

While hundreds of people climb Pinnacle Mountain every day with nothing but what they are wearing and some even without any water, for any lengthy or overnight hike away from the cars, all hikers should carry certain essential items:

\* The following material adapted from Wilderness Travel Student Handbook (c) Sierra Club - Wilderness Training Committee, 1997.

## THE TEN ESSENTIALS \*

### TO FIND YOUR WAY:

Map of the area, Compass, Flashlight

### FOR YOUR PROTECTION:

Sunglasses, Extra food and water, Extra clothing

### FOR EMERGENCIES:

Waterproof matches, Fire starter, Pocketknife, First aid kit

In an emergency, these items cannot be improvised, and they can save your life. Keep them in a small bag, ready to be thrown into your pack whenever you leave the road. The emergency you are preparing for may involve sitting out overnight, lost and perhaps injured. Think of this when planning your Ten Essentials. Each hiker should have and carry his or her own Ten Essentials on every trip.

### MAP

A map is your guide to a wilderness adventure. Without your map and the knowledge to use it, your adventure may turn into something less than enjoyable. There are several types of maps available that show trails and landmarks in wilderness areas, but the most useful is the USGS topographical map. "Topo" maps are available for around \$8.50 per map at the Arkansas Geological Survey office on Roosevelt Road or for free download at [usgs.gov](http://usgs.gov).

### COMPASS

A compass is an extremely useful aid to navigation, providing it is used with a topo map. A suitable compass for wilderness navigation must have the following features:

- A transparent baseplate with straight sides.
- A rotating center dial, also with transparent base, graduated *clockwise* in 1- or 2- degree increments from 0 to 360 degrees.
- The central dial enclosing the pivoting magnetic needle must be *liquid filled* to dampen oscillations and permit fast, accurate results.

This type of compass costs between \$10 and \$40 depending on the make and model; the \$10 model is entirely adequate for expert or student alike. (A commonly available \$5 model is really not accurate enough to satisfy the need.)

### FLASHLIGHT

A flashlight with EXTRA BULB and BATTERIES is basically an emergency tool and should be carried with this in mind. You should always have eight hours of light available; in an emergency, you may have to hike all night, and you'll need a flashlight to light your way. Different batteries and bulbs have varying amounts of light capacity.

### SUNGLASSES

Sunglasses are essential to protect your eyes. Your sunglasses should be dark enough to cut the light intensity down to a comfortable level. If you can read print through the lens placed on a newspaper, the lens is not dark enough. Beware of the type that changes in darkness automatically. Your sunglasses should be composed of glass (which blocks ultraviolet rays, unlike most plastic lenses)

At high altitude, the sun's radiation is more intense, as it has less atmosphere to go through and can burn your eyes more easily. At higher elevations, even the reflection from snow fields and light-colored rock can concentrate enough light to burn unprotected eyes and sunglasses should prevent light from entering at the side and bottom of the glasses. You can get side and bottom protection by wearing ventilated ski goggles over regular sunglasses. On snow, the sunglasses must block almost all ultraviolet light. Glasses that also block infrared light are desirable as they will improve your night vision for the drive home. Mountaineering glasses are best and can be purchased ground to your prescription at about the cost of regular glasses.

### EXTRA FOOD & WATER

Extra food & water means just that: food that you will not use except in an emergency. You might carry it in a special container away from your regular food items. Perhaps take something that is not particularly appetizing but has plenty of food value; high carbohydrate, low-fat snacks (sugar) and high-energy fruit bars are popular. EXTRA WATER usually means having about half again as much water as you think you will need on the outing. Gatorade is a good energy and mineral addition to water.

### EXTRA CLOTHING

What kind of extra clothing you will carry depends on what type of trip is planned. For a day hike on a cold day, in addition to your hiking clothes, you may carry a rain jacket and pants, wool shirt or sweater, head protection, mittens, and extra socks. Remember, an emergency may keep you out all night. Will you be properly protected?

### WATERPROOF MATCHES

Waterproof matches should be carried away from your normal daily supply so they will always be available. Make sure your emergency supply is

"waterproofed". Put the matches with a small strip of sandpaper in an absolutely waterproof container.

## **FIRE STARTER**

A candle, fuel tablets or other long-burning fire starter is essential when trying to start a fire with damp kindling. The candle or chemical fire will burn for about 10 minutes, gradually drying the kindling, then igniting it.

## **POCKETKNIFE**

A pocketknife is an essential tool for the wilderness traveler. It is used in food preparation, cork pulling, first aid, fire building, equipment repair, etc. The Swiss Army knife is most popular.

## **FIRST AID KIT**

A first aid kit is necessary because, if a medical emergency occurs in the wilderness, professional help could be hours, even days away. The kit should be in a small, compact and waterproof container. Everyone should have at least a minimal kit including such essentials as band-aids and moleskin (or other blister treatment).

# **EQUIPMENT**

The governing rule is, never to buy anything until the next outing demands it. By improvising, modifying, borrowing and renting, the basic outfit can be budgeted over the first year or two. In succeeding years, stopgaps can be gradually replaced, all the more wisely for the delay, and specialized tools accumulated. - *Mountaineering, Freedom of the Hills, 4th Ed.*

An equipment checklist (below) provides an indication of how much money you may expect to spend on equipment. You may already own much of this equipment. Most of the major items of equipment (tent, sleeping bag, stove, backpack) can be rented, thereby saving a substantial amount of money. Some items of clothing can easily be made at home. Surplus stores often carry acceptable substitutions at substantially reduced prices.

For any items to be carried on a backpack, consider weight: The wrong choices could easily add 10 pounds to your backpack. And make sure that the items you buy adequately meet your needs.

## **FOOTWEAR**

**BOOTS** are the most important item of your equipment. You will need a medium weight hiking boot that can be snow-sealed for winter mountaineering. The boots should be six to eight inches high, have lug soles, a minimum number of seams and reinforced heel and toe. Split-grain leather boots will probably be soaked after one day in rain or wet snow and may need replacement after one season

due to stretching leather. Full-grain boots are more durable but take longer to break in. Many boots now have a Gore-tex or other waterproof liner.

Mountaineering shops usually have salespeople who will help you get a good fit. Ask the salesperson if a boot can be snow-sealed to keep water out (and which snow-seal to use). Decide how much you can afford, then try on as many different makes (in your price range) as possible, in order to get a good fit. Expect to pay \$90 - 250 for a pair of good mountaineering boots.

Open the boot wide. Wearing two pair of socks, slide your foot forward until your toes just touch the front of the boot. There should be one finger thickness space behind the heel. Then lace up the boot. Heel movement should be minimal. Toes should not touch the front when walking downhill. Ball of foot should not move sideways. The bottom inch of boot must fit as it will not break in. The upper part will probably adjust to your foot. To break in, walk short distances first, then longer distances.

**SOCKS** - Wool outer and polypropylene (or other synthetic) inner socks are the only kind worth wearing. It is comfortable to wear a thin smooth-knit pair next to the skin, with a heavy rough-knit pair on the outside to provide insulation and padding from shock. You should carry an additional set in your pack, in case your feet and socks get wet. Remember to take these socks with you to wear when you are trying on your new boots. Cotton socks should be avoided. Wet cotton provides practically no insulation and cotton is difficult to dry.

**GAITERS** [more commonly used when hiking on snow or off trail] - made of tough nylon join the boots and pants and keep snow and scree out of the boots. For snow, they should extend from near the toe of the boot almost to the knee and be coated with waterproof nylon or preferably Gore-Tex®. Uncoated nylon quickly gets soaked in wet snow in the spring and should be avoided. Elastic can get soaked in wet snow, freeze overnight and be very difficult to put on the next morning - yet most gaiters are sold with elastic. Make sure the gaiters will fit over your boots. For dry weather, shorter gaiters covering the top of boots help keep small rocks and other debris out of the boots.

## **FABRICS**

**COTTON** has no insulating value when wet. A beginner who economizes by wearing cotton sweatshirt, T-shirt and blue jeans will soon find these clothes soaked from sweat if not from rain. When wet, cotton fabrics rapidly conduct heat away from your body. Avoid cotton.

**DOWN** clothing consists of a nylon shell filled with goose or duck down, materials famous for compressibility and for insulation ability in dry cold.

Down clothing is very warm, very expensive and widely used on high-altitude expeditions. Unfortunately, down loses all insulating ability when wet.

**SYNTHETICS** such as Dacron, Orlon and polyester absorb little water and dry quickly. All are used in insulated clothing and sleeping bags and are similar to down in efficiency and continue to insulate when wet. Polyester pile clothing in knitted wear like sweaters give a thick, durable, insulated garment. Polypropylene (polypro) underwear is soft, wicks moisture away from the body and gives excellent insulation for its very light weight. Thinsulate® is a very small synthetic fiber which has high trapped air space for a given thickness of insulation; therefore, less thickness is required for equal warmth.

**WOOL** is a good insulator and has the advantage of continuing to insulate when wet. Wool is also durable and wears well.

## CLOTHING

Clothing keeps you warmest when worn in insulating layers. The still air between layers of clothing and dead air cells in the material combine to insulate and retain your body heat. These layers can be covered with an outer shell to protect you from wind or rain.

When you are climbing hard, your body is generating a lot of heat. You should remove layers (sweater, jacket) and let heat escape. When you arrive at a rest stop and sit still, you will not be generating much heat and may need to add layers to insulate and keep warm. The clothing should be loose-fitting, so it doesn't interfere with movement, and it should overlap at waist, neck, wrist and ankle.

Before 1980, the standard clothing for mountaineering was **WOOL PANTS** and **WOOL SHIRT**. A fishnet T-shirt (preferably wool) was frequently worn under the wool shirt. (If you buy a fishnet T-shirt, make sure it has solid shoulders if you plan to carry a pack.) A wool shirt that can be washed is more convenient than one that must be dry-cleaned. Wool may shrink when it gets wet: Buy a larger size than needed and expect shrinkage. Wool pants are expensive in mountaineering stores, inexpensive (\$10-\$15) in thrift and surplus stores. US Army surplus wool pants work well for winter mountaineering. German and Swiss Army surplus pants are usually too thick and too warm for use in the U.S. A disadvantage: Wool pants and a wool shirt are heavy and inconvenient: When the weather turns cold you must take them off to put on long underwear.

In the early 1980's, most hikers switched from fishnet and wool to polypropylene: polypro long underwear with nylon running shorts became a new standard for some years. This choice is lighter in

weight than wool and is more convenient: Extra layers can be added to the **OUTSIDE** when the weather turns cold. In summer, the single layer of fabric provides protection from the sun, yet ventilates well. By 1990, long pants made with nylon with removable legs became available and is now most popular (around \$40.)

Polypro usually comes in three weights. The lightweight polypro works well under most conditions (including summer), but the medium weight is probably a better choice for snow outings. A light colored shirt is better as it will not absorb as much heat from the sun. The heavier expedition weight is a good choice for extra clothing to be added over the inner layer when the temperature drops.

**HEAD PROTECTION** is essential in hot or cold or windy weather. Your unprotected head can lose up to 50% of your body's total heat production at 40° Fahrenheit and up to 75% at 5° Fahrenheit<sup>1</sup>. When your body loses heat this rapidly, it withdraws heat from the arms, legs and skin to protect the body's central core. Insulating the head stops this heat loss and provides sufficient heat to keep the whole body warm. This proves the wisdom of the old mountaineer adage: "When your feet are cold, put on a hat."

A hat with a brim will provide shade from the sun as well as some warmth in cool weather. Caps with brim, Gore-Tex® outer layer, and Thinsulate® (or equivalent) layer of insulation are also available. In cold weather, a wool or polypro stocking cap called a **BALACLAVA** is popular, as it can be pulled down over the entire head and neck to form a wind mask which insulates the head, and also protects the face from wind-driven ice particles. If you don't use a balaclava, consider a face mask available at ski shops for around \$10.

**MITTENS** keep the hands warmer than gloves because mittens are usually much thicker than gloves and because the fingers nest together warming each other, rather than being separated. The mittens should have a very thick weave and should be long enough so that finger tips do not press against the end. Expect some shrinkage if wool mittens get wet. In an emergency, wool socks can be used for mittens.

**GLOVES** are better than mittens for tasks requiring dexterity, such as adjusting boot laces, operating a camera, preparing a meal. Very light gloves worn under mittens allow you to perform light tasks without exposing your skin to freezing metal objects. **CAUTION:** Do not pick up hot pots and pans with polypro gloves as the polypro can melt. Wool gloves are more durable and can be used for such tasks.

**OVERMITTENS** should be waterproof to keep mittens dry. Don't buy breathable nylon! Combination

coated nylon with Gortex® is best. And remember to apply seam sealer.

**WATERPROOF RAIN JACKET AND RAIN PANTS** are needed to keep you and your clothing dry and warm in rain and fog. A rain jacket and rain pants allow the most freedom of movement and maximum protection. The rain suit must be waterproof, not just water resistant. And rain gear should preferably have seams sealed at the factory.

A rain suit of urethane-coated nylon (\$30) is acceptable, although condensation will be a problem. The best solution is a rain suit of Gore-Tex® or other waterproof, breathable fabric (\$60-200). Gore-Tex® claims the fabric to be waterproof to rain, yet allows water vapor to pass through, minimizing condensation. But consider weight: A coated nylon jacket may weigh 8 ounces while a Gore-Tex® jacket may weigh up to two pounds.

If the surface of Gore-Tex® is covered with snow or water, it loses its breatheability. Some rain jackets have underarm zippers for venting excess moisture. Rain jackets with vented backs are too likely to let the rain in and should be avoided.

**WIND PROTECTION** garments are shells of windproof (not waterproof) nylon worn to prevent the cold wind from seeping in and stealing heat. Specialized wind garments are an unnecessary extra as your rain suit can double as wind protection.

## **PACKS**

A **DAYPACK** is usually a nylon bag with shoulder straps and a zipper opening or a drawstring top with a flap. The bag should be constructed of waterproof nylon and must be large enough (2000 cu in) to carry your Ten Essentials, lunch, water and extra clothing. The daypack should have padded shoulder straps and a waist belt. If you ever plan to climb in snow, a desirable accessory is an ice axe carrier (a loop at the bottom and a place for a strap near the top). Leather accessory patches are even more desirable (necessary if pack is too small and you have to tie things to the outside). A leather bottom is more wear resistant for rock climbing, but is unnecessarily heavy. Cordura material is more durable than thin nylon but also weighs more. Inexpensive packs (\$20) can be found, but check sewing and zipper before buying. Since a daypack is frequently carried along on a backpack, a lightweight pack (20 ounces) is preferred.

**Day packs** are used for day hikes. **Back packs** for overnight trips away from the car come in two types:

A **FRAMEPACK** is a frame of tubular metal suspended from the shoulders by straps, with most of the weight resting on a padded hip belt or waist strap. The frame is held off the back by taut nylon bands and carries a pack bag with one or two large

compartments and outside pockets. Usually some gear (such as the sleeping bag) is strapped directly to the frame; additional equipment (skis, rope, crampons) can be attached to leather accessory patches on the bag.

**INTERNAL FRAME PACKS** eliminate the external frame of the frame pack and keep only the nylon bag with its suspension system and padded hip belt. Internal frame packs use inside aluminum stiffeners to hold the pack's shape. These packs ride closer to the back and many people find them more comfortable than frame packs. They are preferred for off-trail hiking, climbing and skiing.

## **FLASHLIGHT**

Different batteries and bulbs have varying amounts of light capacity. Most people now use either AA cell flashlights or headlamps - with heavy-duty batteries. Rechargeable ni-cad batteries run down too fast — and there is no easy way to recharge them in the wilderness. A sealed, throwaway flashlight is not adequate on a backpack. At 0°F, battery life may be only 10 - 50% of normal life.

If the top of the flashlight unscrews in less than 1½ turns, it is more likely to come apart in your pack, break and be useless. When putting your flashlight in your pack, reverse one battery so your flashlight won't "turn itself on" and discharge the batteries.

## **CAMPING EQUIPMENT**

A **SLEEPING BAG** is an insulated bag which should keep you warm and comfortable when you are asleep and your heat production is at its lowest. Check weight: An adequate bag can be found that weighs around 2 pounds - up to 6 pounds or more. Synthetic bags (Quallofill®, PolarGuard®, etc.) weigh more than down bags but continue to insulate when wet.

An **INSULATED PAD** is necessary to prevent heat loss to the ground or snow under the sleeping bag. The pad should be made of Ensolite or other closed cell foam. An air filled Therm-a-Rest® mattress provides more comfort - but (on snow) be prepared with alternate insulation in case the Therm-a-Rest® develops a leak. A full-length pad is required in snow; if your pad is not full length, you can take along an extra piece to lengthen it - and to use as a sit pad.

A **TENT** provides shelter from snow, sleet, wind, rain and mosquitoes. Mountaineering tents vary in size (and price) from a small one-man style barely big enough for a sleeping bag to lightweight palaces with room for four or more, including packs. Tents provide added wind protection and warmth and protection from storms. For snow, the tent must be capable of withstanding a winter storm, and all openings on the tent must have zippered solid coverings to prevent

blowing snow from entering the tent through window screens or door openings. A freestanding tent is desirable, but most people get by without one. A plastic sheet may be used as a ground cloth to protect the tent bottom. If you don't have an adequate tent, find someone on the trip who does and share. Two persons sharing a tent are warmer and have less weight to carry.

Tent stakes vary in size, shape and weight. Plastic stakes (1-2 ounce) have been known to break, resulting in an injury to the hand. Small skewers (1/3 up to 3 ounces each) are the lightest but don't work in snow. Snow stakes (around 1 ounce) have a larger surface and work better in snow. An alternate: tie flat objects (such as flat Mason jar lids with a couple of holes punched near the center) at the end of the guy lines and bury them in the snow.

There are just too many good (and bad!) designs available for anyone to impulsively purchase a major item without being positive about his or her own exact requirements. Question others about performance and read manufacturers' catalogs and claims. If possible, rent or borrow until you know what you want.

**CANTEENS** come in many shapes and sizes but the round liter size made of Nalgene plastic is favored by many. A belt bag to hang the canteen from your belt is handy as it lets you get a drink without stopping to take off your pack. An insulated bag may keep your canteen from freezing in cold weather.

**COOKING & EATING GEAR** can be very complicated but the simplest and most popular is just a one-quart pan, a cup, bowl, and a spoon.

**STOVES** available for backpacking are generally lightweight, efficient and reliable. White gasoline stoves are the most popular on longer trips but require priming and refilling from a fuel bottle. Butane stoves are easier to light and operate as they use a pressurized canister but may not work in cold weather unless you keep the canister warm from body heat. Isobutane stoves overcome the cold weather problems of butane stoves. If you don't own a stove, try to share with someone who does: Two people can share a stove.

Weigh the fuel tanks before and after each trip so you can learn how much fuel you use. Keep a record of this fuel usage to help you plan future trips. The weight can be marked on a short piece of masking tape attached to the can.

## **STOVE WARNINGS**

1. Be careful about insulating a fuel tank: If the tank gets too hot, pressure inside will build up, and the tank could explode.
2. Sleeping with a butane canister inside your sleeping bag is not recommended, since a leaking

valve could result in death from asphyxiation.

3. Do not refill a fuel tank near another stove that is burning. The nearby flame could ignite the fuel vapor.
4. Fuel storage containers have been known to develop leaks. At home, store fuel in a safe location away from stoves. Stay alert for fuel odor. Check container periodically for leaks. Consider setting container in a plastic pan to avoid leaking fuel saturating material underneath the container.
5. When removing a butane fuel canister from a stove, point the valve away from skin. In case the canister's valve does not close, the expanding vapor could quickly cause frostbite on exposed skin.
6. Boiling water is dangerous. Avoid placing (or moving) a pot of hot water where it could spill onto skin or clothing.