Troop 750 Hiking & Backpacking Guide

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Part I - Basic Hiking Skills

Introduction

Enjoyable hiking depends on having the right boots, clothing, food, water, and the knowledge of how to go about it. Properly equipped, you can travel 20 miles or more in a day. The purpose of this guide is to present the equipment and methods of hiking and backpacking in a way consistent with Leave No Trace ethics.

But why hike? To get away from the noise and clutter of modern civilization. To see and experience nature at its own speed. To take on a physical challenge. Your reasons for hiking should help determine the place and distance of a hike.

Boots, Socks and Feet

Troop 750 requires that Scouts participating in hiking and backpacking have mid to high top, waterproof boots. Although some ultra-lightweight backpackers use running shoes, their ankles have certainly had many years of strengthening before trying this.

Because the method of propulsion is your feet, there is nothing as important as your boots, socks, and care of your feet. The major enemies of your feet are moisture and friction. When your feet sweat or get wet from rain or dew on grass, the skin becomes wrinkled and soft. Friction between toes or between any part of the foot and the boot can quickly produce painful blisters which can bring even the strongest hiker to a crawl.

Eliminating these problems requires getting the correct fit of your feet, socks and boots. Fitting cannot be done one item at a time, but must be done together.

Socks are a key part of foot comfort. There are many different types of socks made for hiking and backpacking. Some of their more important features are extra padding in the heel and toe and layers of material which help wick moisture away from the foot and into the outer layers of the sock. A medium to heavy weight hiking sock or a medium weight backpacking sock is probably the best. There are also liner socks made which do a better job of wicking moisture away from the feet. These are available as a thin nylon sock or a thicker sock made of polypropylene or Coolmax. Whether you need the separate liner sock will be something that experience will tell. The thicker liner socks will affect boot fit a little and can be useful in filling out a boot which is a little big.

Fitting Boots

Boot fit is very critical and must be determined wearing the type of socks that you intend to use. The greatest mistake is assuming that your boot size is the same as your street shoe size. Because you will sometimes walk on steep downhill grades, it is imperative that none of your toes can reach the end of your boots. If this happens, blisters or, worse yet, toenail loss will occur.

There are two critical parts to boot fit. First, with the boot laces loose and your foot forced forward until the toes touch the end, there should be room to easily put two fingers behind the heel. Second, the laces must be able to draw the boot across the top of the foot and hold your foot in place. If the boot is too wide, it will not be able to do this and the foot will slip continuously, causing blisters in numerous places.

As a second test, with the boots laced, the toes should not hit the front of the boot when walking downhill on extremely steep surfaces. The foot should not slip forward significantly nor side to side. There should be room to wiggle the toes. It is normal for the heel to slip a little. Try walking on a steep surface to verify fit. Good outfitters have a ramp for this purpose.

For Scouts who are in the fast growth years, it does not make sense to buy expensive boots which they will outgrow within as little as 6 months. A number of stores such as K-Mart, Target, and Walmart, as well as sporting goods stores carry several brands of inexpensive boots ($25 to $30) which will do fine. Not every brand of boot will fit any particular individual. It is a matter of try and see. Many of the inexpensive boot brands seem to be gone the next time you need new boots and another has taken its place, so a brand recommendation is not easy.

Boot Care

Boots for backpacking and hiking should be waterproof. Even a heavy morning dew will quickly soak through a non waterproof boot. When referring to boots, “waterproof” means that water will only very slowly seep into the boot. There are two ways to achieve this. One is to have an all leather boot and treat it with something like Camp Dry or Nikwax. The second is to have a leather or leather and fabric boot with an inner liner of something waterproof. GoreTex is used in a number of expensive boots, and provides waterproof and breathability. It is the opinion of many experienced long distance hikers that any liner like GoreTex will wear through and leak long before the useful life of the boot is over. A fabric and leather boot without a waterproof layer will be the least waterproof but will be helped by several applications of a waterproofing product over a period of weeks.

If your boots have removable footbeds, take them out at the end of a day of hiking so they will dry faster. You can even store them vertically inside the boots until your next hike.

Boot Break-in

Whichever boot you choose, it should be well broken in before any long hiking or backpacking trip. To not do so will almost certainly result in serious foot problems. Many experts suggest putting 50 miles on a pair of boots before relying on them for long hikes. After buying new boots, wear them around the house or to school. Walk up and down steep hills. Hike over big Kennesaw Mountain, across Little Kennesaw, Pigeon Hill and back by the woods trail. This 5 mile distance is a good test for boot fit. If there are and problems, figure out how to correct them.

Blisters & Foot Problems

When hiking, the first sign of a foot problem will be a burning sensation where the skin is being rubbed. At the first sign of this is the time to take action. If it is being caused by excessive boot slip, tightening the laces may help. Even if you think retying the boot will help, it is probably a good idea to cover the area with tape to stop the irritation. Moleskin is generally regarded as the thing to use for foot problems. A hole can be cut through moleskin to surround and pad around a blister. Another piece can be put over top of this to cover the sensitive blister itself.

If you have caught the problem well before a blister forms, a piece of tape over the area will stop the rubbing. Some hikers like duct tape because of its strong sticking ability and its smooth backing.

If, in spite of fitting boots correctly, you are finding that your toes are rubbing on steep downhill trails, you can reduce this somewhat by tying the boots differently. To stop the foot from slipping forward, the bottom part of the laces needs to be tied tighter. It can be very uncomfortable to have the tops of the boots tightened too much, so a special way of tying is used. Pull the laces tight below the open eyelets. Start a knot here but loop it one more time, similar to the start of a surgeon's knot. Without tying the rest of the knot, begin to lace up the top eyelets as you normally would and finish with the usual knot.

Some hikers have frequent problems with the knot at the top of their boots coming untied. There is a better way to tie boot laces than the most common way. Try tying a square knot. To do this start the knot as usual. Then make a loop out of each loose end and tie them just as you would a square knot, in the reverse way of the first knot. Next find the end of each loop that goes to the knot and not the loose end and pull these very hard. This knot will untie easily when a loose end is pulled but is not likely to come out because it has the holding qualities of a square knot.

Packs for Hiking

For day hikes, almost any type of pack will work, such as the type commonly used for carrying school books. It should be large enough to carry food water, rain gear, and the other items mentioned in the section on what to carry. Since the typical school pack may not be very waterproof, it is a good idea to have a few large zip lock bags to ensure spare socks and such can be kept dry.

It is very desirable to have a water bottle that you can get to without having to stop and take off your pack. A day pack with a water bottle holder on a waist belt or a water bottle holder that you can hang on your belt is a good idea.

One of the hydration systems that consists of a plastic bladder and drinking tube is very useful. These encourage drinking enough water.

Food, Snacks, Water

The body needs a constant intake of high energy food to sustain it during strenuous hikes. Many hikers find it best to eat continuously during the day rather than having a large lunch. Foods such as peanut butter crackers, dried meat, fruit, and trail mix are best. They can be eaten while you walk. Even when eating on the move, it can be pleasant to have a mid-day break to relax, eat, and drink water.

It is important to drink enough water during a hike. Assuming you start well hydrated, and will have access to water at the end of the hike, two quarts may be enough for a 6 to 8 hour hike.

It is best to figure out how much food and water a hike will take and to eat and drink it at a rate to make it last the hike. If you carry it in the pack and wait for some obvious sign that you need it, it might be too late! You will begin to feel tired, weak, and generally not like hiking, but the specific signal of hunger of thirst might not be recognizable. To avoid this, eat and drink throughout the hike and allow time for your body to process the food and water and make the energy available for your use.

Safe Water

No water found in the backcountry should be considered safe to drink without purification. Water should be filtered with a water purifier, treated with Iodine tablets, or boiled.

Clothing, Rain Gear

The best clothing for hiking is made from light weight, synthetic, wicking fabric. Cotton should not be worn at all. It will hold four to five times its weight of water and will take forever to dry. Cotton clothing can be a major factor in hypothermia. Shirts should be made of polypropylene or Capilene, Coolmax and Thermax are examples of modern fabrics which wick water away from the skin and allow it to evaporate quickly. Light weight, loose fitting nylon shorts or pants are best. Such clothing is sold by sporting goods stores and catalogues, but you probably have some suitable clothing, already.

The absolute worst clothing would be a cotton sweatshirt and tight jeans. While this would not be a big problem in ideal weather, if you were to get wet from sweat or rain, the sweatshirt would never dry, would become heavy, and could make you cold. The jeans, whether wet or dry, would bind against your skin and resist your every step, contributing to fatigue.

For colder weather, you should layer clothes. This gives maximum flexibility in selection of weights to meet the current conditions. The same short sleeve shirt you wear in the summer might become the bottom layer with a long sleeve shirt of the same weight and kind over it. If more warmth is needed, add a fleece jacket. In even colder weather a second, possibly heavier, fleece can be added. Polypropylene long underwear can be worn under long or short pants.

Because so much heat is generated by hiking, you will find that you need far less clothing while you are moving. Extra layers should be handy to put on when you stop.

Rain presents special problems. To start with, you should have a waterproof hat to keep rain out of your face. A hat with a wide brim will keep the rain from going down your neck as well. It depends on the type of hike and the temperature what else is needed. On a hot day, while climbing hard, it is probably best to just let the rain soak your clothes. Synthetic clothes will dry quickly from body heat if it stops raining. It is necessary to have a rain jacket for when you stop heavy hiking or if cold rain falls from high thunderheads. To wear this during hard exercise will just result in you being soaked by salt water instead of clean, cool water.

In cool weather, a pair of waterproof rain pants is a good safety measure. These can also be used to increase warmth in cold windy weather.

A rain suit consisting of a jacket and pants which each stuff into a pocket can be bought for about $30 for each piece. The two together will weigh just a little over a pound and be the size of one third of a loaf of bread. Lined jackets, or heavy, rubberized rain gear such as you might have for school wear are not suitable because of the bulk and weight.

A poncho can also be used for protection from rain. It has the disadvantage of being bulkier than a rain suit and will catch on branches and brush. It will also blow in strong wind and not provide complete protection. A poncho for hiking should be made out of something more durable than thin plastic. For backpacking, a poncho made to cover both you and a large pack is needed.

Items to Carry

In addition to the things mentioned above, is a list of essential items which should be taken on a hike or backpacking trip:

Map	Compass	Water	Extra Food	Fire Starter
Matches	First Aid Kit	Knife	Flashlight	Rain Gear
Extra Clothing				

These items are related to safety. Some can be shared among the group, but more than one person should carry each of the items. There are other items which can be very helpful to have:

Insect Repellent	Sunscreen	Sunglasses
Bandanna	Hiking Stick	Camera
Binoculars	Field Guidebook	Notebook & Pencil

See Appendix B for complete gear lists.

How to Hike

Estimating Time

Take into account distance and the difficulty of the terrain when planning a hike. A good average hiking speed is two miles per hour on relatively level terrain. For each 1,000 feet of elevation gain, allow an extra hour. For perspective, the altitude gain between the Kennesaw Mountain visitor center and summit is about 700 feet. For a hike of 5 miles with an elevation gain of 1000 feet, the required walking time would be 5 miles/2 miles per hour + 1 hour for 1000 feet climb or 3.5 hours. This does not count rest stops, enjoying a scenic area or stopping for lunch.

Appendix E contains a chart that shows the difficulty of a hike relative to its length and elevation gain.

It is tempting to assume that the time you lose resting or walking very slowly up steep hills can be made up by great speed on the downhill. This is not so! Consider a hike of 4 miles where the first two miles climb 1000 feet and the second 2 miles descend 1000 feet. If you could maintain an average of 2 miles per hour, it would take 2 hours. If you average 1 mile per hour up hill and took two 15 minute breaks, it would take 2.5 hours for the first two miles alone! Obviously, no amount of speed on the second 2 miles would allow you to achieve the 2 mph average. If your climbing was less than 1 mph, it would take even longer.

Setting the Pace

The best way to handle climbing is to find the speed that you can sustain continuously, or at least for long periods of time, and hike at this rate. By eating and drinking water as you do this, you will achieve your greatest hiking efficiency and will greatly outpace someone using an approach of fast bursts of walking and frequent rests.

With a group of hikers of different abilities, it is best to break into two or more groups with a plan for the forward group to stop and wait at a specific point such as the top of a hill. When the slower group meets the faster, they should rest before continuing. The worst approach is for the faster group to wait for the slower group to catch up and then both groups continue. This allows the faster group to rest and gain advantage over the slower group which becomes increasingly more tired and demoralized. Surprisingly enough, without leader intervention, this is exactly what will happen.

On a hike or backpacking trip, there should be a person at *point* who will control the pace of the leading group. A *sweep* at the end will tend to anyone who falls behind or has problems. This should be a Scout leader. No hiker should pass the point or fall behind the sweep.

Keeping the Distance

When hiking, maintain a distance of at least 6 to 10 feet between you and the person in front. This prevents stepped on heels and slaps with bent back branches and brush. It also allows the person in front to change pace or slow to look at something without causing a collision.

Part II - Basic Backpacking Skills

Backpacks

Aside from boots, nothing affects your comfort and ability to hike more than your backpack. The purpose of the backpack is to contain everything you need for days at a time and allow you to carry it comfortably.

Modern backpacks are equipped with contoured, padded hip belts which allow most of the weight of the pack and its contents to be transferred to your hips rather than your shoulders. The shoulder straps are well padded and carry some of the weight as well as keep the pack close to your body. There is also a load lift strap which attaches to the front of the shoulder strap and runs to the pack above the shoulders. This can be adjusted to control the weight transfer. Hip stabilizer straps run from the hip belt to the pack sides and help keep the pack from swaying side to side.

With this complexity, it is important to get a pack which can be adjusted to fit and to know how to adjust it in the field to relieve problems. This will be covered later.

Packs have evolved a lot over the years. The first packs were rucksacks with a drawstring top and two shoulder straps. These had the disadvantage of putting all of the weight on the shoulders which can quickly become painful. In addition, anything hard in the pack can punch into your back.

The next step in evolution was the pack frame. The first ones were a rectangular frame of wood with crosswise bands to rest on the back and shoulder straps. This allowed a lumpy pack and other items to be lashed on to the fame while your back rested against a smooth back band which also provided some ventilation. Later pack frames were made of aluminum. A simple waist strap helped keep the frame from moving around a lot.

External Frame Packs

The next step was to have a tubular metal frame built as part of the pack, itself. This is known as an external frame pack. The first ones had a flat frame and, like their predecessors, tended to hold your torso rigid to the frame. More evolution resulted in curved frames which are more contoured to the body. The waist belt developed into a highly effective part of the pack. External frame packs usually have four or five external pockets to help organize gear. Most have two main sections. The lower section often has a zippered panel opening. The larger top section may be another panel or a drawstring top with a covering flap. In the latter case, the top of the pack is often several inches longer than the frame allowing the load to expand upward and still be covered by the flap. For this reason, the volume of such a pack is given as a pair of numbers which represent the volume in cubic inches. The frame of an external frame pack usually extends about six inches below the pack. This allows the sleeping bag, tent, or other items to

be lashed on crosswise. Many packs allow things to be lashed on at the top of the pack as well.

Internal Frame Packs

Starting in about the middle of the external frame evolution, the internal frame pack was introduced. This pack is not fitted to a tubular frame but has a stiffener running vertically up the heavily padded back. This stiffener can be bent to fit the wearer's back. Often there are insertable stays that help keep the sides supported. Whereas the external frame pack is wider and flatter, the internal frame is shaped more like a slightly flattened tube. Most internal frame packs have few if any outside pockets. Most everything is stuffed into the pack. There are usually rings which can be used to lash on some items and some packs have straps which allow attachment of external pockets of various sizes.

Choosing a Pack

With two such different approaches, one must be better than the other. At the two extremes, you could say that the E-frame keeps the sweaty pack off your back but is bulkier and harder to bushwhack or rock climb while wearing. The I-frame puts a sizable part of the packs back against your back. It may not distribute the weight as well as a rigid frame does either, but that frame isn't there to get caught on brush and rocks. As mentioned earlier, E-frame packs usually have more organization features and allow lashing on of gear better. The best E-frame packs are considerably less expensive than the best I-frames. Also, a moderately priced ($80-$130) E-frame can be a very good pack. It may take an expensive ($250++) I-frame to match it.

No pack is absolutely waterproof and, because you are depending on what is in the pack, you should have a pack cover that is designed to fit the pack. A heavy plastic garbage bag will substitute for a short time but will not hold up on an extended trip.

Fitting a Pack

In order to carry the weight properly, a pack must fit. The distance between the shoulder strap attach point and the waist belt must match your size so that the belt and straps can work together as they are designed. On E-frame packs, this is changed by telescoping sides of the frame or spacers which control strap attachment. On an I-frame pack there are usually multiple attach points for the straps. It is desirable to find a pack that can be made to work well now and expand to fit when the Scout has grown. For a small Scout, an adult sized pack, however adjustable, may not work because the padded part of the hip belt is too long and would overlap.

The best way to get a good fit on a pack is to go to an outfitter and ask who on the staff is highly experienced at fitting packs and work with them. They usually have sacks of sand or beans that will simulate weight and will let you wander around the store for a long time. The extra cost over that of

a catalog business is a small price to pay for the service of helping find the right pack.

Sleeping Bags, Pads

As with packs, there are choices in types of sleeping bags. There are three criteria:

- Mummy or rectangular
- Synthetic or down fill
- Temperature rating

Since weight is so important, unless you can't stand the tighter fit of the mummy bag, it is the obvious choice for backpacking. Most gear stores will let you try one on in the store.

While weight is important, the significantly lighter down fill completely loses its insulating qualities when wet. It also takes a long time to dry. Look for a light synthetic bag.

The lower temperature range of a sleeping bag may be measured by fluffing up the top layer and laying it on the floor with a yard stick lying across it. Next push another ruler down to the floor and measure the distance between the compressed bag and the horizontal ruler. Call this *T*. The temperature rating is given by: 100 - (40 x T). For T of 2", the rating would be 100 - (40 x 2) = 20°.

A bag with a 20° rating is a good choice for three season camping and backpacking in the Southeast. In the summer, using a light fleece sleeping bag, blanket or an army poncho liner saves a lot of weight.

If one of the inexpensive rectangular bags is to be used, it absolutely must have a stuff sack to allow it to be strapped on to the frame of an external frame pack.

Care of Sleeping Bags

It is important to take good care of your sleeping bag. The insulating rating of a sleeping bag is derived from the thickness of its wall after fluffing it up. The ability of the filling to fluff up and occupy more space is lost from long periods of being stuffed in a stuff sack. Keep your sleeping bag in a large cloth bag when not in use. Many sleeping bags come with these.

Sleeping bags should be washed in front loading washers like the ones at a commercial laundry. Sleeping bags have cloth baffles inside to keep the filling evenly distributed. The agitator in the average home washer pulls too hard on these due to the heavy weight of the water logged filler. Wash the bag only as often as you must. Many through-hikers complete the 2,160 mile Appalachian Trail without washing their sleeping bag. After each camping trip, air it out a day or two before putting it in the storage sack.

Sleeping Pads

Sleeping pads are an important part of the sleeping gear. While it is possible to sleep without one, having something between you and the lumpy ground makes a big difference. In the winter, a pad serves another important function. Remember that the insulating capability of the sleeping bag is related to the thickness of it. The part of the bag against the ground is squashed to about a half inch and provides very little insulation. The sleeping pad, being air inflated or denser foam, makes a big difference.

The most comfortable sleeping pad is an inch or more thick, foam filled, self inflating with a valve to keep the air in. Most of these tend to be expensive, heavy and bulky. The Thermarest is smaller and lighter than most but is expensive. These require care to avoid puncturing them.

A lighter and less expensive alternative is the closed cell foam pad. These are light weight, provide reasonable padding and insulation. One model, the Ridge Rest Z-rest, fan folds into an 11.5 ounce, 5”x4”x20” size for the three quarter length model. It is much easier than one that you have to roll up and try to get to lie flat.

Tents And Tarps

The Tarp Alternative

It is not even necessary to use a tent while backpacking. A properly strung tarp can keep you dry and closer in touch with nature. You can make a shelter for one person with a bottom, side, and top with some tent stakes and a rope. Alternately two large tarps can be used, one for a ground cloth and the second for a cover which will sleep several people. When using a tarp for shelter, keep it as low as possible and take into account the direction of the prevailing wind. One drawback of tarp use is that it is often hard to find an area with enough trees in the right places and space between. Hilltop camping with tarps can be a big problem in a windy storm.

A highly waterproof shelter can be made from a tarp pitched over a rope with both edges folded under to make the bottom. One of the edges should overlay the other and lay part way up the side. The end most exposed to weather can be folded in and tied. Try this at home first! Cheap “tube tents” made of heavy plastic are available.

Tents

The weight of a multi-person tent can be divided among those sharing it. As a guideline, a one person backpacking tent weighs about 2.5 to 3 pounds. A two person backpacking tent weights about 4.5 pounds. An inexpensive two person dome tent might hold 3 small boys and weigh 6 pounds or 2 pounds per boy or two boys at 3 pounds per boy. Tents don't divide into equal weight parts, of course, but other shared equipment can even out the total load.

Whether you have an expensive tent or make a shelter, you can get completely soaked in a heavy storm if it is not set up correctly.

One vulnerability of some cheaper tents is that they may not have a flap that covers the door zipper, or a rain fly that shields it. The best way to use such a tent is to rig a small tarp to cover the top.

After returning from a trip, air out the tent before storing it. Even a little moisture in the tent can lead to bad smelling mildew.

Seam Sealing a Tent

In order for a tent to be waterproof in a heavy storm, its seams must be sealed. Some of the more expensive tents have their seams sealed at the factory. The best ones have a seam tape on the underside. If you get a tent which does not already have the seams sealed, you must seal them. Small and light tents often have a fabric bottom with a seam at the ground line. It is critical that this be sealed. A sealer with a syringe to get the sealer into the seam works best. This takes an hour or two and must be done with good ventilation, preferably outdoors.

Staying Dry

Staying dry in a tent can be a challenge even with no rain. As the outside temperature drops in the night, the air in the tent, moist from your breath, will begin to condense on the tent walls. It is often enough to run down on the floor and to wet the surface of your sleeping bag if you brush against it. This is normally not enough water to be a problem. On a dry morning, spread your sleeping bag over a bush in the sun to thoroughly dry. To help prevent this problem, you can leave the door and window partially unzipped. Be alert for the sounds of rain.

The amount of ventilation a tent provides varies with its construction. Some dome tents have no rain fly and are solid, waterproof material all over. Another approach is to make the top out of a mesh and have a rain fly that covers it. The most highly ventilated tents are mesh down to 8 inches above the ground and have a large rain fly that comes almost to the ground and is supported 4 to 6 inches away from the tent body mesh by the poles. Most condensation runs down the inside of the rain fly and drips harmlessly to the ground.

When it is raining, you must take care that the tent is set up in an area that will not form puddles. It helps to put a little leaf litter under the ground cloth around the uphill side of the tent. This helps ground water go under it and stay away from the floor seam.

When you wake up periodically during the night, check the situation. If water is collecting somewhere in the tent, mop it up with a towel. If you can open the door without letting in water, squeeze the towel out. If the problem is more serious, take a heavy duty leaf bag and pull it over the bottom half of your sleeping bag and adjust your position to avoid most of the water. Keeping your sleeping bag dry must be your highest priority.

Backpacking Stoves

Leave No Trace ethics dictate the use of backpacking stoves. They are faster, easier, and cleaner than cooking over an open fire. There are two

basic types available, ones which burn liquid fuel, and ones which use a propane / butane gas mixture from a small canister.

Inexpensive alternatives are sterno and fuel tab stoves which produce less heat and provide less control of heat.

Liquid Fuel Stoves

The liquid fuel stoves require priming and a warm-up period before they start to generate and frequently flare up. The main reason to choose one of these would be for use on long term backpacking trips where the re-supply of gas canisters would be uncertain. BSA policy is discouraging the use of liquid fuel.

Compressed Gas Stoves

The compressed gas stoves are made by several different manufacturers (Gaz, Primus, Peak) and have incompatible fittings on the canister so choose a brand for which you have a convenient local source of gas canisters. The gas mixture is mostly butane with 20% or 30% propane to raise the pressure during cold weather. These stoves do not perform well below 20° unless you get the canister warm. The canister is rather lightweight metal due to the relatively low pressure. These stoves should not be confused with larger, heavy ones which screw on to the top of propane bottles. These are much too heavy for backpacking.

The stove is a small burner with built-in supports for the pot and screws directly to the top of the canister. Some have a push button ignitor which makes lighting them very quick. This is important because you can turn the stove on and off to conserve gas during various phases of cooking or reheating. Another advantage of these stoves is that you can turn them down to a barely perceptible flame to simmer. None of the liquid fuel stoves do this very well and some burn only at full throttle all the time and sound like a jet engine.

Stove Safety

If traveling by air, be aware that you can not take the gas canisters or any liquid fuel bottle or stove that has *ever* had fuel in it, according to airline regulations. You should never use a backpacking stove (or any other) in a tent. In bad weather, pitch a tarp to provide shelter for cooking. Do not operate a stove in the way of your escape path when under the shelter of a tarp.

Trail Food

For backpacking, food is fuel. It is important that you get enough to sustain the tremendous exertion you undergo. It is important to get enough carbohydrates and proteins. Even fats are no problem during such strenuous endeavors. For trips of a few days or a week, variety is not so important.

Weight and the lack of refrigeration are major factors. Ease of preparation is important too. You may be very tired and weather

conditions may be harsh. This is no time to do something complex. These criteria are easily met by carrying freeze-dried or dehydrated food.

For dinners it is most convenient to have something that can be cooked all at once in one pot. A rice and beans mix or Ramen noodles can be prepared and dried meat added. Also possible are chicken or tuna in cans. These are heavier due to the liquid they contain as well as the can. You will have to carry the can after it is empty. In making a one pot dinner, it should produce just the right amount so that you or the group sharing it can eat all of it. That way there is no food to dispose of that will attract animals. Twice the suggested serving size of the base ingredient is about the right amount when making a one pot dinner.

Breakfast can consist of oatmeal and/or breakfast bars. Other dense (smaller storage requirements) cereal is viable and powered milk can be used with it, and with oatmeal as well.

One approach to lunch is to snack all day on various things. Peanut butter crackers contain protein, carbohydrates, and fats. Dried fruits, such as apple slices, go well with them. Trail mix is good as a snack and high sugar granola bars or special energy bars are almost unbelievable when you face a 1,000 foot climb.

Packing the Pack

After collecting the food and all necessary equipment, it is time to pack. Weight is of real concern here. A general rule is that you should not carry more than $^1/_4$ to $^1/_3$ of your body weight. Some individuals can carry much more, while others are already carrying too much body weight. The best approach is to understand what you really need and not to take extra things. Choosing lighter equipment is important, but the very lightest equipment can be prohibitively expensive.

In packing a pack you need to consider organization and weight distribution. Except on very rugged trails, it is best to put most of their weight high and close to your back. So that says that the sleeping bag, which is light for its size should go in the bottom of an I-frame or lashed on to the bottom of an E-frame pack.

There are certain items that you will need on the trail such as water, snacks, rain gear, first aid kit, etc. These should be in outside pockets or just under the lid of the pack. For an I-frame pack, stuff sacks of various sizes and colors can help in locating things. It is a good idea to have a specific place for everything so that you can find things in a hurry. A packing list showing the name of an item, its weight, and the location in the pack is a good help in ensuring that you bring everything you intend to and that the weight is not excessive. See Appendix A for an example of my list.

Putting on the Pack

While it might seem obvious, there is a correct way to put on the pack and adjust it. It looks very macho to jerk the pack off the ground to a knee, slip is one arm, and whirl around while inserting the other arm, this is a good way to injure yourself and a waste of energy. On a backpacking trip

you want a simple, less strenuous method. In fact, when someone is tired, someone else can help by lifting the pack to the required height.

If an elevated surface such as a pickup bed, bench, log, rock, or hillside is available, use this to rest the bottom of the pack on. If you are in a flat area with nothing to sit on, sit on the ground with your back to the pack.

- First put your watch arm through its strap. If you don't it will get caught.
- Next put the other arm through its strap.
- Next use your shoulders to pull the straps fully onto your shoulders.
- Stand up. If you started flat on the ground, this may be a challenge. Spreading the legs frog-like and coming to you knees will work in that case.
- Next buckle the waist belt and adjust its tension. An upward shrug of the shoulders will get the waist belt up where it belongs. The hip stabilizer straps can be adjusted at this point, if needed.
- Finally buckle, the sternum strap which crosses the chest between the shoulder straps.

Removing the pack is done in the reverse order: sternum, waist, shoulder.

How to Hike

Backpacking differs from hiking mainly in that you are carrying a heavy load and will not return as soon. You have to be more prepared to handle the unexpected. A problem that would make a short hike unpleasant could be a major problem on a backpacking trip.

You should start out at a moderate pace, slowing on steep hills to a speed that you can sustain, but not stopping frequently. Pay attention to the pack and how you are carrying the weight. Does it hurt one shoulder and not the other? Are the shoulder straps adjusted the same? Is one twisted?

You will tire more quickly backpacking than while hiking. There are some things you can do that will help. There is a so called *rest step*, where as you pivot your weight onto the uphill leg, fully straighten it and slow or stop on this leg leaving all of your weight on the locked leg. This gives both sets of leg muscles a brief moment to relax. Repeat with the next leg. This will keep you going and provide some relief. Do not switch into this mode with someone right behind you!

Most of the time when we walk, we step up on our feet to give more spring to the stride. Try walking up a steep hill flat footed, without bending you ankles. This will rest some muscles and with short steps, you will not be putting extra burden on your leg muscles.

Well, you finally reached the top of the mountain and it is downhill for a mile! Be careful here. Walking really fast and taking large steps down puts tremendous forces on your knees each time your weight comes down

on a step. Cartilage in the knee and other joints can really take a beating. Pay attention to how your knees feel and take it easy.

Setting Up Camp

One of the great freedoms of backpacking is that you can stay almost anywhere that you can find water and a flat enough area to sleep. In choosing a campsite, you should avoid fragile areas such as those covered by moss or lichen. Pick a more durable surface such as grass or bare dirt. Until it starts showing signs of wear, a dense ground cover of pine needles is an excellent surface. It handles rain well. Often the flattest and most available camp sites are bare dirt. Be sure to avoid the areas of deep ash around fire pits. You and your equipment can get extremely dirty in these areas.

Keep in mind that when you leave the camp, it should look as if you have not been there. Do not dig, modify the area, or build structures. Scatter anything you have gathered.

When setting up a tent, you need to find a nearly flat place. Most people prefer the head end of the tent to be higher than the feet. Be sure to get the tent lined up with the slope. A side or diagonal slope makes comfortable rest very difficult. Wind or storm conditions may take precedence over slope direction for orientation of the tent. Beware of an extremely flat place; it may become a shallow lake in a heavy rain. A sloping, dished out area may be a stream bed in heavy rain. Try to visualize where water will run in a rain. Before setting up the tent, look around and up. Are there dead trees or large dead branches that could fall in a wind?

While around camp, stay in the hardened, bare area and do not concentrate activity in adjacent areas that are not yet impacted. To do so would increase the size of the impacted area.

Animal Danger

In some backcountry areas, the danger of animals attracted by food or food smells is high. The animal, may be a nuisance that will keep you awake at night, or damage equipment, or it may threaten you.

The best way to avoid these problems is to cook away from your tent, and hang all of the food, snacks, and garbage in a “bear” bag in a tree. It is really important to not let a bear get food from you because it will only make him more bold and eventually he will have to be destroyed. Such a bear becomes an increasing threat to users of the backcountry.

Rigging a Bear Bag

The best way to rig a bear bag is to put the food, which is in zip lock bags, into a nylon stuff sack. Find a tree away from camp, with a horizontal branch about 20 feet off the ground and throw a line over the branch. Hoist the bag to the branch and tie a counter weight (rock or another bag of food) to the free end of the line as high up as you can reach. Roll and secure the extra line to the weight so that it will not hang down. With a hiking stick push the counter weight up as high as possible. Now, the food will be out of the reach of a bear (and you too!).

To get it back, use a hiking stick with a short rope tied to it to slap and wrap around the line and pull it to reach. The line used should be thin to make it hard for small animals to crawl down. The bag should hang well below the limb and out from the trunk. In some developed backcountry areas, steel cables have been run, or poles installed to hang food on.

Instead of the counterweight, you could tie the rope off to the tree which would be easier, but there have been rare cases of a bear clawing a rope until the bag fell. Since there are often multiple bags to hang, the counterweight idea is convenient. The greatest problem is that it can be hard to find a suitable tree to hang bags from or that trees are so dense it is hard to get the bag away from trees and limbs which will assist a bandit in stealing your food.

Cooking and Cleanup

Practicing Leave No Trace techniques is very important in cooking and cleaning. The foremost rule is do not bring food that creates grease or results in pots and dishes that are hard to clean. This is where less is better. Use a 6" bowl, spoon and cup. A fork is not necessary and only serves to puncture the plastic bag used to carry it. If you manage to cook something so tough that you need to cut it, use your pocket knife. When cooking, being careful not to spill over the side of the pot or burn food to the bottom results in easier cleanup. A stove that simmers well is a great help in preventing burned on food.

The one pot meal is a good start for an easy, LNT cleanup. After serving the food into individual bowls, someone is selected to clean the pot immediately. If the pot gets cold, its contents are considered garbage. Right now, it is food. Using a small plastic scraper made for the purpose, scrape the sides and bottom of the pot and eat what collects on the scraper. You can get the pot so clean that you can hardly tell it was used. Then start to eat from your bowl, which is probably still too hot. If you want to make tea or hot chocolate to go with dinner, you can boil the water in the unwashed pot.

The pot and any utensils, bowls and cups that have had food on them must be washed. Bacteria can multiply even on seemingly clean surfaces. The backcountry is no place to find this out the hard way. Cleanup is very critical in today's heavily used camping areas. Please be meticulous with your procedures. It really does not take any longer. It will leave the place nicer for the next person and reduces the chance that animals will bother your camp.

Boil water in the pot. Put one or two drops of Campsuds, or other biodegradable soap in each bowl or cup and add boiling water. Use a small ($1\ ^1/_2$" x 2") scrub pad and wash the entire inside and rim. Do not use a Brillo pad or any other scrub pad that contains soap. Such a pad releases way too much soap to be disposed of in the backcountry. Swish the scrubbing pad around in the hot water with a spoon.

When through, consolidate the water in one container and take it about 200 feet from camp in some randomly chosen, lightly traveled area, and sling the water from the pot so as to scatter it over a wide area. Do this safely! If water is plentiful, a final rinse is good. This water can be discarded closer to camp.

Medical Issues

Backpacking is very strenuous and you are subject to greatly varied weather conditions. It is very important to understand how to prevent problems and recognize their symptoms, should they occur. Read chapter 11, in *The Boy Scout Handbook* and understand the symptoms, treatment, and especially prevention of:

Dehydration	Heat Exhaustion	Heatstroke	Hypothermia
Frostbite	Hyperventilation	Sunburn	Blisters
Insect Stings	Tick Bite	Snake Bite	Sprain

Backpacking Training

Most long distance backpackers agree that being mentally prepared for backpacking is as important or more important than the physical training. Learning to ignore what is bothering you and focus on the end goal plays a large part in their ability to cover 15 to 20 miles in a single day on rough terrain. Starting the day with the thought that you will hike for a certain number of hours instead of focusing on each hill as an obstacle, makes the hike easier.

There is no better way to train for backpacking than getting out and doing it. Taking walks in a hilly area with your loaded pack will condition you for carrying more weight and will let you evaluate the fit of the pack and your ability to carry the weight. Start with less than a full load and work up to a full pack. This will allow your strength and pack weight to adjust to compatible levels. Other good forms of exercise are stair climbing bicycling.

Part III - Advanced Backpacking Skills

This section covers skills more commonly needed for longer backpacking trips, although the information is useful for shorter trips as well.

Pack Weight

Aside from having boots that don't hurt your feet, no other factor is as important in backpacking comfort than the weight of the pack. The best way to reduce the weight of the pack is to understand what you carry in the pack and its weight.

This can be done using scales you might have around the house. A postage scale is good for weighing small items. A kitchen scale or baby scale will be best for larger items such as the sleeping bag. Make a list of your equipment and individual weights.

There are two ways to reduce weight: to omit something from the pack altogether or to replace it with something lighter. A common cause of excessive weight is carrying a large number of small items just in case they are needed. If they are not related to staying warm and dry, you probably do not need them. Before a trip, think about each item in your pack and under what conditions it would be used and decide whether it is really needed. Make a similar analysis after each trip. By keeping a list of the equipment you use, over time you can reduce weight and make packing for a trip much easier and faster.

Appendix A contains my list of equipment and its weight. Over a few years, this list has moved towards light equipment. If you have an item that is heavier than one in my list, look for a lighter alternative. Buying the very lightest of everything is expensive. It is best to work on light food, avoiding excess equipment, and finding lighter alternatives that you already have.

Staying Clean

On long backpacking trips, keeping your body clean becomes important. It is not practical to bring a clean set of clothes for each day, nor is it possible to take a shower at the end of the day. In many areas, there are not streams large enough to bathe in. Going many days without washing can lead to painful chaffing or rash.

Fortunately you can do a lot with a little water. Even water from a water bottle on a small wash cloth can clean up your face and arms. Don't forget your feet. They are doing some of the hardest work. Wash the salt from them and use clean sock liners as often as possible.

You should not wash clothes or yourself with soap directly in a stream. You can use a container to carry water away from a stream and wash yourself or clothes with a little soap. Scatter the soapy water over a wide area as described earlier for dish washing water. Obtain and use rinse water in the same way.

Staying Dry and Warm

The highest priority on a backpacking trip is to stay dry and warm or at least to have the means to get dry and warmed up. This is mainly a problem in cool or cold weather. While hiking, it is not hard to stay warm if your clothes are dry. If you must stop to rest, eat, or set up camp, you can become chilled quickly in temperatures as high as the low 50's.

A backpacker should have multiple lines of defense against wet and cold. If the clothes you are wearing get wet and you become cold, you can change to a second set of clothes with rain jacket and rain pants. If these were to fail, you can resort to your sleeping bag in the tent.

Needless to say, keeping the sleeping bag dry under all conditions should be your highest priority. For it to get wet in cold weather can, at best, force the end of a trip at worst, it can endanger your life.

A seam sealed stuff sack under a pack cover should keep the sleeping bag dry. The greatest danger is getting it wet in a leaking tent. Pay particularly close attention to the section on tents for ways to prevent leaking problems. It is a good idea to carry a large heavy duty garbage bag. If you are faced with a serious tent leak, you can protect the bottom part of the sleeping bag by pulling the garbage bag over the lower end of the bag.

Appendix A - Sample Backpacking List

The following is my packing list. It is an Excel spreadsheet which allows me to select a set of backpacking items and see the total pack weight. In addition, it serves as a loading list for the pack. Such an approach is a good way to understand why your pack weighs so much. A postage or kitchen scale is useful for weighing things.

Starting in the left most column is a category heading for a group of items which are sub-totaled. The next column is the name of an item followed by its location in the pack. Next is the weight in pounds and ounces and a quantity. This is usually blank or 1, but in the case of water is the number of ounces. I use a zero in this column to mean that the item is going on the trip but not in my pack. The rightmost columns are the weight of the object multiplied by the quantity.

At the bottom of the list are itemizations of food and a few zipper pouches which form kits. The location codes are as follows:

ext - Lashed on to the pack, externally
top - Main top section of pack
bot - Main bottom section of the pack
TL - Top left pocket (viewed from rear)
off - Pouch on pack strap
TR - Top right pocket
BL - Bottom left pocket
BR - Bottom right pocket
TC - Top center (back) pocket

		Locat	Weight			**Backpacking**		
	Item	ion	lbs	oz			lbs	oz
House								
	Backpack, Kelty Trekker		5	8.00		1	5	8.0
	Pack Cover	ext		6.00		1		6.0
	Rope Bag & pegs	top		12.00		0		
	Arch Rival Tent	ext	4	8.00		1	4	8.0
	Footprint	ext	1	0.00		0		
	Light-weight tarp 8x10	top		15.00		0		
	Sub-Total						**10**	**6.0**
Sleeping								
	Thermoguard	ext	3	6.00				
	Ridge Rest Z Rest	ext		11.50		1		11.5
	Sleeping Bag	ext	4	4.00				
	Slumberjack Pillow	top		7.00		1		7.0
	Poncho Liner	top	1	2.00		1	1	2.0
	Sub-Total						**2**	**4.5**
Accessories								
	First Aid Kit	BR		3.00		1		3.0
	Blue Kit - Snake, Sun, Insect	BR		4.50		1		4.5
	Green Kit - Compass, Whistle	BR		2.00		1		2.0
	Repair Kit	BL		4.50		1		4.5
	Foot Care	TR		3.50		1		3.5
	2 x AA Battery (lithium)	TC		1.00		1		1.0
	Petzl Micro Light	TL		4.50		1		4.5
	Candle Lantern	top		4.50		1		4.5
	Thermometer	TC		0.50		1		0.5
	Radio	top		1.50		1		1.5
	Notepad & Pencil	off		2.00		1		2.0

	Maps	TC		2.00		1		2.0
	Commando Rope	ext		4.00		1		4.0
	Trowel	ext		2.00		1		2.0
	Wash Cloth	bot		0.50		1		0.5
	Pack Towel	bot		1.50		1		1.5
	Swiss Army Knife	BL		3.00		1		3.0
	Camera	TL		11.00		1		11.0
	Binoculars	TL		5.00		1		5.0
	Space Blanket	BL		2.00		1		2.0
	Toiletries	TC		6.00		1		6.0
	Sub-Total						**4**	**4.5**
Food & Water								
	32 oz Water Bottle	WB		5.00		2		10.0
	Water, ounces	WB		1.00		64	4	0.0
	Water Sack, 3 gal.	bot		3.50		1		3.5
	Water Filter	top	1	0.00		1	1	0.0
	Wash Basin	bot		2.75		1		2.8
	Bear Bag/cord	top		5.00		1		5.0
	Snacks	TR		1.00		5		5.0
	Food (from list)	bot	5	14		1	5	14.3
	Food (lbs.)	bot	1					
	Sub-Total						**12**	**8.6**
Kitchen								
	Stove, Gaz	bot		11.00		1		11.0
	Gaz 270 ml	bot		13.00		0		
	Cooking Pot 1.3 l	bot		6.00		1		6.0
	REI Cup	bot		4.00		1		4.0
	Bowl	bot		2.50		1		2.5
	Spoon, Fork, scraper	bot		1.00		1		1.0
	Scrub Pad	BL		0.50		1		0.5
	Campsuds	BL		3.00		1		3.0
	Total						**1**	**12.0**
Clothing								
	Parka	top	1	12.00				
	Rain Jacket	top		10.50		1		10.5
	Rain Pants	top		7.50		1		7.5
	Fleece Jacket 200	top	1	6.00				
	Fleece Jacket 100	top		11.00				
	Poncho	top	1	11.00				
	Short Hiking Pants	top		13.00				
	Nylon Shorts	top		5.50		1		5.5
	Convertible Hiking Pants	top		11.00		1		11.0
	Tee Shirts (ss) (Coolmax)	top		5.50		1		5.5
	Tee Shirts (ls) (Coolmax)	top		7.00		1		7.0
	Underpants (Coolmax)	top		2.00		1		2.0
	Long underwear (bottoms)	top		5.00				
	Hiking Socks	top		3.25		2		6.5
	Liner Socks	top		0.50		2		1.0
	Teva Sandals	bot	1	6.00		1	1	6.0
	Camp Sandals	bot		1.00				
	Bandanna	top		0.75		1		0.8

	Gloves	top		4.00				
	Liner Gloves	top		1.00				
	Head Band	top		1.00		1		1.0
	Stocking Hat	top		1.50				
	Knee Brace	top		4.00		1		4.0
	Other							
	Sub-Total						**5**	**4.3**
Total			**57**	**4.32**			**36**	**7.8**
			Weight			**Backpacking**		
			lbs	oz			lbs	oz
Backpacking Food								
	Lunches	bot		7.33		4	1	13.3
	Dinners	bot		7.00		4	1	12.0
	Breakfasts	bot		6.50		4	1	10.0
	Bread	bot		5.00		1		5.0
	Apples	bot		6.00		1		6.0
	Daily Snacks	bot						
		bot						
	Total Food		**1**	**15.8**			**5**	**14.3**
			Weight			**Backpacking**		
			lbs	oz			lbs	oz
Repair Kit				4.50				
	2" Buckle							
	36" strap							
	Sewing Kit							
	Safety Pins (6)							
	Clevis pins & rings (2)							
	Wire saw							
	Brass wire							
	Tent Patch							
	Duct Tape							
	Tie Wraps (2)							
Blue Kit (Bite and Sting)				4.50				
	Deet							
	Sting Stick							
	Sawyer Extractor							
	Sun Screen							
Green Kit				2.00				
	Whistle							
	Glasses strap							

Appendix B - Equipment Lists

Hiking

The following is a list of items to consider taking on a hike. Underlined items are required by Troop 750.

Waterproofed boots	Water (2 quarts)	Fire starter	First Aid kit
Spare socks	Food/snacks	Matches	Extra clothing
Rain jacket	Hiking stick	Compass	Flashlight
Rain pants	Pocket knife	Map	

Backpacking

The following is a list of items to consider taking on a backpacking trip. Underlined items are required by Troop 750.

Personal Items

Backpack	Pillow	Small towel	Matches
Backpack cover	Personal first aid kit	Personal toiletries	Knife
Sleeping bag with waterproof stuff sack	Flashlight (AA)	Toilet paper	Water
	Spare batteries/bulb	Ziploc bags	Snacks
Sleeping Bag Straps	Pocket knife	Bowl	
Sleeping pad	Compass & map	Spoon	

Clothing

Waterproofed boots	Water repellent hat	2 or 3 T-shirts *	Gaiters
Rain jacket	Hiking socks (3)	Underwear (2) *	
Rain pants	Liner socks (3)	Shorts or pants (2) *	

* - synthetic material

Clothing - Cold

Long underwear (mid-weight, synthetic)	Fleece jacket(s)	Wool or fleece hat	Wool or fleece pants
	Wind pants	Insulated gloves	

Group Items

Tent, poles, stakes, fly	Stove fuel	Bio-degradable soap	Trowel
Ground cloth for tent	Cooking pot	Dish scrubber pad	
Water filter or tablets	Food	Compass	
Backpacking stove	Bear bag and rope	Map	

Optional Items

Hiking stick	Sun glasses	Camera	Chap stick
Sunscreen	Insect repellent	Binoculars	

Other Backpacking Equipment Requirements

- Unless kept in the pack, the sleeping bag must fit into a waterproof stuff sack which is strapped to the backpack frame by flat straps which hold it securely. Not securely attaching the sleeping bag results in endless frustration.
- Any item attached externally to a backpack must be done so securely, preferably using an adjustable, flat strap.
- As an added protection against water, clothing should be packed in zip-lock bags inside the pack.
- No cotton clothing!
- Put your name on all clothing and equipment.

Appendix C - Leave No Trace Principles

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 4-6.
- Repackage food to minimize waste.
- Use a map and compass to eliminate the use of marking paint, rock cairns or flagging.

Travel and Camp on Durable Surfaces

- Durable surfaces include established trails and campsites, rock, gravel, dry grasses or snow.
- Protect riparian areas by camping at least 200 feet from lakes and streams.
- Good campsites are found, not made. Altering a site is not necessary.

In popular areas

- Concentrate use on existing trails and campsites.
- Walk single file in the middle of the trail, even when wet or muddy.
- Keep campsites small. Focus activities in areas where vegetation is absent.

In pristine areas

- Disperse use to prevent the creation of campsites and trails.
- Avoid places where impacts are just beginning.

Dispose of Waste Properly

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

Leave What You Find

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

Minimize Campfire Impacts

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

Respect Wildlife

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

Be Considerate of Other Visitors

- Respect other visitors and protect the quality of their experience.
- Be courteous. Yield to other users on the trail.

- Step to the downhill side of the trail when encountering pack stock.
- Take breaks and camp away from trails and other visitors.
- Let nature's sounds prevail. Avoid loud voices and noises.

Appendix D - Merit Badge Requirements

Hiking

1. Show that you know first aid for injuries or illnesses that could occur while hiking, including hypothermia, heatstroke, heat, exhaustion, frostbite dehydration, sunburn, insect stings, tick bites, snakebite, blisters, and hyperventilation.
2. Explain and show, where possible, the main points of good hiking practices.
3. Make a written plan for a 10-mile hike, including map routes, a clothing and equipment list, and a list of things for a trail lunch.
4. Take five hikes, each on a different day, and each of at least ten continuous miles.
5. Take a hike of 20 continuous miles in 1 day.
6. After each hike, write a short report of your experience. Give dates and descriptions of routes covered, weather, and any interesting things you saw.

Backpacking

1. Show that you know first aid for injuries or illnesses that could occur while backpacking, including hypothermia, heatstroke, heat exhaustion, frostbite, dehydration, sunburn, insect stings, tick bites, snakebite, blisters, and hyperventilation.
2. Do the following:
    a) List 10 items which are essential to be carried on any overnight backpacking trek and explain why each item is necessary.
    b) Describe 10 ways you can limit the weight and bulk to be carried in your pack without jeopardizing your health and safety.
3. Do the following:
    a) Define limits on the number of backpackers that should be on a backpacking crew.
    b) Explain the reason for the upper limit and the lower limit in a backpacking crew.
4. Tell environmental considerations that are important for backpackers and describe five ways to lessen their impact on the environment. Describe proper methods for disposing of solid and liquid wastes.
5. Demonstrate two ways to purify water and tell why water purification is essential.
6. Demonstrate that you can read topographic maps. While on a hike, use a map and compass to establish your position on the terrain at random times and places.
7. Tell how to prepare properly for and deal with inclement weather while on a backpacking trek.
8. Do the following:
    a) Explain the advantages and disadvantages of three different types of backpacking stoves using at least three different types of fuel.
    b) Demonstrate that you know how to operate a backpacking stove safely and to handle liquid fuel safely.
    c) Prepare at least three meals using a stove and fuel you can carry in a backpack.
9. Do the following:
    a) Plan a patrol backpacking hike.
    b) Properly pack your own gear and your share of the crew equipment and food. Protect it against inclement weather. Show that your pack allows you to get quickly to items you may need on the trail and provides for comfort, balance, and neatness. Show how to use effectively a pack frame and hip strap to distribute the weight on your body.
    c) Conduct a prehike inspection of the patrol and its equipment.
    d) Carrying your pack, complete a hike of at least 2 miles.
10. Take three backpacking treks. Each must consist of at least 3 days duration with two different overnight campsites, and each must cover at least 15 miles. Carry everything you will need throughout the trek.

11. Do the following:
    a) In addition, assist in planning and take a backpacking trek of at least 5 days with at least three different campsites, and covering at least 30 miles. Your written plan submitted to your counselor must include route, food and menus, equipment, and emergency notification. Prepare lightweight, reasonably priced trail menus. Carry everything you need throughout the entire trek.
    b) On returning, tell what you did to get in shape for this trek and how you might do it differently again.

BSA Leave No Trace Awareness Award

Boy Scout and Venturer Requirements

1. Recite and explain the principles of Leave No Trace.
2. On three separate camping/backpacking trips demonstrate and practice the principles of Leave No Trace.
3. Earn the Camping and Environmental Science merit badges.
4. Participate in a Leave No Trace-related service project.
5. Give a 10-minute presentation on a Leave No Trace topic approved by your Scoutmaster.
6. Draw a poster or build a model to demonstrate the differences in how we camp or travel in high-use and pristine areas.

Scouter and Advisor Requirements

1. Recite and explain the principles of Leave No Trace.
2. On three separate camping/backpacking trips demonstrate and practice the principles of Leave No Trace.
3. Share with another Scout Leader/Advisor your understanding and knowledge of the Camping and Environmental Science merit badge pamphlets.
4. Actively assist (training, Advice, and general supervision) a Scout/Venturer in planning, organizing, and leading a service project related to Leave No Trace.
5. Assist a minimum of three Scouts/Venturers in earning the Leave No Trace Awareness Award.
6. Plan and conduct a Leave No Trace awareness session for Scouts, Scouters, Advisors, or an interested group outside of Scouting.

Appendix E - Hike Difficulty

The following table, adapted from Hiking & Backpacking by Karen Berger, gives the relative difficulty of various length hikes with various elevation gains.

Hike Difficulty					
	Daily Mileage				
Elevation Gain	5 - 8	8 - 10	11 - 13	14 - 17	Over 17
Less Than 1,000	1	1	2	3	4
1,000 - 2,000	1	2	3	4	4
2,000 - 3,000	3	4	4	5	5
3,000 - 4,000	4	5	5	6	6
More than 5,000	5	5	6	6	6

Legend:

Level 1	Easy break in
Level 2	If your boots are well tested, you can start at this level
Level 3	In good shape, this is relatively easy
Level 4	Good aerobic shape, push a little
Level 5	Serious exerciser, fast pace
Level 6	Marathon runner, long distance hiker, masochist

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