for his actions.

As the parent of a scout, the best thing you can do for him is to allow him to have the same experience and accomplish the same growth as his patrol mates who do not have parents along on the outing. Your son will appreciate you for this. In practical terms, this means that you should not “hang out” with your son. The adults socialize with the other adults. Instead, step out of your role as a parent. The adult leaders have all gone through this and are quite willing to assist. Rather than giving guidance to your son, mention something to another adult leader and we will take the appropriate steps.

On the other hand, if you are the parent of a child who is not a scout during an outing, you are still responsible for supervising your non-scout child.

See our website at  
**[www.Troop486.net](http://www.Troop486.net)**  
for the roster of each  
of our patrols!





# Safety

Each person in the troop is responsible for contributing to a safe adventure. Risk management is best accomplished when each individual member of the troop on an outing is committed to not only following group guidelines, but also staying alert for potential risks and communicating to the group when a potential risk needs to be evaluated. Prevention is generally easier than treatment.

## Outing Approvals

Each outing is approved on a BSA tour permit form in advance by the council office. Requirements for an outing to be approved include having leaders on the event who are trained and qualified in CPR, first aid, youth protection, and hazardous weather. For aquatics, additional training is necessary. A parent permission slip will be requested for each scout to attend each outing. The troop will carry a copy of the medical record and treatment consent form for each participant and each participant should carry their own as well. Depending on the route and destination, we may also carry a wilderness permit, campsite permit, fire permit, parking permit, or other special use permits. Each of these contributes to our safety in the field.

## Caravan Etiquette

When ferrying a large group of scouts to a remote trailhead, we may caravan in multiple vehicles. Safety is our prime concern. If you are driving, please inspect your vehicle for road-worthiness before the day of the trip. This includes not only making sure you have a sufficient gasoline reserve in your tank but also checking tire pressure to insure proper inflation and checking fluid levels (oil, brakes, power steering). If you have a radio, check the batteries.

Do not leave the starting point until the rest of the group is ready. You will customarily be issued a map or driving directions by the trailmaster; please adhere to the route that has been chosen so we stay together. We will discuss any unique issues about the trip before we leave. Drivers should exchange cell phone numbers so we can easily communicate if problems develop or changes need to be communicated while on the road.

A “lead vehicle” and “last vehicle” will be designated. Other caravan vehicles should not pass or fall behind these two unless it is relayed to the trailmaster beforehand. The lead vehicle should maintain a safe speed that all caravan vehicles can maintain and not zig-zag around traffic to get ahead. Caravanning is not a race.

See our website at  
[www.Troop486.net](http://www.Troop486.net)  
for standard BSA  
forms and consents.

If we decide to use radios, the frequency will be announced and should be set before we disembark. If we are using radios, the lead vehicle should be able to communicate clearly with the last vehicle. If not, then a “relay” vehicle in the middle of the caravan should be designated to forward messages if the lead and last vehicles lose contact with each other.

If entering a freeway, caravan vehicles should make a smooth and safe transition to merge into the flow of traffic so other caravan vehicles aren't cut off and left behind. Similarly, when exiting a freeway, caravan vehicles should not suddenly swerve over multiple lanes to get to the ramp; they should allow ample lead time so all caravan vehicles can position to exit.

Please be courteous to all drivers on the road. Observe the speed limit and all traffic laws. Turn on your parking lights or daytime running lights.

During the trip, the caravan must not impede the flow of traffic or cause other traffic to slow. Let other vehicles pass. The caravan should allow enough following distance between vehicles to allow other vehicles to safely merge to change lanes and reach exit ramps and side streets. So don't follow other caravan vehicles too closely. Safe stopping distance is one vehicle length for each ten miles per hour of speed.

At the same time, try to keep up with the group. If the caravan is broken up by a stop signal or other interference, the lead half should slow to allow the tail to catch up. The lead vehicle should exit or pull to the side to keep the caravan together. Doubling-up at traffic signals will compact the group in order to avoid a long line being “shredded” by changing stop lights. Go back into a single file when moving through green light areas.

The lead vehicle is responsible for signaling upcoming turns, freeway or lane changes, or road obstructions. At the same time, stay alert and watch the vehicle in front of and behind you. When the vehicle in front applies their brakes to slow or uses their turn signal, do likewise for the benefit of those behind you.

If a pit stop is needed, give the lead vehicle plenty of notice in order to find an appropriate stopping place for the entire caravan.

If a caravan vehicle is having trouble, signal with flashing headlights or by cell phone or radio. The troubled vehicle should pull over to the side or exit as soon as safely possible. The last vehicle should pull over with the troubled vehicle to assist. A new last vehicle should be designated and the rest of the caravan should exit the next off-ramp and wait. Once a vehicle has indicated trouble, no one else in the caravan should talk on the radio or cell phone except the lead vehicle, last vehicle, and the troubled vehicle.

If law enforcement stops a caravan vehicle, the rest of the caravan should exit the next off-ramp and wait for the stopped vehicle, unless otherwise directed by law enforcement. If a caravan vehicle is separated from the group, try to re-establish contact with a cell phone. If a caravan

vehicle chooses to not stay with the group, please announce your intentions to the lead vehicle, so the group is not confused and doesn't go out of its way to go after you.

## Staying Found

Prevention is much better than cure, and so the best way to avoid the problems associated with being lost is to not get lost in the first place. "Stay Found." How best to do this?

Don't hike by yourself; always stay together. We don't separate our patrols. We stay within visual and yelling distance. Whenever you come to a fork in the trail, stop and wait for the whole group to come together, so that we make sure everyone stays on the same trail. If you do go away from camp or the trail—to fetch water, to explore, or to go for help in an emergency—do not go alone, remember to take a buddy and tell someone where you are going.

On the other hand, it is equally important to think through what to do if you in fact do become lost. First, stay in one place. Signaling devices like mirrors or whistles are helpful, but staying in one place will help the most. Search and Rescue will be able to find you more easily and quickly if you just stay put. Give rescuers a chance to see you, so stay out in the open a little. Remember to stay warm; exposure is a far bigger problem than dehydration. You can stay healthy for several days without water, but you might not last overnight in severe cold or if you get wet.

If a scout is lost, boys are not sent out on searches; this job is reserved for rangers, sheriffs, or professional search and rescue.

## Campfires

Nothing beats the back to nature experience of having a campfire—it can be your stove, your clothes drier, and your television set, but do it with safety and principles of Leave No Trace in mind. You'll be more



relaxed, and comfortable, with the piece of mind that you're doing it right. Whether you're building one for cooking, warmth, or just for that campfire atmosphere, there are a few things you should do first.

In many situations in our mountains, there are seasons and conditions in which open fires on the ground are strictly

prohibited, and so we will be restricted to the use of our camp stoves only. Open wood fires and barbecues are not permitted outside developed forest service campgrounds and picnic areas. Open fires



See our website at  
[www.Troop486.net](http://www.Troop486.net)  
for some cool  
YouTube videos  
about safe fires!

have been known to reach underground tree roots and smoulder for days before reaching the trunk and igniting.

If our site has a designated fire pit, it must be in good repair and free of hazards like nearby dry grasses or overhanging tree limbs. Tents should be at least 15 feet from any campfire. Sparks from a fire can travel and could land on your tent, or camping gear and catch fire. Have a bucket of water, or sand, or even a shovel close by, just in case the fire gets away on you. Never use gas, or any other flammable liquid to get your fire started. Instead, use crumpled up newspaper and kindling.

Stay with your fire; sure there are lots of distractions, and other things to do while camping, but once you've started that fire, it's your responsibility to stay with it at all times. It may be tempting to get a roaring fire going, but try to keep your fire to a reasonable and manageable size. If you put a stick into the fire, it must stay there; we do not play with sticks on fire.

Now that you've enjoyed the fire, let's make sure that it's totally extinguished. Pour lots of water on the fire. Thoroughly drown it out. If you simply cover it with sand or dirt, the fire may be out, but heat will remain, and could restart. Never walk away from any smoldering embers. Don't leave a fire until it's "OUT COLD."

So you've had a great day, the fire is out, now it's time to turn in. But before you do, remember! Never use any flammable liquid (gas, kerosene, propane etc.) burning appliance inside your tent.



Not only could a fire result, but you could also be exposing yourself to carbon monoxide poisoning. A heater in a tent is potentially hazardous as well. If you need a light in your tent, use a flashlight or battery-powered lantern.

Similarly, never cook inside your tent or have open flames inside your tent. Nylon tent fabric melts and can burn. Fires burn the oxygen you need to breathe and produce fumes that can be deadly.

## **Water Purity**

Even with a water treatment system, select the best water you can find. In one research study of 22,000 backcountry water samples nationwide, all were contaminated to some degree. So assume that water from springs, creeks, streams, ponds, lakes, and other natural sources is contaminated.

Backpacking requires making some common-sense judgments when choosing a water source. It's always better to start out with water that is most likely to be fresh. Try to determine the water source. The closer water is to its source the less chance it has to



become contaminated. The higher up you are in elevation the better your chances of finding fresh water closer to the source. A mountain stream fed by snowmelt will start out much cleaner than a lower elevation stream.

Fast-moving water is preferable to the still water of ponds and lakes. Moving water can also be filtered through trees, moss, and rocks.

Check to see how cold the water is. Water is colder near its source—the farther it travels the warmer it will get.

Feces are the biggest water contaminant. With this in mind, never choose water found close to grazing animals—cattle, horses, sheep, etc., or below a beaver dam—if you can avoid it. Try to avoid water situated below camping areas or shelters.

In Southern California, filtration is the preferred method of ensuring that water is pure by eliminating water-borne bacteria and protozoans. Purification, on the other hand, is not necessary, as water does not typically contain hazardous viruses. Purifiers use a combination of filtration and chemical treatment, deactivating both bacteria and viruses too small to be trapped by filtration alone. Iodine or chlorine treatment is cheap and ultra-lightweight, but it requires a lengthy wait before the water is safe, and, more importantly, it tastes terrible unless you mask it with gatorade powder or bouillon. These are costly and best for foreign travel where water sources are more apt to be this suspect.

As an alternative, water-borne microbes cannot survive a rolling boil. Five minutes should suffice. The only problems with boiling are that, although safe to drink, it takes a lot of heavy fuel to boil all your drinking water and dirty water just stays dirty. A paper coffee filter is good to pre-strain floating material from this water.

Symptoms of water-borne parasites can include diarrhea, headache, stomach cramps, and nausea.

## **First Aid**

Among the best texts for proper first aid is the section on first aid in the Boy Scout Handbook. Adult leaders are encouraged to take BSA and outside courses in wilderness first aid. There are several first aid conditions that the beginning backpacker should be minimally acquainted with before a first foray into the woods. Following are some of the most important to know about.

## **Blisters**

The most common outdoor injury, blisters—usually on the feet or hands—are caused by friction or heat. The best method of prevention is gloves when using trekking poles or hand tools and well-



fitting footwear with an adequate breaking-in period and dry socks with adequate padding when hiking. When a blister is forming, the first sign is a “hot spot.” There is never any shame in requesting a stop during a hike to check on a hot spot on your foot. It is far worse to let a hot spot develop into a blister that can affect the trip for everyone. Friction blisters are best treated with a combination of gel pads and a moleskin “doughnut” that will remove all friction and kept clean and changed daily. Small thermal blisters can be treated by quick immersion in cool water then applying a field dressing.

## **Cuts & Bruises**

Hiking through uneven terrain can result in minor injuries. Individual scouts carry their own first aid kit appropriate to their developmental level. We carry a troop first aid kit as well. However, cuts and bruises should be reported to adult leadership and evaluated for treatment.

Cuts are skin ruptures or incisions that do not lie on major veins or arteries, and therefore do not gush blood. Scratches are like cuts, only they don’t break the skin enough to cause bleeding, except for maybe a little trickle. Take care of the wound promptly. Wash the wound with soap and water, then if there is still bleeding, apply direct pressure to the wound until it stops. Then apply an antibiotic cream or ointment and cover with a sterile bandage. Keep it covered. Avoid putting a cut into your mouth; there are lots of nasty germs in there that can promote infection. Avoid using hydrogen peroxide or rubbing alcohol on a wound, they actually break down scab tissue and may kill too many of the wrong kind of germs.

## **Sprains & Strains**

The most common sports-related injuries primarily are overuse injuries. As the name implies, an overuse injury results from wear and tear on the body, particularly on joints subjected to repeated activity. Sore leg muscles from long treks are quite common. Mountain climbers sometimes pull muscles in the legs and back, and often have sore knees or ankles from trying to stop their weight as they climb down trails and off of rocks. Ankles get twisted from “bouldering”—stepping from boulder to boulder. A sprain is a connection between muscle and bone getting stretched beyond capacity. A strain is a muscle stretched beyond capacity. In either case, the remedy is non-use and rest. Ice or emersion in cold water from a stream may help as well.

## **Cramps**

A skeletal muscle that involuntarily contracts is called a cramp or a spasm. It may twitch or feel harder than normal. It can be very painful. Insufficient stretching before exercise, poor circulation, large temperature changes (either hot or cold), muscle fatigue, dehydration, and electrolyte imbalance may all play a role in their causation. Remedies include rest, gentle stretching or soft massage, applying warmth, and drinking plenty of water.

## **Exhaustion**

At the end of the day, it's great to roll into camp and settle in to rest and recuperate. Fatigue on a backpacking trip or day hike should be expected. However, true exhaustion is a source of concern because it represents the accumulation of fatigue due to using more energy than you are replacing. Not only are your reserves being depleted, but also being depleted are your efficiency, your margin of safety, and your fun. If you find that you are needing longer and more frequent rest stops, it is time to communicate with troop leaders and time to slow your pace.

## **Sunburn**

Easy as this problem is to prevent, sunburn occurs with some regularity. Exposure particularly in youth can have serious cumulative, long-term consequences. Simple steps to take include applying a sunscreen with an SPF of 15 or higher a half hour before exposure, reapplying sunscreen after sweating or swimming, reapplying it several times a day if exposed all day, wearing a wide-brimmed hat, and wearing long-sleeved shirts and long-legged pants. Sunlight at higher altitudes or reflected by water or snow can be intensified. Sunburn can occur even on overcast days because UV rays can pass through cloud layers. You can sunburn your eyes and this condition can be very painful. Manage sunburn as a first-degree burn and treat the after-effects with cooling, moisturizing cream, or aloe vera.

## **Dehydration**

Adequate hydration is a part of overall troop risk management, no matter what the weather. Dehydration occurs when you lose more fluid than you take in and your body doesn't have enough water and other fluids to carry out its normal functions. Common causes include diarrhea, vomiting, fever, or excessive sweating. We may need as much as 2-4 gallons of water per day, especially when under the exertion of carrying a backpack. Inadequate intake of water during hot weather or strenuous exercise also may deplete your body's water reserves, but dehydration can occur in cold weather as well.

You may notice signs of dehydration such as a dry sticky mouth, nausea, profuse sweating, sleepiness or fatigue, dark color to urine, thirst, decreased urine output, muscle weakness or cramps, headache or body aches, dizziness or lightheadedness, and mental confusion or incoherent speech. Reach a physician if symptoms worsen. If core body temperature rises above 105 degrees Fahrenheit, this may constitute a true life-threatening emergency, called heat stroke.

Water, cooling, and rest are important elements of treatment. You can usually reverse mild to moderate dehydration by increasing your intake of fluids and getting into the shade or spraying yourself with water. But the safest approach is not to become dehydrated in the first place. So the best preventative is to not wait until you are thirsty to drink water. This means drink fluids periodically throughout any period of exercise or hot weather, before you become thirsty.



## **Hypothermia**

The most likely of environmental injuries in the outdoors, hypothermia occurs when more heat escapes from your body than your body can produce and your core body temperature drops below 95 degrees Fahrenheit. While severe hypothermia can lead to death, for most people, hypothermia isn't a serious risk. Still, each year nearly 700 people in the United States die of hypothermia.

Wet, cold and wind all contribute to hypothermia. Prolonged exposure to cold air or cold water temperatures are common causes, but hypothermia does not require freezing temperatures; a cool, windy rain or swimming too long or in chilly water can be a sufficient cause.

Prevention involves adequate layering of protective clothing to prevent body heat from escaping. Wet clothing and cold weather can accelerate heat loss. Wearing lightweight layered clothing is best for wind protection. Hats and gloves are helpful. Stay as dry as possible with special attention to places where moisture can enter, such as mittens or boots.



When you're outdoors enjoying such activities as camping, hunting, fishing, boating and skiing, be aware of weather conditions and whether you or others with you are wet and cold. If you get cold and wet, move indoors and get warm and dry early—before you develop hypothermia.

Symptoms include uncontrollable shivering, numbness, vague, slowed or slurred speech, memory lapse, incoherence, irritability or anxiety, loss of coordination, muscle rigidity, frequent stumbling, and exhaustion or drowsiness. The person is seldom aware of the problem as it occurs; it is observers who will identify these symptoms.

Treatment involves fluid, warmth, and dryness. Moving the person out of the cold and away from the cold ground is important. Thermally stabilizing a patient is the primary goal. Remove wet clothing and replace with dry clothing. Insulate the person, such as covering them with an emergency blanket. Monitor breathing. Provide warm, electrolyte-rich beverages and quick energy food if the person is alert and able to swallow. Don't apply direct heat. Don't massage or rub the person. Reach a physician if symptoms worsen.

## **Altitude Sickness**

High altitude, or mountain, sickness is defined as when someone feels sick at high altitudes, such as in the mountains.

Most people can climb up to 8,000 feet normally. High altitude sickness, or acute mountain sickness, can begin to occur at elevations of 6,500-8,000 feet. Generally, different people have different susceptibilities to altitude sickness. It is hard to determine who will be affected by altitude-sickness as there are no specific factors that predict this susceptibility.

Altitude sickness usually occurs following a rapid ascent. In most cases, the symptoms are temporary and usually abate as altitude acclimatization occurs. However, in rare or extreme cases, or at higher elevations, altitude sickness can worsen and require evacuation or medical attention.

Symptoms include headache, fatigue, stomach illness, dizziness, and sleep disturbance. The rate of ascent, altitude attained, amount of physical activity at high altitude, as well as individual susceptibility, are contributing factors to the onset and severity of high-altitude illness. Exertion aggravates the symptoms. Symptoms often manifest themselves 6-10 hours after ascent and generally subside in one or two days, but they occasionally develop into more serious conditions.

The best prevention is by pacing an ascent to allow gradual adjustment to higher altitudes, and we practice this in our troop. The primary treatment for altitude sickness is immediately retreating to a lower altitude and obtaining some rest.

## **Poison Oak**

“Leaves of three, let it be.” If you recognize a patch of poison oak on the trail, alert those behind you that they are approaching it.

Poison oak is endemic in our local mountains and can grow in large patches. Ranging widely in color from dark green to brown to rusty red, it can mimic a number of coexisting plants. Part of the year, the plant has no leaves at all. 80% of people have some sensitivity to poison oak.

Poison oak is a cause of a skin irritation that may result in a red, itchy rash consisting of small bumps, blisters, or swelling. These rashes generally aren't serious, but they start after a day or two after exposure and last up to 30 days.

Poison oak materials should never be burned in a campfire because burning will release the oil into the air where it can be inhaled. Areas that are being cleared of brush may raise dust containing the oil as well. Clothes can be infected and transfer to furniture. Family who handle these clothes to launder them can also be infected.

Treatment consists of self-care methods to relieve the itching until the reaction goes away. The irritant in this plant can take up to 10 minutes to bond with the skin. As soon as possible after exposure but no longer than 30 minutes, clean off the oily resin that contains the active irritant and rubs off the plant onto the skin. Good solvents include soap and alcohol. An alcohol prep pad can remove 80% of the irritant. Dawn dish detergent (only the blue kind) is a very good degreaser and so it can strip off the oil. However, do not use hot water which will worsen the absorption. Over-the-counter medicines can relieve the symptoms. The reaction goes away on its own. Avoid scratching the affected area. Reach a physician if the rash is widespread or if the plant has been ingested.



## Stinging Nettle

Stinging nettle is a plant that produces a painful stinging sensation in skin that comes in contact with it. Stinging nettle tends to be found along streams and in moist places such as under forest canopy. The plant can grow up to ten feet high.



On the stems and the underside of the leaves are fine, hairlike spines made of a glasslike substance called silica. They are sharp like hypodermic needles, and barbed. The sting punctures the skin and injects a toxin. The nature of the toxin secreted by nettles is not settled. The stinging hairs of most nettle species contain formic acid, serotonin, and histamine, and recent studies implicate oxalic acid and tartaric acid. Though the fresh leaves

can cause painful stings and acute hives, these last only two to three hours and are rarely seriously harmful.

## Poodle Dog

We've been getting warnings about the Poodle Dog bush, also called Sticky Nama. The Poodle Dog bush is a hazard to humans.

Poodle Dog is a fire-follower plant that is found in burned-over areas in the first few years after a fire, but the prevalence period can last as long as a decade. Its seeds can remain dormant in soil for long periods, with the plant springing up quickly when the soil is disturbed.



Poodle Dog bush has sprung up and is now very common in the area burned by the 2009 Station Fire.

It is found in chaparral, on granitic slopes and ridges from 100 to 2300 meters.

Hikers sometimes actually pick it and take it home for a flower arrangement, not knowing that contact, for the vast majority, will cause a severe skin reaction.



It's pretty, but you neither want to touch it or breathe too close to it if you encounter it in the hills. Even shaking the plant and inhaling close to it can cause a serious reaction.

Contact causes a delayed rash, or dermatitis, ranging from itching to blisters lasting as long as two weeks. Sufferers describe it feeling like a combination of poison oak and stinging nettle.

The Poodle Dog bush has highly-irritating, glandular, sticky hairs which can dislodge easily and can be passed to hikers who touch it or brush up against it. These hairs are designed to discourage herbivores.

It grows into a moderate sized, perennial woody shrub, branching from the base but with main stems extending for up to 3 meters. It can form thickets.

Its leaves are long and narrow, and may be toothed at the edge. Leaves can be from 4 to 30 centimeters long. When not in bloom, the Poodle Dog bush can appear to be a droopy collection of brownish stems topped by green pom-poms of narrow leaves, shaped a bit like a clipped poodle, prompting its name.

In spring, from June to August, the plant sprouts clusters of attractive deep blue, bell-shaped, lavender or purple flowers. However, the plant has a bad smell.

Native Americans used it medicinally to relieve swelling or rheumatism.

If you have had contact with Poodle Dog, go to your doctor if you start to itch. An over-the-counter remedy is calamine lotion or anything that has a cortisone derivative.

*Common name: Poodle Dog bush*

*Latin name: Eriodictyon parryi*

*Pronunciation: er-ee-oh-DIK-tee-yon PARE-ee-eye*

*Family: Boraginaceae (Borage)*

*Habitat: Chaparral, dry granitic soils of slopes and ridges to 7000', yellow pine forest, disturbed places and burns*

*Blooming period: June to August*

*Formerly Turricula parryi*

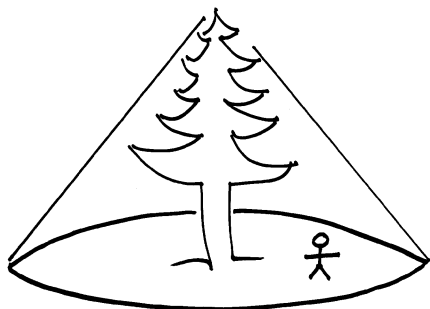
## **Lightning**

Twenty-five million lightning strikes occur each year in the United States. In the Sierras, lightning can strike with little warning. The safest way to avoid lightning is to keep an eye on the weather and be ready to move if it looks like rain. Look for darkening skies, flashes of light, or increasing wind. If you can hear thunder, you are close enough to the storm to be struck by lightning. Go to safe shelter immediately.



If a storm approaches, move to the lowest terrain available. Get down from peaks, ridge crests, and saddles; don't try to "just get over the next hill." Don't be caught as the highest object in an open meadow. If caught in an open area, spread your group out as much as 100 feet apart, crouch low in a baseball catcher's stance, and use your sleeping pad for insulation from the ground. It's not usually a good idea to be directly under a tall or solitary tree, but if you are in a forest or near

a group of trees of similar height, it should be OK. Find shelter under shorter trees where available.



Cone of Protection Around a Tall Object

A cone of protection exists around a tall object, in the area within a circle around the object drawn at a 45 degree angle from the top of the object to the ground. Do not position yourself at the outer edge or directly beneath the object.

See our website at [www.Troop486.net](http://www.Troop486.net) for some weather alert links!

Remove metal objects you may be carrying in your pack. If you carry a pack with a metal frame, remove the pack. Stay away from power lines, metal fences, waterpipes, bleachers, or picnic shelters that can draw lightning or conduct electricity. Avoid shallow caves or overhangs where ground current can follow the contours of the geology and arc. Current can travel through the ground and can travel horizontally. If you are boating or swimming, get to land and find shelter immediately because water can conduct electricity. And stay clear of areas that might have falling debris. Wait it out.

## Mosquitos

Of the 160 varieties of mosquito, all are annoying. Four million hatchlings can occupy an acre of standing water. Adults can travel 50 miles to reach you. What's worse is that sometimes they transmit serious blood-borne diseases. Although your risk of getting diseases from mosquito bites is low, your risk of being bothered by mosquito bites is high. Mosquitos are most prevalent at dawn and dusk. Using insect repellents, protective clothing, and head nets also can help. Mosquitos bloom in April-May, and outdoor trips near standing water during this time of year are apt to be prone to mosquito infestations.



Among chemical deterrents, the most common and effective contain a pesticide abbreviated as "DEET," especially when worn in conjunction with light colored clothing, long-sleeved pants and shirt, and a hat. DEET concentrations range from 5% up to 100%. This chemical blocks the insect's ability to find people who are wearing it. Unfortunately, it should not be used on the hands of young children and also tends to be absorbed through the skin as well as break down nylon in clothing and sleeping bags. Important to know is that a combination of greater than 15 SPF sunscreen along with greater than 35% DEET can result in a burn reaction; lower



amounts in youth. Most commonly, DEET should not be worn more than 8 hours per day in order to minimize absorption.

There are other chemical preparations, like picaridin, oil of lemon eucalyptus, allethrin, citronella, and others. A spray of 0.5% permethrin to treat clothing and netting before an outing will decrease the number of insects that will land on your clothing. Permethrin is an insecticide, not a repellent; it kills insects but won't chase them away.

When mosquitos are at their peak, consider head netting. Mosquito netting if properly used and maintained (no holes), provides the maximum possible personal protection against biting insects. Some nets come attached to a hat or cap. Our troop will advise you before trips when netting is recommended, usually in late Spring.

## **Ticks**

There are approximately 880 species of ticks spread over the temperate zones of the world. Ticks are blood-sucking arthropods that can transmit several diseases. More vector-borne diseases are transmitted by ticks than by any other agent.



Ticks like warm areas with high humidity. They will sit on a stalk of grass waving their clawed front legs in search of a passing host.

So, long sleeves and pant legs can help deter ticks. Tuck shirts into pants, pants into boots. Wear light colored-clothing to help reveal them. Check yourself and peers regularly. Conduct a daily full-body check. For ticks, permethrin on clothing and DEET on the skin can be very effective.

Ticks can give you Lyme disease, but only if they are attached a minimum of 48 hours, so it is very important in tick-prone regions to inspect your body, head to toe, every day on the trail.

Ticks will attach themselves to you. In the event of a tick bite, do not try to scrape a tick off your skin laterally, and be careful not to grasp the tick body. With a pair of fine-tipped tweezers or a tick puller, grasp the burrowed tick by its head as close to your skin as possible and slowly but firmly pull it straight out. Save the tick for later identification. If the embedded head breaks off and remains under the skin, or if symptoms such as flu-like symptoms, muscle aches, headache, expanding rash, develop anytime within 30 days, see a physician.



## **Scorpions**

There are about 90 species of scorpions in the U.S. The yellow-colored Arizona bark scorpion (*Centruroides sculptuatus*), found in Arizona, New Mexico, and the California side of the Colorado River, is the only species that is really of concern to most people,

since it is the one with a powerful enough venom to cause harm as a result of a sting. Scorpions are nocturnal, shelter in warm areas, and hide during the day. Some species will hide under rocks, logs and in cracks, other species will dig and hide in burrows. Prevention includes avoiding reaching into these areas, as well as up-ending boots before putting them on and keeping your pack closed during the night. Ordinary scorpion stings usually are less dangerous than bee stings and have no lasting ill effects, though they can be painful. If you are stung, cold water or ice can be helpful. Seek medical attention.

## **Bees**

A single bee is not very dangerous unless you are very allergic. Honeybees die after they sting, so they avoid it if possible. But bee venom certainly packs a punch. Beekeepers have tended to eliminate the fierce strains, and the entire race of bees has thus been gentled by selective breeding over thousands of years of bee-keeping.



Africanized honey bees, known colloquially as "killer bees," in the western hemisphere descended from 26 Tanzanian queen bees (*A. m. scutellata*) accidentally released in 1957 in Brazil. By 2002, they had spread south to Argentina and north to Texas, Arizona, New Mexico, Florida and southern California.

Africanized bees are characterized by greater defensiveness in established hives than European honey bees. They are more likely to attack a perceived threat and, when they do so, attack relentlessly in larger numbers. This aggressively protective behavior has been termed by scientists as hyper-defensive behavior. This defensiveness has earned them the nickname "killer bees," the aptness of which is debated. Over the decades, several deaths in the Americas have been attributed to Africanized bees. The venom of an Africanized bee is no more potent than that of a normal honey bee, but they have a larger alarm zone around the hive, a higher proportion of "guard" bees within the hive, deploy in greater numbers for defense, and pursue perceived threats over much longer distances from the hive.

While the Africanized bee is widely feared by the public, a reaction that has been amplified by sensationalist movies and some of the media reports, most human incidents with Africanized bees occur within two or three years of the bees' arrival and then subside. Since their introduction to the United States there have been only 14 deaths from Africanized bees over a period of several years, which makes them less hazardous than venomous snakes.

Prevention involves putting as much distance as you can between you and the hive. Don't approach a hive because bees are territorial. Don't swat at bees which will make them sting more. When bees swarm, they can be very aggressive, so don't stand still—run. Take cover in a building if you can. Run through long grass or scrub. Don't attempt to escape by getting into a body of water; bee swarms have been known to wait until you surface.

Remove the stinger as soon as possible to stop it from injecting more venom. Gently scrape the stinger out with your fingernail or a credit card; don't squeeze the stinger as this may inject more venom. Wash the affected area with soap and water. Apply a cold pack to relieve pain and swelling. See a doctor if breathing is difficult, if you are stung several times, or if you are allergic to bee stings.



## Snakes

Mention the word "rattlesnake" and you will get a mixed response that usually falls on one side of the spectrum—fascination or revulsion. The western rattler, or our local Mojave Green, is best known by the rattle at the end of its tail and diamond-shaped blotches along its back. They are most active in spring and summer and will defend itself if it feels threatened. Baby rattlesnakes are no less of a threat; they may have difficulty regulating the amount of venom they inject because of their immaturity.

Bites from venomous snakes in the United States are very rare. A large portion of those people bitten were trying to tease, catch, or kill a snake in the wild. Most other bites occur when someone steps on a snake and the snake bites in its own defense. The snake is probably more scared of you than you are of the snake.

It is worth learning to distinguish poisonous from non-poisonous snakes by their typical differences:

### Poisonous Snakes

Broad, triangular head  
Turned-up nose  
Elliptical pupil  
Heavy body  
Fangs

### Non-Poisonous Snakes

Narrow head  
Rounded nose  
Round pupil  
Smooth, tapered body  
No fangs

To prevent the rare event of snake bite, wear appropriate footwear such as boots or high-top hiking shoes. Watch where you are walking. Step up onto logs or rocks rather than over them. Don't place your hands on unseen ledges or into animal holes. Don't turn rocks or boards over with bare hands. Use a hiking stick or trekking pole to poke among stones and brush ahead of you. Learn what dangerous snakes in your area look like. Don't try to kill, catch, or tease a venomous snake; leave them alone. Most of all, don't hike by yourself.

Nonpoisonous snake bites should be treated like a puncture wound. Cleanse and treat for shock.



In the event of a venomous snake bite, remain calm and inactive. Don't make incisions over the snakebite. Don't constrict the flow of blood. Don't immerse a limb in ice water. Apply a Sawyer Extractor for no more than 10 minutes; if performed within the first three minutes after a bite, this may help reduce the effects of the bite. Evacuate the victim to medical care for treatment immediately.



### **Small Mammals**

In most cases, we will never see animals. Small mammals in the wild are primarily a nuisance. Rabbits, ground squirrels, mice, rats, marmots, foxes, coyotes, and raccoons may raid backpacks and investigate tents, so keep them secured. Skunks, easily recognized by the two white stripes along their backs, they can spray

glands from as far away as ten feet, but only do so when they feel threatened or cornered. Small animals do present a hazard of disease transmission through bites and carrying disease-bearing ticks. So, don't pick any animal up.

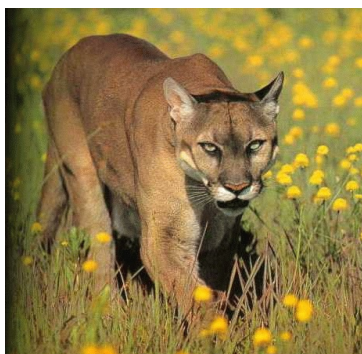


### **Deer, Elk, & Bison**

Deer are native to our local mountains and can appear very tame but they are not domesticated.

Bison may seem tame around you, but this may be because they have very poor eyesight and do not yet know you are there until they hear you or you are much too close. In general, with large, hooved browsers that can unexpectedly charge or stampede, the first rule is keep a safe distance and don't challenge, stare down, or startle them. And don't try to pose with one for a photograph.

### **Mountain Lions**



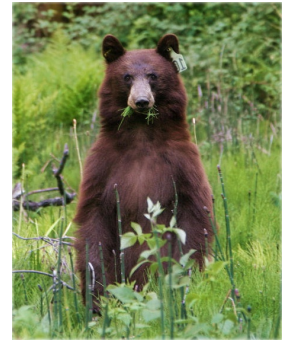
Mountain lions, also called cougars, panthers, or pumas, do appear in our local hills from time to time. They are most active from dusk to dawn. They prefer to stalk their prey and attack from behind.

Do not hike alone in areas where mountain lions may be found. Go in groups and make plenty of noise to make yourself known and to avoid surprising them. If you come upon a lion, do not run. Stay calm. Do not turn your back or bend down. Face it and make eye contact. To convince the lion that you are not prey and that you may be a danger to it, do all you can to appear larger. Raise your

arms above your head and open your jacket. Speak firmly in a loud voice. If attacked, fight back. Try to remain standing and face the animal. Lions have been driven away by rocks, sticks, hats, jackets, garden tools, and even the use of one's bare hands. Yes, this is one of the few types of situations where you are allowed to throw small rocks, but only to scare.

## **Bears**

One of the things that worry parents the most is the thought of their child encountering a bear. This rarely happens, but it is something that we should be thoughtful about because we do live in bear country. California has an estimated population of 30,000 black bears. Bears in the local area are black bears and, as such, tend to be shy, need lots of space, and avoid humans. Unlike the far more rare Grizzly, the black bear prefers flight to battle.



While every bear encounter is different, bear behavior is very rational and predictable. Problems can result when a bear is surprised by the approach of a person. In areas of restricted visibility, near loud streams, or on windy days, make your presence known and make noise. Call out, clap your hands, or sing. Stay upwind to give the bear a chance to catch your scent.

Be aware of your surroundings. Be extra alert near food sources such as animal carcasses, berry patches, and streams with fish. Look for bear-activity signs: tracks, scat, diggings, torn-up logs, and turned-over rocks. If you see a cub, the parent is nearby. If you see an animal carcass, a bear may be nearby. Avoid getting between a bear and its food or between a parent and its cub.

In a chance encounter, if you can do so undetected, then leave the area. Never approach a bear even if it is calm. If a bear is approaching, and unaware, be quiet, increase your distance, take a wide detour, and get out of the way without being noticed. All bear sightings should be reported. Dead food animal carcasses should be reported as well.

If the bear is aware of you and you can not leave the area, let the bear sense you by smell first. A bear standing on its hind legs with its ears forward is typically not expressing aggression but curiosity, to smell and see better. Give the bear the opportunity to leave. Keep the bear in sight, talk in a low authoritative voice, avoid eye contact, slowly back away from the bear. If you are in a group, keep everyone together and make noise.

If a bear comes closer, stay calm. Bears may approach out of curiosity, following food smells, asserting dominance, and in only very rare cases predation. So, stand your ground. Make yourself look as big as possible by opening your jacket or raising your arms over your head. Try to scare it away by shouting, making noise, banging pots, or throwing small sticks or rocks. Yes, this is the one type of situation where you are allowed to throw small rocks—but not to injure, only to scare.

Indicators of escalating risk from an approaching bear are woofing, huffing, jaw gaping and snapping, and paw slapping. If a bear charges at you, it will be at high speed, ears flat, on all four legs, low to the ground. If this happens, NEVER RUN, because this can trigger a chase instinct in the animal. If you act like prey, you will become prey. Many charges are actually a bluff charge: bears will often stop or veer to the side at the last moment.

However, if in the highly unlikely event that you are actually physically attacked, most wildlife experts recommend that you first play dead. Keep your pack on to protect your back, lie on your belly to protect your chest, put your hands behind your neck, and don't move at all, make no sounds. In a serious, ongoing attack, fight back! Fight back aggressively with fists or any solid objects you may have. Kick or claw vital spots, such as the bear's eyes.



Guns are not allowed in scouting. In actual practice, guns tend not to stop an attacking bear. Pepper spray can be a last-line of defense in some cases, but it must be specifically designed to deter bears, with the highest "SHU" rating and have a 30 foot reach. However, pepper spray can actually create a false sense of security; it does not make you bear-proof. And if it is not handy, it is worthless. Also, bear pepper spray tends to be heavy to carry.

Feeding any wildlife can put you and those with you in danger and is harmful to animals. Bears especially should never be allowed to obtain human food or garbage because they will become "food conditioned" and realize that human food is something to seek out.

A bear's sense of smell is 50 times more sensitive than the human sense of smell. Items that attract bears by sense of smell must be managed carefully. Therefore, the first rule is that no scout should ever bring food into his tent. In fact, there should be nothing left in a tent or pack overnight that has a smell because it might attract a bear or other animal. For example, each scout should have a set of clean clothes to sleep in. These should be clothes that are not to be used for anything else. This way, there are no leftover smells in the tent from cooking or spilling. Also, it is highly recommended to avoid scented shampoos, soaps, deodorants, etc., as part of a hygiene regimen in the wilderness. At the Philmont Scout Ranch in Cimarron, New Mexico, it is required that scouts avoid brushing their teeth after 4 p.m. for this reason. Food, even freeze-dried backpack meals in factory sealed pouches, should be double bagged in ziplock bags.

See our website at  
[www.Troop486.net](http://www.Troop486.net)  
to view a YouTube  
video about hanging  
bear bags!

Your pack should be left outside on the ground with the pockets unzipped at night; bears will not bother to unzip them but just rip them open in order to look inside. After every few usages, a pack may be washed to remove some of the scents it contains.

Each scout should have a “smellable bag” in his gear. It is only for storing at night everything that might attract animals. This bag should not double as a tent stuff sack or sleeping bag stuff sack because smells will transfer from the bag to tent gear.

We will then hang all smellable bags from ropes suspended in the trees. Each boy will be taught how to “fly” and retrieve a bear bag correctly. A bear bag should be flown at least twelve feet above the ground, at least ten feet away from any tree trunk, and five feet below a tree limb.

San Gabriel bears are starting to get smarter and have been known to reach bear bags. We will be moving toward “bear canisters.” A bear canister is a specially designed barrel with a locking mechanism; if needed these will be provided by the troop. Tents are always set up outside the “bear triangle,” a zone defined by three points—the sump or cathole, the cooking area, and the bear bag, each of which should be at least 200 yards from the other.

“Smellables” are anything at all that might smell to a bear and include many more items than you might imagine.

Smellables:

All food, even if factory-sealed	Garbage
Anything with adhesive (band-aids, duct tape)	Hand sanitizer
Bait and tackle	Insect repellent
Candy, chewing gum, cough drops	Laundry detergent
Chapstick	Lotion
Clothing that you have cooked in	Medications
Coffee grounds and tea bags	Motor oil
Cookware/dinnerware (even if clean)	Salt
Deodorant	Scented toilet paper
Dishpan scrubbers or Brillo pads	Shampoo and soap
Drinks other than water	Sugar of any kind
Empty food containers and wrappers	Sunscreen
Fabric softener sheets	Tent seam sealer
First-aid kit	Toothbrushes, toothpaste, and floss
Foot powder	Trash
	Wet wipes

### **Pre-Existing Medical Conditions**

Knowing about a condition that we may need to handle in the field is an essential part of sound risk management practices. Please share with adult leaders any conditions you or your son has that may require our awareness, monitoring, attention, specialized accommodation, or administration of medication in an emergency. We will attempt to be discreet. We will need

parental permission in order to be able to give your son any medications on an outing. All medications for scouts must be carried by an adult, such as the trailmaster or scoutmaster.

Conditions that troop leaders should be made aware of include the following that present risk factors in BSA programs and activities:

Allergies or anaphylaxis  
Asthma  
Diabetes  
Excessive body weight  
Heart disease  
Hypertension

Lack of appropriate immunizations  
Muscular or skeletal injuries  
Psychiatric, psychological, or  
emotional difficulties  
Seizure disorder  
Sleep disorders

## Conclusion

In the end, the motto “Be Prepared” isn’t just about being ready for what is probable in the wilderness. Robert Baden-Powell’s goal was that each and every Scout be prepared both in mind and body for what is possible in life and to meet with a strong heart the challenges life will present. Baden-Powell’s idea was that every Scout should prepare himself to be a productive citizen and to give happiness to other people. “Be prepared for life” by living happily and without regret and knowing that you’ve done your best. This is what the Scout motto “Be Prepared” meant for the founder of scouting.



The most valuable things we take with us into life are the judgement, knowledge, and confidence that results from learning, experience, and accomplishment. We want each outing to add to the development and growth of the scout--in his character development, citizenship training, and physical and mental fitness. We try to make sure that each scout on each outing is presented with a challenge. A new scout may be challenged to take his turn cooking his patrol a dinner, even though he has never cooked before. An older, more experienced scout may be challenged to teach this skill to a younger scout. We want to “stretch” each scout on each outing.

Whether you are an adult or a kid, we want to challenge you also, to give you an opportunity to grow. If you are a kid and not a boy scout, you will have an experience very similar to the scouts in our troop. If you are an adult, you will have an opportunity to “play” at being a boy scout and learn some of the things boy scouts do. The adult leaders will be happy to share their knowledge of scouting with you. We hope that you will make new friends, learn new skills, and most of all we truly want everyone in our troop to have a “mountain top” experience.

# Appendices

These additional materials can be found on our troop website at [www.Troop486.net](http://www.Troop486.net).

Annual Health and Medical Record

Parent Authorization for Scout Medication

Climbing, Rappelling, & Bouldering Consent Form

Parent Permission Form

Backpacking Equipment Checklist

Snow Camping Essentials

Class-B T-Shirt Order Form

Field Guide to Scout Advancement Activities During Day Hikes and Backpacks

Additional Resources

# Additional Resources

## Suggested Websites

<a href="http://www.troop486.net">www.troop486.net</a>	Troop 486
<a href="http://www.scouting.org">www.scouting.org</a>	BSA National Council
<a href="http://www.bsafieldbook.org">www.bsafieldbook.org</a>	BSA Fieldbook Companion
<a href="http://sgvcbsa.org/leadersandresources_training.php">sgvcbsa.org/leadersandresources_training.php</a>	BSA Online Training Courses
<a href="http://www.scoutstuff.org">www.scoutstuff.org</a>	BSA Retail Scout Gear

## Suggested DVDs

(2004) The beginners guide to camping. National Video Documents, Inc.  
Paley, J.F., & Haxo, B. (2008). Poles for hiking, trekking, & walking. AdventureBuddies.  
Person, D., (2003). 50 outdoor skills everyone needs to know. Mamishome Productions.  
Ward, G. Survival beyond the 10 essentials. Talisman Productions.

## Suggested Books

(2004). Fieldbook. Irving, TX: Boy Scouts of America.  
Baden-Powell, R. (1913). Scouting for boys.  
Brown, A. (1998). Easy hiking in Southern California: 100 places anyone can hike this weekend. Petaluma, CA: Foghorn Press.  
Forgey, W. (1999). Wilderness first aid (Second Edition). Old Saybrook, Connecticut: The Globe Pequot Press.  
Ladigin, D. (2005). Lighten up! A complete handbook for light & ultralight backpacking. Connecticut: Guilford.  
Marrone, T. (1996). The back-country kitchen: Camp cooking for canoeists, hikers, and anglers. Minneapolis, MN: Northern Trails Press.  
Robinson, J.W., & Christiansen, D. (2005). Trails of the Angeles: 100 hikes in the San Gabriels (8th Edition). Berkeley, CA: Wilderness Press.  
Tyler, J. (2002). Campgrounds of Los Angeles and Orange Counties. San Diego, CA: Sunbelt Publications.

# Notes