

Backpacking

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Introduction

In no area of Scouting is lightness and compactness more essential than in high-adventure backpacking. You'll probably need to carry everything you'll use during the entire trip, so even ounces are important. The load for each fellow should not be more than 1/3 of his body weight. When group gear is added to personal gear, you'll find serious overweight problems unless careful attention has been paid to the weight and importance of individual items.

The most critical part of your trip may come before you ever take the first step down the trail. Be prepared before you leave. Remember these five simple rules.

1. Get in shape before you leave. Start jogging, lifting weights and preparing at least two months before you go. If you're out of shape you increase the risk of pulling a muscle or injuring yourself in some other way.
2. Learn as much as you can about your destination. Call before you go to get the latest on changing weather conditions that could affect your trip.
3. Check your gear. Write out checklists to make sure you don't forget anything. And make sure that your stove, tent, backpack and other gear are in working order.
4. Take a CPR and First Aid class before you go out into the wilderness.
5. Respect the wilderness. Don't feed animals, pick flowers and leave garbage behind. The wilderness is a resource for everyone to share. Think of the others who will follow you. Remember the Outdoor Code!

Packs

The backpack is simply a backcountry device used to transport all your gear from point A to point B. However, choosing the specific backpack to accomplish this task is not so simple. In fact, it can be down right complicated. You must consider such variables as internal or external framed, load distribution, size, capacity, fit, comfort, durability, and price. Making sure you purchase the right pack will pay off after you've left the roadside and are miles down the trail. The following information might help you when searching for that perfect backpack.

The old adage "You get what you pay for" is especially true with packs. In general, you will find that the better (i.e. quality) pack manufacturers tend to be higher priced because of more features and better technology, designs and materials.

There may not be one pack that will do and be everything you want. By being realistic about what you primarily intend on using the pack for, you can easily narrow down the number of packs to consider. Things to consider include:

- How long do you plan on going out? Day hikes? Overnight? Several days?
- Will you be traveling mostly on or off trails?
- Do you intend to do some skiing, technical climbing, or backcountry traveling?
- What kind and how much equipment and clothing will you need to carry?

Types of Packs

There are three different styles of backpacks: daypacks, external framed packs, and internal framed packs.

Daypacks

For day hikes, kicking around town, and going to class, companies offer what is commonly referred to as daypacks or book bags. Daypacks usually range in size from 500 to 2500 cubic inches. Their intended use is for light loads that are only carried on short distances. A few of the more technical daypacks may have waist belts for those full packs. Daypacks are also very useful to climbers and the waist belt transfers the load of their climbing gear to the waist. These packs are not constructed for trail use and will become very uncomfortable after a very short while.

For daypacks, padded shoulder straps are a must. Consider a padded back, which will keep odd-shaped articles from poking you and help the pack keep its shape.

External Frame Packs

External Frame packs have a tubular metal frame with a pack and a suspension system attached to it. The suspension system consists of a waist belt and shoulder harness. These packs are most effectively used on open, maintained trails where balance is not a critical factor. These packs are not well suited for off trail hiking, skiing, and climbing. External frame packs are easily packed, partly because there is an abundance of room on the outside of the pack to strap sleeping bags, ground pads, tents, or other miscellaneous cargo. These packs are generally larger and will carry much larger/heavier loads than any of the other types of packs.

External frame packs make excellent first time-packs. Since the frame is on the outside of the backpack it helps distribute the weight evenly. The skill of perfect loading is not required; the frame will help balance the load. The rigid frame of an external frame pack keeps the center of gravity higher and allows more weight to be supported by the hip belt and not hanging on your shoulders. This is by far the most efficient and comfortable way of carrying large and heavy loads, especially if you are traveling mostly on trails.

Other advantages to the external frame include the following:

- The pack is held away from the body. This allows air to flow to the carrier's back, thereby making the hike a little cooler; external frame packs are ideal for hiking in desert areas.
- These packs usually have numerous pockets/pouches mounted on the external periphery of the pack itself. This makes for easy accessibility to specific items.
- They tend to be lighter than most internal frame packs. In some cases, the difference can be as much as two to three pounds.
- The new models are highly adjustable allowing a better fit for different builds. These packs are generally much more adjustable than internal frame packs; an important consideration if you are still growing.
- The metal frame is designed so that most of the pack's weight is shifted to the hip-belt and off the shoulders and back. If you are prone to back and shoulder fatigue then this might be the frame type for you.
- An external frame pack costs about half as much as an internal frame pack!

The capacity of an external frame pack can range from 2500 cubic inches to 7000 cubic inches. The external-frame packs large load-carrying capacity is also its biggest shortcoming. It is awkward on anything but a well-defined trail.

Frame materials and shapes can vary, but the proven, most durable, and most efficient frame is still one made primarily of aluminum tubing, not one entirely made of plastic/nylon, fiberglass, or bolted or clamped aluminum tubing.

Disadvantages to the external frame include the following:

- The frame of these packs can be cumbersome in tight squeezes and heavy brush.
- The high center of gravity can throw you off balance during a tricky climbing maneuver. The weight in an external frame pack is loaded high in the pack causing the pack and you to become top heavy. It's also difficult to tilt your head back to look up.
- Skiing is difficult since the frame restricts your arm movements.
- These packs are not good for airline travel, as the frame is certain to be bent when you check it as luggage.

When shopping for an external-frame pack, there are specific things to look for. If you are going for a week you'll want a large capacity pack. The second item of importance is how easy can you adjust the frame to your own particular body characteristics. Look for a pack that has numerous adjustments. Look also at the waist belt and be sure that it is contoured to fit your particular body. Are the shoulder straps fully adjustable? Look for a pack that will carry the bulk of the weight on your hips.

There are several other important elements to look for in a good external frame pack:

1. Well-padded hip belt that will tighten snugly just above the hips. The belt should be tight enough to support the pack on the belt with 25 to 30 pounds inside the pack. The shoulders should not support the pack.
2. Well-padded shoulder straps. The shoulder straps should come horizontal from the frame to the shoulder. The straps are to hold the pack against the back, not carry the load.
3. Straps for sleeping bag and tent should also be bought to securely fasten the bag and tent to the pack. Do not use bungee or elastic cords.
4. A good frame will have welded construction.
5. One suggestion is to buy a pack that fits now and sell it to a smaller Scout when you son outgrows it. A quality pack will lose little value.

If most of your backpacking is on developed trails and you carry gear for four or more days of travel, an external frame backpack will best fit your needs. It places most of the load over your natural center of gravity, allowing you to walk normally and conserve energy while carrying even the heaviest loads.

Internal Frame Packs

The internal frame pack was designed with the extreme user in mind. It fits to the body, following the curvature of the back and bends with the body. The name implies the design. The frame is constructed on the inside of the pack. The frame is usually made from carbon fiber, fiberglass, aluminum stays, or a combination of these. Any of these materials can be formed to fit the back, to offer a close and comfortable fit. It is best to get the dealer of the pack to custom-fit the frame to the buyer's body as this involves bending of the stays. The stays transfer the load of the pack to the harness system, which places the weight onto the waist. Internal frames offer better balance by giving the user a lower profile, which can not be achieved with an external pack. When choosing an internal frame pack be extremely careful in selecting your size; internals are not as forgiving as the externals are.

Other advantages to the internal frame include the following:

- These packs are great for people who carry loads while doing activities that require independent arm movement.
- These packs are also excellent for trips that involve climbing, skiing, or hiking across rough trails.
- Internal frame packs are generally more comfortable for lighter loads.
- There are fewer protrusions to catch of rocks, thick brush, etc.
- If you plan on doing any traveling by air with your pack, an internal frame is less likely to be damaged in transit.
- Internal frames have a lower center of gravity thereby allowing the wearer to do activities that require delicate, balanced movement.

The capacity of internal packs generally run the same as the external frames run, 2500 to 7000 cubic inches. However, because the sleeping bag is most often carried on the inside of the pack, the external frame pack, per cubic inch, can carry a greater load than the same capacity internal frame pack.

Disadvantages to the internal frame include the following:

- Learning how to properly balance the load when packing is critical. Since internal frame packs are attached directly to the wearer an unbalanced load can cause problems.
- Since the pack fits against the body, it is naturally hotter in the summer.
- Most internal frames have few external pockets, this means you may have to dig a little to find gear.
- You have to fit almost everything inside this pack; you do not have the latitude to attach many items to the outside.
- The adjustment options of the suspension (shoulder straps, hip belt, compression straps) require more attention to make the pack fit correctly and comfortably.
- Because the fabric of the pack must support its contents, it is made from heavier material, adding to the overall weight of the pack.
- You must be careful how you pack or you could spend the day with a stove, camera or cooking kit digging into your spine.
- Since these packs ride lower on your back, they increase the risk of lower back strain.
- These packs are also a lot more expensive than external frame packs.

When shopping for an internal-frame pack, look for as many adjustment points as possible. Look for compression straps on the side; these allow you to compress the loads significantly and keep the load close to the body. Make sure that you have shoulder and hip stabilizers and a comfortable lumbar and/or posture pad. Added niceties are such things as removable side pouches, sunglass cases, D-rings, key-hooks.

If most of your pack use is for traveling, climbing or ski touring, an internal frame is a good choice. These packs ride close to your back for better balance on difficult terrain. And with no exposed frame parts, they're easier to store in canoes, airplanes or buses.

Features to Consider in a Pack

The following are features to consider when purchasing a backpack:

- Look for a pack with a sternum strap. This strap connects the shoulder straps together near the center of your chest and adds to the adjustability of a pack.
- Check the zippers, seams and belts to make sure they are of quality construction. If they seem cheap move on. The last thing you need is a broken zipper or shoulder belt out in the middle of nowhere. The zippers should be of a type that won't clog easily and will function well even in cold weather.
- Observe the stitching. Good packs will be double-stitched to improve durability as well as strength.
- Can the pack be easily adjusted to improve the fit or shift the weight of the load without taking it off?
- Look for a backpack that is divided up into sections. You don't want to have to open your pack and empty everything out just to get at a map, take a drink or gain access to a snack.
- The fit should be your number one priority. If it doesn't feel right, don't buy it. Put some things in it before you leave the store, if possible, to see how it handles the load. If the store will allow, load the pack you are considering purchasing with sandbags or other objects of weight to simulate a realistic load that you would haul in the backcountry. This will make the decision process a lot easier. Try the loaded pack on, walk around.
- Load lifter straps ease the weight on the shoulders (for internal frame packs).
- Compression straps allow the load size of the pack to be reduced. These can also bring the center of gravity of the pack closer to the back improving stability.
- A long storm collar that extends to almost 12 inches. The storm collar will be used for loading items that do not fit inside the pack.
- Accessory pockets that allow for easy access to certain items.
- Hydration pockets that will accept different sizes of drinking bladders.
- Contoured shoulder straps to improve comfort.
- Cupped or canted hip belts to improve comfort.
- Daisy chain on the front offering multiple lash points.
- Reinforced pack bottom to protect the end that gets abused the most.

Note: Pack seams can be sealed with the same seam sealer that is used on tents; however, since packs have a lot of zippers, water is bound to leak in during heavy rain. It is recommended that everything be packed in waterproof sacks or containers. Also use a waterproof rain cover for your pack.

Pack Capacity

Your length of stay in the backcountry and the season of the year will mostly determine the size and capacity of your backpack. Typically, for a weekend or half-week trip a 4000-5000 cubic inch internal frame or a 3,000 cubic inch external frame will suffice. When going on an extended trip (a week or longer) a 6000+ internal or a 4000+ external will be needed to carry the extra food and gear required for longer excursions. If you're backpacking in the winter add at least 500-1000 cubic inches to both types of packs to accommodate bulkier clothing and a warmer sleeping bag. (Note: The reason why the external pack's capacity is lower than the internal's is because your sleeping bag, tent, sleeping pad, etc. are usually loaded on the inside of an internal pack. The same items can be attached to the frame of an external pack so the actual pack itself need not be as big.)

Recommendations

For new Scouts, we recommend an external frame pack sized for proper fit. Good packs include the following:

- Kelty Yukon Youth Pack; fits torsos of 13 to 19 inches and belt adjusts down to 22 inches. Capacity is 3175 cubic inches.
- Medium CampTrails McKinley; fits torsos of 13 to 21 inches. Capacity is 2880 to 3880 cubic inches.
- Might also try some of the backpacks design for women including the Women's Kelty Trekker and the Women's Kelty Tioga. Women's backpacks are usually designed for shorter torsos and smaller waists. Shoulder straps are narrower. Waist belts may also be flared to fit women's wider hips and lumbar pad may be designed to fit a small of a woman's back.

For a little larger Scouts try these backpacks:

- Kelty Klondike; fits torsos of 16 to 21 inches. Capacity is 3500 cubic inches.
- Men's Kelty Tioga; fits torsos of 14 to 23 inches. Capacity is 3900 to 4485 cubic inches.
- Medium CampTrails Wilderness; fits torsos of 14 to 20 inches. Capacity is 3130 to 4130 cubic inches.

For adults your choices may include the following:

- Men's Kelty Trekker; fits torsos of 14 to 23 inches. Capacity is 3900 to 4485 cubic inches.
- Kelty Super Tioga; fits torsos of 14 to 23 inches. Capacity is 4125 to 4725 cubic inches.
- Large CampTrails Wilderness; fits torsos of 17 to 24 inches. Capacity is 3580 to 4580 cubic inches.
- Large CampTrails McKinley; fits torsos of 15 to 23 inches. Capacity is 3330 to 4330 cubic inches.
- CampTrails Omega; fits torsos of 17 to 24 inches. Capacity is 4980 to 5700 cubic inches.
BIG!!!

Sizing and Fitting Your Pack

After you have decided on the type and capacity of your pack you are ready to concentrate on fit. The first thing you should look at when fitting a pack is torso length, which is more important than simply how tall you are. A 6-foot tall person with long legs and short torso may need the same pack as the 5' 8" person with short legs and long torso. The torso length is determined by measuring the distance from the 7th vertebra (the knob at the base of the neck) to the crest of the hips (approximately where you place both hands on your hips). My 11-year-old son has a torso length of 13 inches; this short torso length limits the pack choices available since few packs are able to adjust down that small.

To make the backpack work like it's supposed to, you must fit the pack to your body. By making the proper adjustments, the pack should put the majority of the weight onto your hips, not your shoulders.

When fitting a pack the place to start is with the hipbelt. The hipbelt is what does the weight transfer. Put the pack on and have the hipbelt on your hips, it's worn a little above the widest point of the hipbones, so it exerts downward and inward pressure, on the hips. The weight should be supported by the hips, not around the waist (this is a point below your actual waistline and above the widest point of your hipbones). Cinch the hipbelt snugly and make sure that you have enough extra room in the belt that you can tighten up at least an inch or two more if you need to. The position of the hipbelt on the frame is adjustable. It's very important to keep the majority of the weight off the shoulders. Hipbelts usually have one sub-component, hipbelt stabilizer straps, one on each side.

The two types of packs, Internals and Externals, are adjusted differently.

Fitting External Frame Packs

With the hipbelt on and properly positioned, tighten the shoulder straps and note their position. The shoulder straps should be adjusted to a 45-degree angle, from the tops of your shoulders to the pack frame. If the straps go down your back too far to the frame, too much weight will be pulled onto your shoulders (the pack is too small). If the straps go up, too little weight will go onto your shoulders (the pack is too large). The ideal distribution is about 80% of the weight on your hips and 20% of the weight on your shoulders. The width of the straps should be positioned such that they neither pinch your neck nor slip off your shoulders. Sternum straps, if present, should connect a couple inches below your collarbones, where they won't choke you or sit too low across your chest.

If your external frame pack has load lifters straps (MOST DON'T), the shoulder straps should anchor to the frame straight back, not down like an internal. The load lifting straps control how closely the load is pulled towards your upper torso. By pulling on the load lifting straps, you pull the load closer to your center of gravity, but this also puts much of the weight onto your shoulders. Much of the time it will be preferable to loosen these straps and put much of the weight onto your hips.

Fitting Internal Frame Packs

Virtually all internal frame packs have a set of straps that go from the front of each shoulder strap, to the top of the pack. These are called "load lifters" (sometimes "load stabilizers"). They serve two functions: (a) to stabilize the pack and (b) to make sure that any weight being borne by the shoulder straps is taken off, and lifted back, onto the frame of the pack, putting the weight onto your hips.

To correctly adjust the load lifters straps the shoulder straps must be fitted correctly first, they should be anchored to the frame about 2 inches below the back of your shoulders. The padding should cover the area of contact with the shoulder and extend in front, couple of inches down below armpit height. The load lifters should connect to the shoulder straps at about collarbone level, and go up and back, at about a 45 degree angle, connecting at the frame at about earlobe height or so. If the angle is really low, the strap won't lift up, as much as back, thereby not taking any weight off. If the angle is too high the same result is produced. Some packs have adjustable sliders on the load lifters, in that you can control where on the shoulder they pull from. Unlike external frame packs, load lifter straps lift the shoulder straps off of your shoulders and pull the top of the pack in closer to your body. This allows the weight to ride more on the hips and less on the shoulders while keeping the load stable. As with external frame packs, the ideal distribution is about 80% of the weight on your hips and 20% of the weight on your shoulders.

Most internal frame packs also have hip stabilizers, straps that go from the middle of the hipbelt to the sides of the pack, one each side. Adjusting the hip straps determines how close the pack rides to the hips. These straps pull the pack into the hips and lower back to increase stability.

On most internal frame packs, the 2 stays (the frame) usually can be custom bent to fit your back. If you take the stays out, mark them, to know which way they go back in. After the pack is "packed" tighten the compression straps on each side of the pack itself, these keep the load from shifting. Most internal frame packs need break in period, like boots. The pack should feel "fitted" after a week or two on the trail.

How to Pack Your Backpack

How you pack your gear is important to your comfort. The type of pack you have and the type of hiking you plan on doing will dictate much of where things will actually be packed inside. No matter what or how you carry your gear the important thing is to keep the weight as light as possible. An ideal backpack weight is 1/5 of body weight and a maximum comfortable pack weight is 1/3 of body weight.

There are different thoughts for where to place the heavier items. Heavy items go against your back, high for comfort while trail walking; low for good balance while hiking off-trail or climbing. No matter where you place the weight, be sure it sits closest to your body. If you plan on hiking steep narrow trails like you may find in the Grand Canyon, you will generally feel more secure and comfortable with the heavier items, such as tents, sleeping bags, food for camp, and cooking gear packed towards the bottom of the pack. This puts the weight closer to your center of gravity and helps to alleviate that top-heavy feeling. And, you do not want heavy items hanging off the back of your pack while you're walking; they have a tendency to make you feel like you are falling backwards. This is not a comfortable feeling near Grand Canyon drop-offs!

One of the things that can be frustrating is finding things in your packs. If you organize things logically, you will have an easier time finding stuff. For example, place your stove, lighter or matches, fuel, and dishes all together in a stuff sack. Put all your clothing into another, and your personal hygiene into another. It will help even further if you use different color stuff sacks for individual purposes. You will be surprised at how much more pleasant backpacking is if you're not spending more time than necessary searching for things.

Before you start to pack stop and think. You should only need your tent once a day, when you make camp. So pack it away in the deepest recess of your bag. The same holds true for your flashlight and spare clothes. Tent poles should be bagged and tied to the pack so they don't come loose and fall out.

The things you need to get at frequently should be in the side pockets of your pack where you can get at them. Water, snacks, map, compass, raingear, camera should all be accessible with the flip of a zipper. Your main meal supply should be stored separately from your other gear. If you bring an extra pair of gym shoes and expect to be crossing streams during the day, tie the shoes to the back of your pack so you don't have to empty everything out to find them. And don't forget to put your raingear where you can get at it quickly.

Packing External Frame Packs

External packs are recommended for on-trail travel only. Load heavier items high inside your pack and close to your body. Doing so centers the pack's weight over your hips and helps you walk in a more upright position.

Pack your sleeping bag in its stuff sack. Finish loading your main packbag, then strap the sleeping bag to the lash points on the bottom of the packbag. You may also strap the tent to the frame on the bottom of the pack. The sleeping pad can be strapped to the top of the either type of pack. If rain seems likely, consider stuffing your sleeping bag inside a second stuff sack or wrapping it in plastic.

Packing Internal Frame Packs

In order for the internal frame pack to carry correctly, everything should be packed inside and not strapped on the outside. For instance, a bulky sleeping bag and tent will take up a lot of room in the pack, so you will need to consider a bigger pack or smaller sleeping bag or tent if this is a problem. You can add external pockets and straps to carry more gear, but remember: the concept behind an internal frame is to keep the load as close to your body as possible.

For on-trail travel, keep heavy items higher inside your pack. This helps focus more of the weight over your hips; the area of your body best equipped to carry a heavy load.

For off-trail exploration, reverse the strategy. Arrange heavier items lower in the main compartment, starting again from the spot between your shoulder blades. This lowers your center of gravity and increases your stability on uneven terrain.

Stuff your sleeping bag into your packs lower compartment first. Squeeze in any additional lightweight items you won't need until bedtime (pillowcase, sleeping shirt, etc.). This will serve as the base of the main compartment, which you'll fill next. After packing tighten all compression straps to limit any load shifting.

Tips for Packing Either Pack Style

- Make sure some items are easily accessible, packed in places where they can be reached with a minimum of digging:

Map	Compass
Sunglasses	Insect repellent
Snack food	Flashlight
First aid supplies	Water bottles
Rainwear	Packcover

- Don't waste empty space. Cram every nook with something. Put a small item of clothing inside your pots, for example. Smaller items, such as food, pack more efficiently in individual units rather than when stored loosely inside a stuff sack.
- If you are part of a group, split up the weight of large items (a tent, for instance) with other group members. Don't make 1 person become an involuntary packhorse.
- Cluster related small items (such as utensils and kitchen items) in color-coded stuff sacks to help you spot them easily.
- Minimize the number of items you strap to the outside of your pack. Gear carried externally may adversely affect your balance. Secure any equipment you carry outside so it doesn't swing or rattle.

Tips: How about long tent poles, for example? Stow them horizontally with your sleeping pad across the top of an external pack; with an internal, carry them vertically, secured behind the compression straps on one side of the pack with the ends tucked into a "wand pocket" at the pack's bottom. A daisy chain and ice axe loops are designed for specific mountaineering gear; feel free to improvise with them, but don't get so creative that you jeopardize your comfort or stability.

- Make sure the cap on your fuel bottle is screwed on tightly. Position it below your food inside your pack in case of a spill.
- Carry a packcover. Backpacks, though made with waterproof fabric, have vulnerable seams and zippers. After a few hours of exposure to persistent rain, the items inside your pack could become wet and thus much heavier.
- Quick repair tips: Wrap strips of duct tape around your water bottles; in case a strap pops or some other disaster occurs, a quick fix could keep you going. Take along a few safety pins in case a zipper fails.
- Pack clothing around items in your pack so they don't shift around.
- Items you'll need during the day go on top or in locations that are readily accessible.
- Be sure to keep the food you will require while hiking accessible.

FIRST AID

It is uncommon to have more of a problem than a slight burn or a minor cut; so a simple first aid kit will probably suffice. You probably won't have to deal with a serious injury in the woods; but, if you do, a life could be at risk because the party could be hours away from medical care.

Aspirin or ibuprofen is good to have because you will probably ache, at least once.

Remember the Moleskin. When hiking, you are likely to get blisters. They can be always be prevented. Take along moleskin (adhesive padding) and put 1 - 2" squares of it on any spot that hurts before it gets blistered. You can get moleskin at your pharmacy. Another foot tip--cut your toenails before the trip or you could end up with blackened toenails.

Review your Scout Handbook about what kind of First Aid supplies you should have with you. Carefully study First AID for blisters, sprains, minor burns, minor cuts, sunburn, insect bites, and heat exhaustion as these are the most common medical emergencies you will encounter on the trail.

Clothing

Simple rules to remember, the more waterproof a fabric, the less breathable it is. Synthetic fabrics wick away moisture better than natural ones. Dressing in layers is usually better than rely on one piece of clothing to protect you because it traps heat and provides you with more options. Check the weather forecast to determine what weather conditions you need to dress for. See the Winter Camping paper on how to dress for winter warmth. A hat in summer will keep you cool and prevent your from getting a sunburn. A warm cap in winter is a must for retaining body heat.

Don't go on any extended backcountry trip without one complete change of clothes wrapped in a watertight container. Two sets would be even better. No one ever died from having too many clothes in their pack. Even if it doesn't rain, a slip in a creek or lake could leave you soaking wet. It also might not be a bad idea to change your clothes after a few days just to freshen up. Also remember that if you're not carrying a heavy coat or jacket dressing in layers is the next best way to retain warmth when things get chilly.

If you plan on doing any stream crossings you should bring along a set of old gym shoes. Never cross a stream bare-footed. And under no circumstances should you get your boots wet because it can take days for them to dry out. That will mean blisters and pain. Change into the gym shoes to cross the creeks because many are filled with rocks and debris that could slice a foot open. Algae and other vegetation can also grow along river bottoms making them treacherous to cross.

And one final thing you should always like to wear, a belt. It not only gives you a place to carry your knife, but can also serve as a tourniquet or backpack strap should one of my regular straps break.

Boots and Socks

Boots and socks made for hiking are a must for long hikes. The boots should be ankle height to give support to the ankle. They can be made of leather or a combination of leather and heavy cordura cloth and should have lug soles for traction. Leather boots treated with Snow Seal (added after purchase) will be somewhat waterproof, yet allow the boot to breathe, which makes for happier feet. Cordura boots are lighter in weight but are not waterproof unless made with Gor-Tex, which dramatically increases boot price. Check to make sure it has quality stitching. And buy boots that have eyelets with metal or plastic rings to prevent the material from tearing around the hole.

One pound of boot is the same as strapping another five pounds on your back; the heavier the boots the more work you are going to have to do to move your feet. So in general lighter is better. If you are going to be doing a lot of off trail hiking or rock scrambling you will need boots with a strong sole, a hard toe to protect your feet from falling rocks and a boot that offers strong ankle support.

First decision: Leather or nylon? Leather is more durable and offers more support than nylon. Also, properly waterproofed leather will keep your feet dry. Leather can take weeks to break in; but once broken in leather can be very comfortable. Leather cost more than nylon – a consideration when purchasing boots for kids who will quickly outgrow them. If leather is your choice, select a pair with as few seams as possible. Find out if the leather is "full" or "split" grain leather, full grain leather is much more durable and weatherproof.

Boots made of nylon and leather are cheaper, lighter, and cooler on hot-weather hikes. Also, break in only takes hours, not days or weeks like leather. Nylon boots do not offer the firm ankle support that leather does.

High-top boots extend over your ankles and give you more support than boots cut level with or below the ankles. When you carry a heavy pack of hike a rugged trail you want this added support and protection. On well-maintained trails a low-top boot will work just fine.

Look for boots that have a part leather and part synthetic lining. The leather lining usually will be in the toe and heel areas where the high wear occurs.

Make sure you buy hiking sock liners and wool hiking socks BEFORE you go to buy boots and take them with you to try the boots on in the store. Your feet should not slide around inside the boots and there should be some room in the toe so that your foot is not banging into the front of the boot on those downhill walks.

Hiking boots should always be worn with sock liners and wool hiking socks. The liner socks will stick to the heel and foot while the wool sock will stick to the boot. In this way, the friction of the foot moving inside the boot will occur between the layers of socks, not the layers of skin (which causes blisters). This combination will also help pass moisture away from your foot. People wonder why you should wear a wool sock with summer heat. Since wool doesn't absorb water, it passes the moisture from your foot outwards, keeping your foot dryer. If your feet stay damp, they get wrinkled and are more prone to blisters. Wool socks also give good cushioning. Do not wear cotton socks.

Raingear

Raingear is very important because no matter how well you plan your trips, sooner or later it is going to rain. And there is no reason you can't continue along the trail when it begins to rain.

When rain begins to fall the real moisture enemy often isn't the rain, but the sweat generated by your body. If it is 75 degrees out, raining and you are hiking with raingear on you are going to sweat. No matter how breathable the fabric you are going to get wet from that sweat.

If it is raining and you are hiking in hot, humid conditions strip down to a polypropylene shirt to wick away moisture from your body on top. You might also try wearing a pair of hiking shorts under your rain pants to help your body breath on the bottom. Try to find a rain suit with sleeves that button around your wrist. You won't believe how much water can get in that way. You might also slow your pace to reduce the amount of perspiration being generated by your body.

Cheap plastic rain gear usually does not last too long; it tends to tear easily and cracks easily in the cold.

Get a rain suit complete with a jacket and pants. Your jacket should have a hood and vents in the back and under the arms to provide some ventilation. Make sure you buy rain pants that will fit over your boots. If you do get caught in a sudden rain, the last thing you want to do is take your boots off and struggle to get your rain gear on. If you're soaking wet before you get it on, it won't do you any good. Try to avoid the rubberized canvas jackets if you can. They are heavy and usually result in your getting hot and sweaty, coated nylon is recommended.

If it's not too windy a poncho works great. The large opening around the bottom helps vent moisture and if it's big enough it will cover both you and your backpack.

Don't forget a rain cover for you backpack, you may want to set you backpack down on the ground in the rain.

Water

When you talk about weight, don't forget about water. Water is very heavy. One gallon of fresh water weighs over 8 pounds, each quart over 2 pounds.

Unfortunately, the quality of the water in many backcountry areas is deteriorating. That means if you plan on backpacking in the backcountry you will have to purify your water before you drink it. A number of water borne fungi, cysts and parasites now inhabit the backcountry waters. The most publicized is Giardia, a cyst that can infect the toughest backpacker and turn him or her to mush.

You can use pills or filters for water purification; both methods have limitations to their effectiveness. Pills are lighter but add a flavor to the water (dissolving vitamin C tablets in the water may improve the taste). Filters are heavier, but don't impart any taste to the water. **NEVER ASSUME WATER IN THE FIELD IS POTABLE!** Boiling works but it is a nuisance, it takes time and lots of fuel and leaves you water tasting flat. There are problems with filters, they are difficult to pump and can become clogged. Purification pills are generally safe for daily use for up to 3 months, except they are not to be used by pregnant women. The pills seem to kill all known 'critters' except Cryptosporidium.

Don't forget to take water bottles, you'll need someplace to put the water. You'll need at least a quart of water, more is better. Whatever your choice, water bottles should not leak if you turn them upside down and leave them that way for a while. Carry two quarts of water if you were planning to be away from water, a quart if you are near water. DRINK PLENTY OF WATER WHEN OUTDOORS!

Food and Cooking

Your cooking kit should be simple if you are planning an extended backcountry trip. A basic mess kit will usually contain a small pot, fry pan, unbreakable drinking cup, and a set of eating utensils.

You do not need expensive dehydrated food from the sporting goods store for backpacking unless weight is at a premium. Go to the grocery, instead. Look for rice and noodle packages. Little cans of chicken. Dehydrated soups. Instant oatmeal. Dried fruit. Little cans of mixed fruit. Summer sausage. Granola bars. Candy. Make a trail mix of granola and M&Ms. Bagels or English muffins seem more durable than bread. Remember that you'll be burning a lot of calories hiking. Also, don't forget a rope to tie you food up off the ground when in bear country.

Food

Since refrigeration, and ice, is out of the question the food you take must be of the non-perishable variety. Before going out on the trail develop some meal plans and actually prepare the food so you will understand what ingredients and how long it takes to cook it. Even use the stove you plan on using on your trip. It better to understand how you will prepare your meals than to go without eating. Consider preparation and cooking time and how much fuel the meal requires.

Some sample foods for meals may include the following:

Breakfast

- Instant oatmeal
- Nutrigrain breakfast bars
- Pancakes
- Powered Eggs
- Bagels (Bagels keep longer than bread and don't squish)
- Pop Tarts
- Dries Fruit
- Hot Chocolate
- Granola bars

Lunch

- Instant soups
- Hot Dogs
- Raman Noodles
- Trail Mix
- Cheese (low moisture cheeses like Swiss and cheddar will keep for a few days)
- Jerky
- Salami
- Crackers

Dinner

- Instant soups
- Minute Rice
- Spaghetti
- Pasta (thin cooks faster)
- Macaroni and Cheese
- Rice-a-Roni
- Dried Beans
- Freeze-Dried Dinners
- Instant Potatoes
- Dehydrates Vegetables
- Cornbread
- Instant Pudding
- Raman Noodles

Snacks

- Crackers
- Pretzels
- Granola Bars
- Dried Fruit
- Jerky
- Trail Mix (raisins, cashews, BBQ-flavored almonds, Choc. Chips, etc.) (Develop your own recipe!)

Condiments

- Salt and Pepper
- Ketchup and Mustard
- Peanut Butter
- Sugar
- Powered Milk
- Cooking Oil

Stove

You need a way to cook food. When in the field a fire is not the best option. Wood may be hard to find it may be wet and hard to burn, your pans will be covered with soot that will somehow find its way onto other gear. A simple stove you might use would be one that burns alcohol; the most common brand name for this type of fuel is Sterno. Use a couple of rocks to support your pan over the fuel can.

It may take lots of practice but you will need to learn how much fuel you will need to pack. Fuel weighs much the same as water but will not be readily available in the field. Carefully plan your fuel requirements.

If you do a lot of backpacking you will eventually want to acquire a small, lightweight, single burner stove. There are two possibilities and each has its advantages.

- Butane fueled stoves are probably the most convenient to use. You just attach the butane cartridge and light the stove. It is like lighting a gas stove at home. There are some drawbacks to butane stoves. They don't heat well at temperatures below about 30 degrees Fahrenheit because the butane liquefies; but fuel canisters with a mix of butane and propane seem to work adequately at lower temperatures. Fuel is somewhat expensive, but since you are not heating your home for the winter this may not be important. Butane cartridges are not widely available except in outdoor stores, so you must carry a spare cartridge and keep a stock at home. For three-season trips of less than a week, butane would be my fuel of choice.
- The other option is liquid fuel. This fuel is usually known as "white gas" or Coleman fuel. Modern stoves burn multiple fuels—white gas, unleaded gasoline, and kerosene—although white gas remains the fuel of choice. Like butane stoves, liquid fuel stoves are lightweight. The fuel bottle and the burner are separate units connected by a hose. Fuel is widely available and cheap. These stoves work well in cold weather. When you light them they tend to flare up initially. Sometimes the jets become clogged, especially with gasoline as a fuel. Coleman Peak One is a good choice for this kind of stove.

Navigation

If you'll be hiking in an area you don't know well you'll need a map. Use your map to plan your route before you start out, and let someone know where you are going. Figure out where you'll find water. If you are a novice, plan on 1 mile per hour, plus an hour for every 1000-feet you'll climb. You are not likely to walk faster than 1.5 miles per hour on the trail, especially in hilly country. Five or six miles may be enough for your first outing. Carry your map with you and check it regularly—know where you are. It is not really safe to go without a map unless you are very familiar with the area.

To use your map correctly you'll need a compass, especially if you plan on hiking off-trail. You may not use a compass on well marked trails, but it could be very handy if you become disoriented at intersections. Depending upon your objectives, you ought to know a little or a lot about how to use a compass. Get a clear compass that you can place on a map and see through. This allows you to line the compass up with the features on the map.

Tents

You need to get the proper tent to keep you dry in the rain and protect you from the wind and insects. The tents our Troop has are excellent. If you plan to purchase a tent for you own use there are a few thing you should consider.

A good tent does not have to be expensive. A good tent consists of an inner tent that is almost completely covered by an outer covering or “fly” that keeps water off the inner tent. The fly must extend almost all the way to the ground, a feature missing in discount store cheapies. Most backpackers purchase a two-person tent, even if they plan to travel alone. Keep weight in mind; four pounds per person is probably an upper limit you would want to consider for a lengthy trip. Expect that two adults in a two-person tent will be very cozy. A two-man tent means exactly that, enough room for two people. It doesn't mean two men and all their equipment. When you acquire a new tent, you must seal every seam in the tent and fly; they usually come with liquid seam sealer. In cool/cold weather you must leave ventilation for moisture given off by your breathing or the inside of your tent will become covered with moisture.

There are many different kinds of tents. There are A-frames, geodesic domes, squared domes, pyramids, bike tents, simple summer tents, three season tents, four season tents, expedition tents and on and on. You can spend anywhere from \$50 for a simple summer tent up to the \$700 expedition tents. They can house anywhere from one person to an entire tribe. And they can weigh anywhere from 2 pounds to twenty pounds.

Things to look for in a tent include the following:

- Don't buy a tent unless it has a rain fly and screen netting on the doors.
- Your tent should have two doors to provide better ventilation on hot summer nights and easier access.
- It should be flame retardant.
- It should be waterproof/breathable nylon or similar material.
- The poles should be made of high quality aluminum alloy, lexan or carbon based materials that don't fail easily.
- Since the tent is one of the heavier items you carry be conscious of the weight when you buy your tent.
- And don't buy it unless you see how difficult it is to assemble and what it looks like all put together.

Geodesic dome style tents offers the most efficient use of space. They generally provide enough room to let you stand up to change clothes inside. However, you should be careful in this area because some domed tents may not hold up well in high wind areas.

The A-frame style tent hangs lower to the ground and is less likely to blow away, but it provides less living space inside. Some A-frames include vestibules, covered storage areas outside the tent where gear can be stored, sheltered from the elements.

Once you decide on a tent, try setting it up before you go. Time yourself to see how long it takes you to put it up. If a tent takes longer than 5 to 10 minutes to put up, find something else. You can't afford to spend 20 or 30 minutes trying to put it up if trouble strikes your party. Never leave on a trip without setting up your tent. Imagine yourself 10 miles from nowhere, darkness and rain approaching, only then discovering that a) you don't know how to set up your tent or b) some of the tent poles are missing. And don't forget the tent stakes to secure your lovely home at night. Always stake the tent even if it looks like it's going to be a perfect night.

A good tent to choose is a Eureka Timberline, a two-person tent priced at about \$100—good price, durable, keeps you dry in the rain.

Always use a ground cloth for the tent. This protects the bottom of your tent, and keeps ground water off it. This must be totally tucked under the edge of the tent when it rains or water will run between the ground cloth and tent floor and get your gear wet. A piece of plastic painting drop cloth is fine.

If you really want to go lightweight and don't want to deal with setting up and taking down a tent try one of the one-person bivies instead.

Note: no open flames in your tent.

Sleeping Gear

It all depends on where you're going and what the weather will be. There's a big difference between mountain backpacking and summer desert camping. Review the Winter Camping paper for sleeping in any weather where the temperature is expected to get colder than 50 degrees Fahrenheit. Don't shell out big bucks for a bag if you are taking a summer trip where the overnight low will be warmer than 50.

Invest in a waterproof sack to carry your bag in. If your sleeping bag gets wet it could take days to dry out depending on the material. A wet bag is useless, so make sure it stays dry. You can also use the sack at night as a pillow. Stuff it full of clothes and you've got a nice fluffy pillow, just like home. Never pack away a sleeping bag that is wet. You are asking for trouble. A wet sleeping bag may be worse than no sleeping bag at all. Avoid cotton fill bags (the type with cotton outer shells), they absorb moisture like crazy and they take forever to dry.

Invest in a good pad for your sleeping bag. Many times you will be forced to pitch a tent on ground that's not perfectly flat or filled with lumps and bumps you just can't avoid. A sleeping pad under your bag will help smooth out some of those bumps and save your back. It will also insulate you from the cold ground below. Those inflatable mattresses you float around on in the pool are almost worthless; they puncture too easily and offer no insulation. See the Winter Camping paper for a good discussion of sleeping pads.

Backpacking Checklist

What and how much you should take with depends on where you're going, who you're going with, the weather you'll encounter, and how long you're going to be gone. Each piece of equipment, food and clothing will add to your load. If you're carrying more than 1/3 your body weight you're asking for trouble. Obviously, the more people in your party, the more you can spread out the load. Also, the strongest members of the team should carry the most, but there's no law that says you can't shift the load as the trip goes by. The best test of all, take your pack, load it up, weigh it, and go for a walk.

The following is a list of gear you should take backpacking (**not** including the clothes you will be wearing):

Transportation

- Backpack. You should also have sleeping bag straps, or rope to hold your sleeping bag onto the pack.
- Rain gear.
- Map.
- Signal whistle. Three toots signals "help me."
- Licenses and permits.
- Walking Staff?
- Sunglasses.
- Bear bell if hiking in bear country.
- Flashlight. Small (AA batteries size) and lightweight. Bring new batteries. Bring extra batteries and maybe an extra bulb. Turn one battery around when in your pack so the flashlight will not come on.
- Water bottle for hiking and day activities. Two 1-quart water bottles or canteens. Water bottle holster for trips without your pack.
- Compass.
- Pocket knife. Select one with useful tools included.
- Water resistant wristwatch.
- Field books?
- Waterproof pack cover.
- Camera and film.
- Wallet.
- Money

Sleeping List

- Something to read if your stuck in your tent. Cards?
- Tent.
- Sleeping bag with stuff sack. Line your stuff sack with a sturdy plastic bag to give yourself added protection from rain and/or the river.
- Closed cell foam sleeping pad or self-inflatable mattress.
- Ground cloth.

Clothing

- T-shirts
- Sweater
- Pants
- Underwear
- Belt
- Warm hat
- Boots with extra laces
- Shoes for stream crossing
- Shirts
- Jacket
- Shorts
- Swimsuit
- Brimmed cap
- Mittens or gloves
- Socks – wool and liner

Cooking

- Unbreakable cup
- Water purification tablets or water filter
- Bowl
- Backpacking stove
- Matches or lighter
- Sealed containers
- Can opener
- Knife, fork, and spoon
- Cook pots, frying pans, and utensils
- Scrub pad
- Stove fuel and fuel funnel
- Aluminum foil
- Biodegradable soap
- Bags for trash

Personal Items

- Toothbrush and toothpaste
- Chapstick
- Soap (shaving cream and razor)
- Toilet paper
- Comb
- Sunscreen
- Wash cloth and towel
- Insect repellent

Miscellaneous

- First Aid kit
- Rope (50 feet)
- Extra eye glasses or contacts and stiff carrying case
- Sewing kit
- Spare pack parts
- Thermal blanket for emergencies
- Plastic garbage bags – can be used as a pack rain cover or to waterproof the contents of your pack like your clothes
- Radio? – only if you need to keep an ear on the weather
- Fishing tackle? (keep it simple)
- Paper and pencil
- Small trowel for digging a toilet
- Stuff sacks for organizing the stuff in your pack
- Binoculars?
- Snake Bite Kit?
- Medications you will need
- Repair kit – may include steel wire, nylon cord, duck tape (wrap duck tape around your water bottle), nylon fabric repair kit
- Candle – has various uses like fire starter, emergency light, melt end of a nylon rope
- Lightweight saw

Things You Do Not Need

- Sheath knife – pocket knife is enough
- Ax. Too heavy and dangerous. Use a saw instead.
- Heavy rope
- Lantern
- Gun
- Walkman radios