

THE TEN ESSENTIALS

The point of the Ten Essentials list has always been to help answer two basic questions: First, can you respond positively to an accident or emergency? Second, can you safely spend a night—or more—out? The Ten Essentials has evolved from a list of individual items to a list of functional systems that satisfy certain needs. As shown in Table 2-2, the classic list has been expanded to include hydration and emergency shelter. The systems are discussed in more detail below.



TABLE 2-2. THE TEN ESSENTIALS

Ten Essentials: A Systems Approach	Ten Essentials: The Classic List
1. Navigation	1. Map 2. Compass
2. Sun protection	3. Sunglasses and sunscreen
3. Insulation (extra clothing)	4. Extra clothing
4. Illumination	5. Headlamp or flashlight
5. First-aid supplies	6. First-aid supplies
6. Fire	7. Firestarter 8. Matches
7. Repair kit and tools, including knife	9. Knife
8. Nutrition (extra food)	10. Extra food
9. Hydration (extra water)	
10. Emergency shelter	

1. NAVIGATION

Hikers must carry the tools and possess the skills required to know where they are and how to get to their objective and back. Always carry a detailed topographic map of the area you are visiting, and place it in a protective case or plastic covering. Always carry a compass. you may also choose to carry other navigational tools, such as an altimeter or

global positioning system (GPS) receiver; additional aids include route markers, route descriptions, and other types of maps or photos. Know how to use map and compass and other navigation aids. If you are separated from your party, a whistle can be a simple but reliable signaling device.

2. SUN PROTECTION

Carry and wear sunglasses, sunscreen for the lips and skin, and clothing for sun protection.

Sunglasses. Ultraviolet rays can penetrate cloud layers, so do not let cloudy conditions fool you into leaving your eyes unprotected. It is advisable to wear sunglasses whenever you would wear sunscreen, and both are especially necessary on snow, ice, and water and at high altitudes.

Sunglasses should filter 95 percent to 100 percent of the ultraviolet light. They should also be tinted so that only a fraction of the visible light is transmitted through the lens to the eyes. Look in a mirror when trying on sunglasses:

If your eyes can easily be seen, the lenses are too light. Lens tints should be gray or brown for the truest color; yellow provides better contrast in overcast or foggy conditions.

There is little proof that infrared rays (heat-carrying rays) harm your eyes unless you look directly at the sun, but any product that filters out a high percentage of infrared, as most sunglasses do, gives added eye protection insurance.

Many HIKERS who need corrective lenses prefer using contact lenses instead of eyeglasses. Contacts may improve visual acuity, plus they do not slide down your nose, do not get water spots, and do allow the use of nonprescription sunglasses. Contacts have some problems, however. Blowing dust, sweat, and sunscreen can irritate your eyes. Backcountry conditions make it difficult to clean and maintain contacts. Eyeglasses protect your eyes better than contacts. Whether you choose contacts or eyeglasses, if you depend on corrective lenses, always carry a backup, such as a spare pair of eyeglasses or prescription sunglasses or goggles.

Sunscreen. Skin products containing sunscreen are also vital to your well-being in the mountains. Although individuals vary widely in natural pigmentation and the amount of screening their skin requires, the penalty for underestimating the protection needed is so severe, including the possibility of skin cancer, that skin must always be protected.

While hiking, use a sunscreen that blocks both ultraviolet A (UVA) and ultraviolet B (UVB) rays. UVA rays are the primary preventable cause of skin cancer; UVB rays primarily cause sunburn. To protect skin from UV rays, use a sunscreen with a sun protection factor (SPF) of at least 15. The SPF number means that the sunscreen is formulated to permit you to stay in the sun that many times longer than if no protection was applied, with the same effect. For example, wearing a sunscreen rated SPF 15 allows you to stay in the sun 15 times longer than if you were not wearing any sunscreen.

To protect skin from UVA rays, use a sunscreen that contains zinc oxide, titanium dioxide, or avobenzone (sometimes listed as Parsol 1789). Titanium oxide also blocks UVB and short-wave UVA rays. Manufacturers often use it in combination with zinc oxide.

All sunscreens are limited by their ability to remain on the skin while you are sweating. Some sunscreens are advertised as waterproof and will protect longer than regular products, but regardless of the claims on the label, reapply the sunscreen frequently.

Apply sunscreen to all exposed skin, including the undersides of your chin and nose and the insides of nostrils and ears. Even if you are wearing a hat, apply sunscreen to all exposed parts of your face and neck to protect against reflection from snow or water. Apply sunscreens half an hour before exposure to sun, because they usually take time to start working.

Clothing offers more sun protection than sunscreen. Long underwear or wind garments are frequently worn on sunny, high altitude hikes. The discomfort of long underwear, even under blazing conditions, is often considered a minor nuisance compared to the hassle of regularly smearing on sunscreen. Some UPF-rated garments (see "Putting the Clothing System Together," above) designed to maximize ventilation are meant for use in hot weather.

Lips burn, too, and require protection to prevent peeling and blisters. Sunblocks that resist washing, sweating, and licking are available. Reapply lip protection frequently, especially after eating or drinking.

3. INSULATION (EXTRA CLOTHING)

How much extra clothing is necessary for an emergency?

The basic hiking outfit (garments used during the active portion of a hike) includes good socks, boots or good trail shoes, underwear, pants, shirt, sweater

or fleece jacket, hat, mittens or gloves, and raingear, as appropriate. The term “extra clothing” refers to additional layers that would be needed to survive the long, inactive hours of an unplanned bivouac.

Extra clothing should be selected according to the season. Ask this question: What is needed to survive the worst conditions that could realistically be encountered on this trip?

An extra layer of long underwear can add much warmth while adding little weight to a pack. It is also wise to pack an extra hat or balaclava, because they provide more warmth for their weight than any other article of clothing. For your feet, bring an extra pair of heavy socks; for your hands, an extra pair of polyester or fleece mitts. For winter and severe conditions, bring more insulation for your torso as well as insulated over pants for your legs.

4. ILLUMINATION

Even if the party plans to return to their cars before dark, it is essential to carry a headlamp or flashlight, just in case. Batteries and bulbs do not last forever, so carry spares.

Lights vary greatly in their brightness. In general, brighter illumination consumes more battery power. The highest-powered lights require more weight in batteries to last long enough for several hours of use.

Technological improvements continue to make lights and batteries more efficient—xenon or halogen bulbs, brighter light-emitting diodes (LEDs), and better rechargeable batteries are examples. LEDs in particular have become very popular for their light weight, efficiency, and durability. Some lights combine LEDs with xenon or other high-powered illumination for versatility.

Headlamps. Few hikers carry anything besides headlamps, which allow freedom of both hands and, thus, are so much more convenient than flashlights.

Lights are important enough and temperamental enough to make it worthwhile to invest only in quality equipment. At a minimum, get a light that is at least moisture-proof (designed to keep out rain). Waterproof lights often merit their extra expense, because they function reliably in any weather and the contacts or batteries are less likely to corrode in storage.

All lights need durable switches that cannot turn on accidentally in the pack, a common and serious problem. Switches tucked away in a recessed cavity are excellent. So are rotating switches in which the body of the light must be twisted a half turn. If it looks as though a light switch could be tripped accidentally, guard against this danger by taping the switch closed, removing the bulb, or reversing the batteries.

Adjustable beam is an excellent feature available on some lights. Wide floodlighting is good for chores close at hand; concentrated spotlighting assists in viewing objects far away, making it possible to see farther than with a brighter light lacking this feature.

Make sure the spare bulbs and batteries you carry still work and fit the light.

Alkaline batteries. The most commonly available general-purpose batteries, alkaline batteries pack more energy than cheaper lead-zinc batteries. The major problems with alkalines are that voltage (hence, brightness) drops significantly as they discharge, and their life is drastically shortened by cold temperatures: They operate at only 10 percent to 20 percent efficiency at 0 degrees Fahrenheit (minus 18 degrees Celsius). Also, they tend to be heavy and are difficult to recycle or dispose of properly.

Lithium batteries. For longer life and lighter weight, lithium batteries are available, though at a higher price. Voltage remains almost constant over their charge, and efficiency at 0 degrees Fahrenheit is nearly the same as at room temperature. Lithium batteries may have twice the voltage of their same-sized counterparts, so make sure they are compatible with the light you are using. Again, recycling or disposal of spent batteries is a concern.

Rechargeable batteries. Today's rechargeable batteries are better than ever. The once-common nickel-cadmium types function well in cold conditions but do not store as much energy as alkaline or lithium batteries and are difficult to dispose of properly. Much "greener" and more efficient alternatives are available in nickel-metal hydride (Ni-MH) and lithium-ion technologies, which pack more energy and hold their charges longer in storage.

Some (not all) perform better in cold temperatures, others less so—check specifications carefully. A popular option is to use suitable rechargeables for the main batteries and lithium or alkaline batteries as spares.

5. FIRST-AID SUPPLIES

Carry and know how to use a first-aid kit, but do not let a first-aid kit give you a false sense of security. The best course of action is to always take the steps necessary to avoid injury or sickness in the first place.

Getting mountaineering-oriented first aid (MOFA) training or wilderness first responder (WFR) training is very worthwhile. Most first-aid training is aimed at situations in urban or industrial settings where trained personnel will respond quickly. In the back country, trained response may be hours—even days—away.

The first-aid kit should be compact and sturdy, with the contents wrapped in waterproof packaging. Commercial first-aid kits are widely available, though most are inadequate. At a minimum, a first-aid kit should include gauze pads in various sizes, roller gauze, small adhesive bandages, butterfly bandages, triangular bandages, battle dressing (or Carlisle bandage), adhesive tape, scissors, cleansers or soap, latex gloves, and paper and pencil.

Carry enough bandages and gauze to absorb a significant quantity of blood. Consider the length and nature of a particular trip in deciding whether to add to the basics of the first aid kit.

6. FIRE

Carry the means to start and sustain an emergency fire. Most hikers carry a butane lighter or two instead of matches in a waterproof container. Either must be absolutely reliable. Firestarters are indispensable for igniting wet wood quickly to make an emergency campfire.

Common firestarters include candles, chemical heat tabs, and canned heat. In areas where fires are not allowed, or where firewood is nonexistent, it is advisable to carry a stove as an additional emergency heat and water source.

7. REPAIR KIT AND TOOLS (INCLUDING KNIFE)

Knives are so useful in first aid, food preparation, and repairs that every party member needs to carry one. Leashes to prevent loss are common. Other tools (pliers, screwdriver, awl, scissors) can be part of a knife or pocket tool or can be carried separately—perhaps even as part of a group kit. Other useful repair items are shoelaces, safety pins, needle and thread, wire, duct tape, nylon fabric repair tape, cable ties, plastic buckles, cordage, webbing, and replacement parts for equipment such as tent, tent poles, stove, crampons, snowshoes, and skis.

8. NUTRITION (EXTRA FOOD)

For shorter trips, a one-day supply of extra food is a reasonable emergency stockpile in case foul weather, faulty navigation, injury, or other reasons delay the planned return. An expedition or long trek may require more.

The food should require no cooking, be easily digestible, and store well for long periods. A combination of jerky, nuts, candy, granola, and dried fruit works well. If a stove is carried, cocoa, dried soup, and tea can be added.

9. HYDRATION (EXTRA WATER)

Carry sufficient water and have the skills and tools required for obtaining and purifying additional water. Always carry at least one water bottle or collapsible water sack. Widemouthed containers are easier to refill.

An accessory pocket makes it possible to carry a water bottle on a pack hip-belt for easy access. Some water sacks (hydration bladders) designed to be stored in the pack feature a plastic hose and valve that allow drinking without slowing your pace.

Before starting on the trail, fill water containers from a reliable source, such as from a tap at home. In most environments you need to have the ability to treat—by filtering, using purification chemicals, or boiling—additional water that is encountered. In cold environments, a stove, fuel, pot, and lighter are needed to melt snow for additional water.

Daily water consumption varies greatly. Two quarts(liters) daily is a reasonable minimum; in hot weather or at high altitudes, 6 quarts may not be enough. In dry environments, carry even more water. Plan for enough water to accommodate additional requirements due to heat, cold, altitude, exertion, or emergency.

10. EMERGENCY SHELTER

If the party is not carrying a tent, carry some sort of extra shelter (in addition to a rain shell) from rain and wind, such as a plastic tube tent or a jumbo plastic trash bag. Another possibility is a reflective emergency blanket, which can also be used in administering first aid to an injured or hypothermic person.

Even on day trips, some hikers carry a bivy sack as part of their survival gear, and they partially compensate for the extra weight by going a little lighter on their insulating clothing layers. Others rely on their regular gear. A bivy sack protects insulating clothing layers from the weather, minimizes the effects of wind, and traps much of the heat escaping from your body inside its cocoon.

OTHER IMPORTANT ITEMS

There are, of course, many items in addition to the Ten Essentials that are useful for hiking. Every hiker has a personal opinion about what items are necessary. With experience, all hikers develop their own preferences. However, regardless of the “essentials” an individual hiker selects or does not select, it is always essential to

engage the brain while in the wilderness. Think ahead. Take time periodically to envision scenarios of possible accidents and unexpected circumstances. What would you do in those situations? What equipment would be necessary in order to be prepared? What risks are you willing to accept?

INSECT REPELLENT

The wilderness is an occasional home for people, but it is the permanent habitat of insects and other arthropod pests. Some of them—mosquitoes, biting flies, nosee-um gnats, blackflies, ticks, chiggers—want to feast on the human body. For winter trips, insect repellent may be unnecessary; for a low-elevation summer approach, thwarting mosquitoes may be essential.

One way to protect yourself from voracious insects is with heavy clothing, including gloves and head nets in really buggy areas. In hot weather, long shirts and pants made of netting may prove worthwhile. If it is too hot to wear much clothing, insect repellents are a good alternative.

Repellents with N,N-diethyl-metatoluamide (DEET) claim to be effective against all the principal biting insects but really perform best against mosquitoes. One application of a repellent with a high concentration of DEET will keep mosquitoes from biting for several hours, though they will still hover about annoyingly.

Mosquito repellents come in liquid, cream, spray, and stick form and are available in various strengths. Be aware that DEET is a potent toxin. It can also dissolve plastics and synthetic fabrics. There are less-toxic alternatives such as citronella and even clothing made of fabrics containing pyrethrins, which are natural insecticides extracted from chrysanthemum, but test these alternatives out first and make sure they work for you. In many situations, DEET is the only effective solution.

DEET is not very effective at repelling biting flies. Products with ethyl-hexanediol and dimethyl phthalate are much more effective against blackflies, deer flies, and gnats. Unfortunately, fly repellents do not do much to ward off mosquitoes. Ticks are a potential health hazard because they can carry Lyme disease, Rocky Mountain spotted fever, or other diseases. In tick country, especially when thrashing through brush, check your clothing and hair frequently during the day, and give your clothes and body a thorough inspection at night.

SIGNALING DEVICES

Whistles, avalanche transceivers, radios, and cell phones may be lifesavers in some situations but useless in others. Because all signal devices are unreliable or ineffectual under certain circumstances, they should never be carried with absolute faith that they

will actually transmit an emergency message. Bring signaling devices on a hike if it is decided that they are worth the burden of carrying them, but never depend on them to get the party out of a jam. Successful hikers prepare for the wilderness and act safely to minimize the chance they will ever need to send an emergency signal.

Whistle. Though limited in its scope, a whistle is probably the most reliable signaling device that can be carried. A whistle's shrill, penetrating blast greatly exceeds the range of the human voice and can serve as a crude means of communication in situations in which shouts for help cannot be heard—such as being trapped or becoming separated from the party in fog, darkness, or thick forest. Whistles prove much more useful if a party designates certain signals before the trip, such as one sound of the whistle for “Where are you?”; two for “I’m here and OK”; and three for “Help!”

Handheld radio. Handheld radios can greatly ease communication between a party, and they could save critical hours in getting help for an injured person. A handheld radio may be worth its weight on some hikes. Ranger stations or logging operations may monitor specific channels, although their policies vary from region to region. Radios are by no means foolproof; their range is limited, and in rugged terrain a peak or ridge can easily block transmission.

Wireless telephone (cell phone). Cell (or mobile) phones have become common, and they can dramatically shorten the time it takes to summon rescuers. They are also useful for telling people back home that the party will be late but is not in trouble and thus can forestall unnecessary rescue efforts. Understanding the limits of cell phones (and the availability of rescue) is as important as understanding their usefulness: the batteries can deplete; cell phones are unable to transmit or receive in many backcountry locations; a rescue may not be possible due to weather conditions or availability of rescuers. Cell phones should be viewed as an adjunct to, not a substitute for, self-reliance. No party should set out ill prepared, inadequately equipped, or attempting a route beyond the ability of its members with the notion that they can just call for help if needed. They will imperil themselves and the rescuers who may try to bail them out.