

# Emergency



# Survival Guide

## 72 Hour Kit Contents

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**"A prudent man foresees the difficulties ahead and prepares for them; the simpleton goes blindly on and suffers the consequences."**

**- Proverbs 22:3**

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## Fishing Kit Contents:

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- B. \_\_\_\_\_
- C. \_\_\_\_\_
- D. \_\_\_\_\_
- \* Items Marked in RED**
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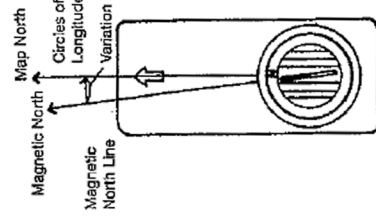
## Geographical North (Map North), Magnetic North and Variation (Declination)

Ordinarily we use the words "North", "South", etc. unconcernedly; however, we must realize there are two kinds of North, i.e. Geographical North and Magnetic North.

Geographical North is established geographically and it is common to all over the world. The circles of longitude of a map are drawn in correlation to the geographical poles and the lines show the direction of the Geographical North. The direction of these lines is different from the direction that the magnetic needle points to. On an ordinary map upside is the direction of the Geographical North and downside is the Geographical South. Accordingly, right side and left side are East and West respectively. The magnetic poles are close to the geographical poles, but are not coincidental. The angle between the straight lines pointing from the place of observation to the geographical and magnetic North poles is called Variation or Declination of the places. Figure 1.

The variation differs from place to place in the world. The lines of equal variation are very irregular, however; topographical maps of each place give the local variation. When you say a direction and such degrees, you must either subtract or add the local variation depending on which side of zero declination you are on for getting the geographically correct degree for the direction. For obtaining the true bearing read the "bearing" on your compass and if the local variation is Western, subtract the variation from the reading, if it is Eastern, add it to the reading. However, it is more practical for you to use the bearing you get when you set the Magnetic North as 0°.

Figure 1



## How to Maintain the Direction of an Object

Suppose you can see and object, say, a lake. If you can see the lake all the way while you are walking, there is no problem. However, on the way to the lake you may have to go through such a place as woods, hollows, etc. from where you cannot see the lake. In such case you may lose direction of the lake and your compass becomes very useful.

Figure 2

1. Before you start walking hold your compass as level as possible and point the arrow on the scale to the direction of the lake.
2. Turn the rotating ring and put the N (0°) in the direction of the N end (the luminous end) of the magnetic needle.
3. Read the bearing at the index line. This is the bearing of the lake and simply keep this bearing until you reach a place from where you can clearly see the lake again.

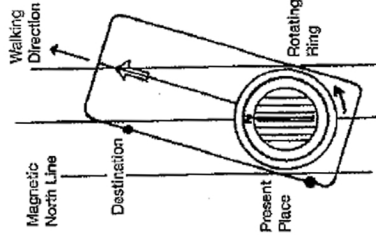
For instance, in Figure 2 the direction of the object is 320° (for expressing it exactly you must adjust the local variation as explained formerly. However, as long as you understand the meaning of variation you can say the direction of the object is 320° from the magnetic North).

## How to reach the Destination shown on Map

For going to the destination shown on a map merely find the present place, direction of the destination and the magnetic North.

1. First of all spread the map and draw directional lines of magnetic North according to the variation given on the map. For drawing lines use the sides of the compass. For instance, if the variation of the place is 5° Western, subtract 5° from 360° and set the bearing graduation 355° to the index line. Then make the arrows in the compass capsule parallel to the North-South line of the map (longitude line or up-down frame lines of the map) without moving the rotating ring and draw a line as shown in Figure 3. It is quite advisable for you to draw several lines parallel to the first magnetic North line you just drew by using the co-ordinate lines.
2. Find the present place and the destination on your map and draw a straight line between these two places on the map. Place your compass on the line so as to point the index line (arrow mark) to the destination.

Figure 4



Then turn the rotating ring and make the arrows in the compass capsule parallel to the magnetic North lines you drew in step 1. (At this stage you do not have to mind the position of the magnetic needle). Next, hold your compass and turn yourself slowly until the North end (the luminous end) of the magnetic needle becomes parallel to the arrows in the compass capsule. Figure 4. Now proceed toward the direction the arrow of the travel line points to by keeping the magnetic needle parallel to the arrows of the compass capsule. Simply keep going to this direction until you reach your destination. When you arrive at the first destination repeat the same procedure for going to your final destination. While you are proceeding toward the destination you have to make sure of the direction by looking at your compass and go as straight as possible. If the deviation to right or left from the correct course is large, the error at your goal becomes large.

## Finding your Location on the Map

Locate yourself on a high point from where any two distinctive features of the landscape are visible. The two distinctive features must be shown on the map. Suppose you can see a mountain A on the left and a lake B on the right side. Point the index line (arrow) toward the mountain A. Then rotate the rotating ring and set "N" of the dial to the North end of the compass needle. Place compass on the map and adjust the map so that the magnetic North line on the map becomes parallel to the magnetic needle and the N-S lines in the compass capsule. By keeping the state slide the compass on the map until one side of the scale points to the mountain A on the map and draw a line, Figure 5. Then, turn yourself to the lake B and repeat the same procedure and draw a line. The point of intersection of these two straight lines is your present location on the map, Figure 6.

Figure 5

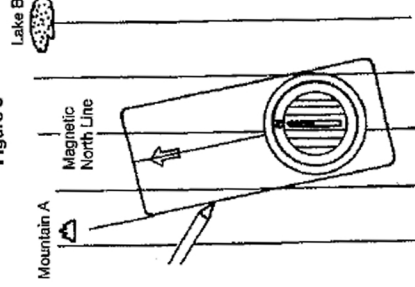
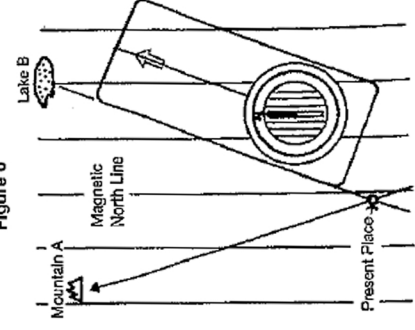


Figure 6



Many books on compass reading and orienteering are in print. We recommend reading them and/or taking a course to refine your compass and map reading skills.



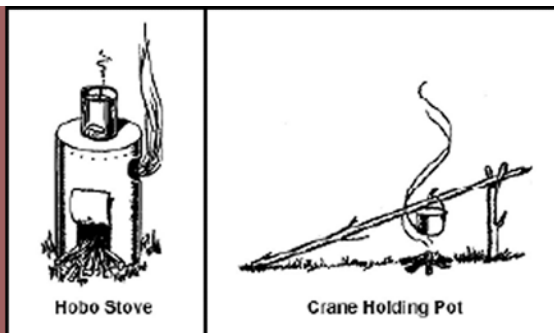


Fig 7-6



## Fire-Plow

The fire-plow (Figure 7-7) is a friction method of ignition. To use this method, cut a straight groove in a softwood base and plow the blunt tip of a hardwood shaft up and down the groove. The plowing action of the shaft pushes out small particles of wood fibers.

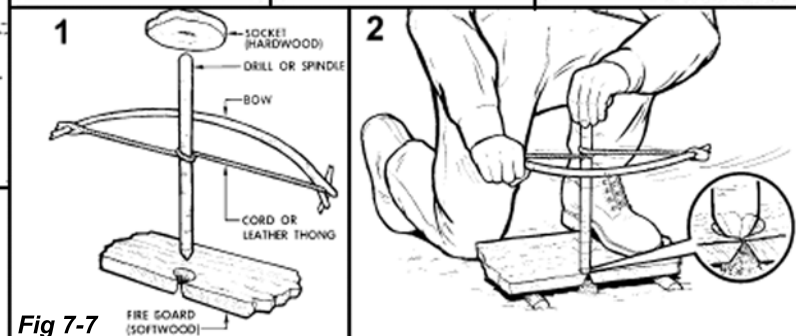
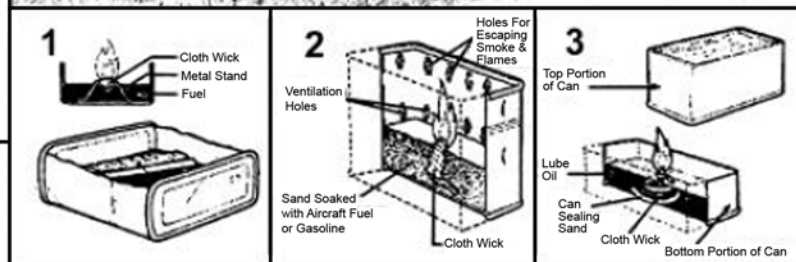
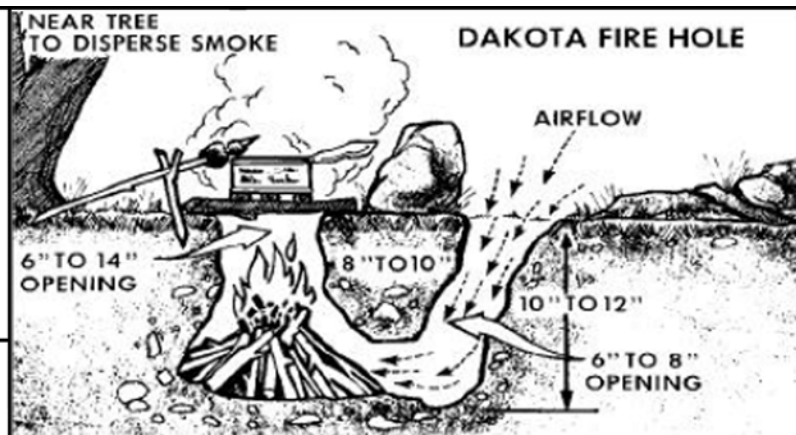
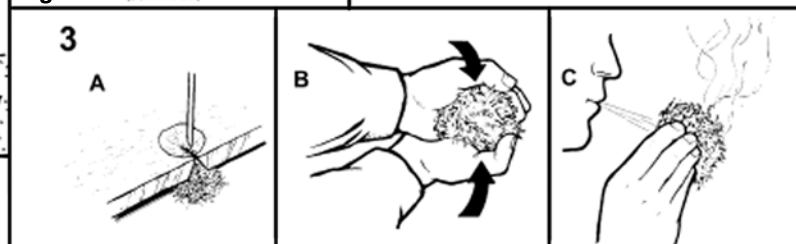


Fig 7-7



Then, as you apply more pressure on each stroke, the friction ignites the wood particles.

## Convex Lens

Use this method (Figure 7-6) only on bright, sunny days. The lens can come from binoculars, a camera, telescopic sights, or magnifying glasses. Angle the lens to concentrate the sun's rays on the tinder. Hold the lens over the same spot until the tinder begins to smolder. Gently blow or fan the tinder into a flame and apply it to the fire lay.

## Metal Match

Place a flat, dry leaf under your tinder with a portion exposed. Place the tip of the metal match on the dry leaf, holding the metal match in one hand and a knife in the other. Scrape your knife against the metal match to produce sparks. The sparks will hit the tinder. When the tinder starts to smolder, proceed as above.

## Battery

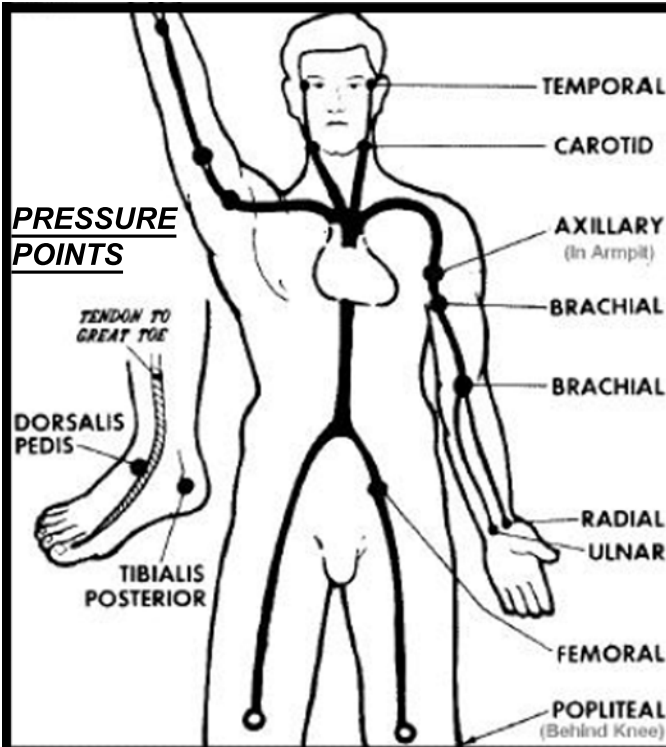
Use a battery to generate a spark. Use of this method depends on the type of battery available. Attach a wire to each terminal. Touch the ends of the bare wires together next to the tinder so the sparks will ignite it.

## Gunpowder

Often, you will have ammunition with your equipment. If so, carefully extract the bullet from the shell casing by moving the bullet back and forth. Use the gunpowder as tinder. Discard the casing and primers. A spark will ignite the powder.

## Flint and Steel

The direct spark method is the easiest of the primitive methods to use. The flint and steel method is the most reliable of the direct spark methods. Strike a flint or other hard, sharp-edged rock with a piece of carbon steel (stainless steel will not produce a good spark). This method requires a loose-jointed wrist and practice. When the tinder catches a spark, blow on it. The spark will spread and burst into flames.



## PRESSURE POINTS

## PRESSURE BANDAGE



WOUND



DRESSING

ATTACHED BANDAGES



PRESSURE APPLIED TO WOUND WITH BANDAGES ATTACHED TO DRESSING



ADDITIONAL PRESSURE APPLIED TO WOUND WITH HAND



ADDITIONAL PRESSURE APPLIED TO WOUND WITH PAD (RAG) FIRMLY SECURE WITH CRAVAT OR OTHER STRIP OF MATERIAL

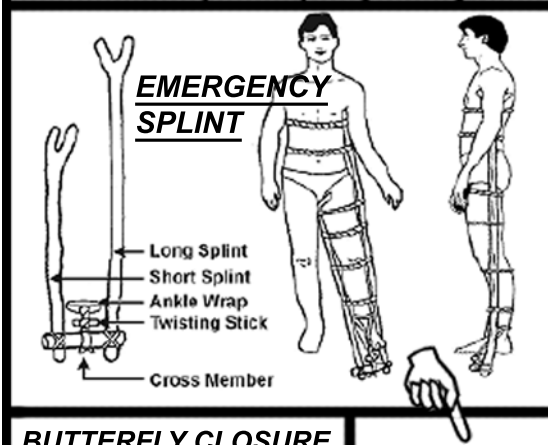
## Digital Ligation

4-48. You can stop major bleeding immediately or slow it down by applying pressure with a finger or two on the bleeding end of the vein or artery. Maintain the pressure until the bleeding stops or slows down enough to apply a pressure bandage, elevation, and so forth.

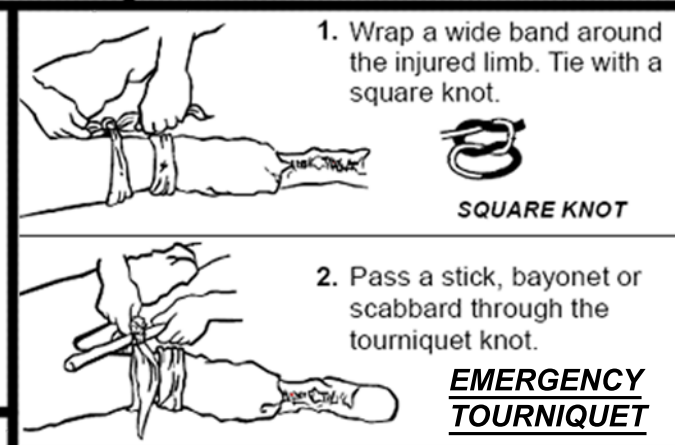
## Tourniquet

4-49. Use a tourniquet only when direct pressure over the bleeding point and all other methods did not control the bleeding. If you leave a tourniquet in place too long, the damage to the tissues can progress to gangrene, with a loss of the limb later. An improperly applied tourniquet can also cause permanent damage to nerves and other tissues at the site of the constriction. If you must use a tourniquet, place it around the extremity, between the wound and the heart, 5 to 10 centimeters (2 to 4 inches) above the wound site. Never place it directly over the wound or a fracture. Figure 4-4 explains how to apply a tourniquet.

4-50. After you secure the tourniquet, clean and bandage the wound. A lone survivor does not remove or release an applied tourniquet. However, in a buddy system, the buddy can release the tourniquet pressure every 10 to 15 minutes for 1 or 2 minutes to let blood flow to the rest of the extremity to prevent limb loss.



## EMERGENCY SPLINT



1. Wrap a wide band around the injured limb. Tie with a square knot.



SQUARE KNOT

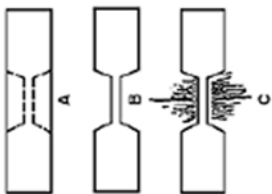
2. Pass a stick, bayonet or scabbard through the tourniquet knot.

## EMERGENCY TOURNIQUET

3. Tighten tourniquet by turning stick just enough to stop arterial bleeding.

4. Bind free end of the stick to keep tourniquet from unwinding.

## BUTTERFLY CLOSURE



- Get two forked branches or saplings at least 5 centimeters (2 inches) in diameter. Measure one from the patient's armpit to 20 to 30 centimeters (8 to 12 inches) past his unbroken leg.
- Measure the other from the groin to 20 to 30 centimeters (8 to 12 inches) past the unbroken leg. Ensure that both extend an equal distance beyond the end of the leg.
- Pad the two splints. Notch the ends without forks and lash a 20- to 30-centimeter (8- to 12-inch) cross member made from a 5-centimeter (2-inch) diameter branch between them.
- Using available material (vines, cloth, rawhide), tie the splint around the upper portion of the body and down the length of the broken leg. Follow the splinting guidelines.
- With available material, fashion a wrap that will extend around the ankle, with the two free ends tied to the cross member.
- Place a 4- by 1-inch stick in the middle of the free ends of the ankle wrap between the cross member and the foot. Using the stick, twist the material to make the traction easier.
- Continue twisting until the broken leg is as long or slightly longer than the unbroken leg.
- Lash the stick to maintain traction.

**NOTE:** Over time, you may lose traction because the material weakened. Check the traction periodically. If you must change/repair the splint, maintain the traction manually for a short time



## BONE AND JOINT INJURY

4-52. You could face bone and joint injuries that include fractures, dislocations, and sprains. Follow the steps explained below for each injury.

### FRACTURES

4-53. There are basically two types of fractures: open and closed. With an open (or compound) fracture, the bone protrudes through the skin and complicates the actual fracture with an open wound.

Any bone protruding from the wound should be cleaned with an antiseptic and kept moist. You should splint the injured area and continually monitor blood flow past the injury. Only reposition the break if there is no blood flow.

4-54. The closed fracture has no open wounds. Follow the guidelines for immobilization and splint the fracture.

4-55. The signs and symptoms of a fracture are pain, tenderness, discoloration, swelling deformity, loss of function, and grating (a sound or feeling that occurs when broken bone ends rub together).

4-56. The dangers with a fracture are the severing or the compression of a nerve or blood vessel at the site of fracture. For this reason minimum manipulation should be done, and only very cautiously. If you notice the area below the break becoming numb, swollen, cool to the touch, or turning pale, and the victim showing signs of shock, a major vessel may have been severed. You must control this internal bleeding.

Reset the fracture and treat the victim for shock and replace lost fluids.

4-57. Often you must maintain traction during the splinting and healing process. You can effectively pull smaller bones such as the arm or lower leg by hand. You can create traction by wedging a hand or foot in the V-notch of a tree and pushing against the tree with the other extremity. You can then splint the break.

4-58. Very strong muscles hold a broken thighbone (femur) in place making it difficult to maintain traction during healing. You can make an improvised traction splint using natural material (Figure 4-6) as explained on page 1.

### OPEN WOUNDS

4-90. Open wounds are serious in a survival situation, not only because of tissue damage and blood loss, but also because they may become infected. Bacteria on the object that made the wound, on the individual's skin and clothing, or on other foreign material or dirt that touches the wound may cause infection.

4-91. By taking proper care of the wound you can reduce further contamination and promote healing.

Clean the wound as soon as possible after it occurs by—

- **Removing or cutting clothing away from the wound.**
- **Always looking for an exit wound if a sharp object, gunshot, or projectile caused a wound.**
- **Thoroughly cleaning the skin around the wound.**
- **Rinsing (not scrubbing) the wound with large amounts of water under pressure. You can use fresh urine if water is not available.**

4-92. The "open treatment" method is the safest way to manage wounds in survival situations. Do not try to close any wound by suturing or similar procedures. Leave the wound open to allow the drainage of any pus resulting from infection. As long as the wound can drain, it generally will not become lifethreatening, regardless of how unpleasant it looks or smells.

4-93. Cover the wound with a clean dressing. Place a bandage on the dressing to hold it in place. Change the dressing daily to check for infection.

4-94. If a wound is gaping, you can bring the edges together with adhesive tape cut in the form of a "butterfly" or "dumbbell" (Figure 4-7). Use this method with extreme caution in the absence of antibiotics. You must always allow for proper drainage of the wound to avoid infection.

### Butterfly Closure

4-95. In a survival situation, some degree of wound infection is almost inevitable. Pain, swelling, and redness around the wound, increased temperature, and pus in the wound or on the dressing indicate infection is present.

4-96. If the wound becomes infected, you should treat as follows:

- **Place a warm, moist compress directly on the infected wound. Change the compress when it cools, keeping a warm compress on the wound for a total of 30 minutes. Apply the compresses three or four times daily.**
- **Drain the wound. Open and gently probe the infected wound with a sterile instrument.**
- **Dress and bandage the wound.**
- **Drink a lot of water.**
- **In the event of gunshot or other serious wounds, it may be better to rinse the wound out vigorously every day with the cleanest water available. If drinking water or methods to purify drinking water are limited, do not use your drinking water. Flush the wound forcefully daily until the wound is healed over. Your scar may be larger but your chances of infection are greatly reduced.**
- **Continue this treatment daily until all signs of infection have disappeared.**

4-97. If you do not have antibiotics and the wound has become severely infected, does not heal, and ordinary debridement is

impossible, consider maggot therapy as stated below, despite its hazards:

- **Expose the wound to flies for one day and then cover it.**
- **Check daily for maggots.**
- **Once maggots develop, keep wound covered but check daily.**
- **Remove all maggots when they have cleaned out all dead tissue and before they start on healthy tissue. Increased pain and bright red blood in the wound indicate that the maggots have reached healthy tissue.**
- **Flush the wound repeatedly with sterile water or fresh urine to remove the maggots.**
- **Check the wound every 4 hours for several days to ensure all maggots have been removed.**
- **Bandage the wound and treat it as any other wound. It should heal normally.**

### BURNS

4-104. The following field treatment for burns relieves the pain somewhat, seems to help speed healing, and offers some protection against infection:

- **First, stop the burning process. Put out the fire by removing clothing, dousing with water or sand, or by rolling on the ground. Cool the burning skin with ice or water. For burns caused by white phosphorous, pick out the white phosphorous with tweezers; do not douse with water.**
- **Soak dressings or clean rags for 10 minutes in a boiling tannic acid solution (obtained from tea, inner bark of hardwood trees, or acorns boiled in water).**
- **Cool the dressings or clean rags and apply over burns. Sugar and honey also work for burns with honey being especially effective at promoting new skin growth and stopping infections. Use both as you would in an open wound above.**
- **Treat as an open wound.**
- **Replace fluid loss. Fluid replacement can be achieved through oral (preferred) and intravenous routes (when resources are available). One alternate method through which rehydration can be achieved is through the rectal route. Fluids do not need to be sterile, only purified. A person can effectively absorb approximately 1 to 1.5 liters per hour by using a tube to deliver fluids into the rectal vault.**
- **Maintain airway.**
- **Treat for shock.**
- **Consider using morphine, unless the burns are near the face.**

### HEATSTROKE

4-106. The breakdown of the body's heat regulatory system (body temperature more than 40.5 degrees C [105 degrees F]) causes a heatstroke. Other heat injuries, such as cramps or dehydration, do not always precede a heatstroke. Signs and symptoms of heatstroke are—

- **Swollen, beet-red face.**
- **Reddened whites of eyes.**
- **Victim not sweating.**
- **Unconsciousness or delirium, which can cause pallor, a bluish**

**color to lips and nail beds (cyanosis), and cool skin.**

**NOTE:** By this time, the victim is in severe shock. Cool the victim as rapidly as possible. Cool him by dipping him in a cool stream. If one is not available, douse the victim with urine, water, or at the very least, apply cool wet compresses to all the joints, especially the neck, armpits, and crotch. Be sure to wet the victim's head. Heat loss through the scalp is great. Administer IVs and provide drinking fluids. You may fan the individual.

4-107. You can expect the following symptoms during cooling:

- Vomiting.
- Diarrhea.
- Struggling.
- Shivering.
- Shouting.
- Prolonged unconsciousness.
- Rebound heatstroke within 48 hours.
- Cardiac arrest; be ready to perform CPR.

**NOTE:** Treat for dehydration with lightly salted water.

### CHILBLAINS

4-108. Frostnip begins as firm, cold and white or gray areas on the face, ears, and extremities that can blister or peel just like sunburn as late as 2 to 3 days after the injury. Frostnip, or chilblains as it is sometimes called, is the result of tissue exposure to freezing temperatures and is the beginning of frostbite. The water in and around the cells freezes, rupturing cell walls and thus damaging the tissue. Warming the affected area with hands or a warm object treats this injury. Wind chill plays a factor in this injury; preventative measures include layers of dry clothing and protection against wetness and wind.

### TRENCH FOOT

4-109. Immersion or trench foot results from many hours or days of exposure to wet or damp conditions at a temperature just above freezing. The nerves and muscles sustain the main damage, but gangrene can occur. In extreme cases the flesh dies and it may become necessary to have the foot or leg amputated. The best prevention is to keep your feet dry. Carry extra socks with you in a waterproof packet. Dry wet socks against your body. Wash your feet daily and put on dry socks.

### FROSTBITE

4-110. This injury results from frozen tissues. Frostbite extends to a depth below the skin. The tissues become solid and immovable. Your feet, hands, and exposed facial areas are particularly vulnerable to frostbite.

4-111. When with others, prevent frostbite by using the buddy system. Check your buddy's face often and make sure that he checks yours. If you are alone, periodically cover your nose and lower part of your face with your mittens.

4-112. Do not try to thaw the affected areas by placing them close to an open flame. Frostbitten tissue may be immersed in 37 to 42 degrees C (99 to 109 degrees F) water until thawed. (Water temperature can be determined with the inside wrist or baby formula method.) Dry the part and place it next to your skin to warm it at body temperature.

### HYPOTHERMIA

4-113. It is defined as the body's failure to maintain an inner core temperature of 36 degrees C (97 degrees

F). Exposure to cool or cold temperature over a short or long time can cause hypothermia. Dehydration and lack of food and rest predispose the survivor to hypothermia.

4-114. Immediate treatment is the key. Move the victim to the best shelter possible away from the wind, rain, and cold. Remove all wet clothes and get the victim into dry clothing. Replace lost fluids with warm fluids, and warm him in a sleeping bag using two people (if possible) providing skin-to-skin contact. If the victim is unable to drink warm fluids, rectal rehydration may be used.

### INTESTINAL PARASITES

4-116. You can usually avoid worm infestations and other intestinal parasites if you take preventive measures. For example, never go barefoot.

The most effective way to prevent intestinal parasites is to avoid uncooked meat, never eat raw vegetables contaminated by raw sewage, and try not to use human waste as a fertilizer. However, should you become infested and lack proper medicine, you can use home remedies. Keep in mind that these home remedies work on the principle of changing the environment of the gastrointestinal tract.

The following are home remedies you could use:

• **Salt water.** Dissolve 4 tablespoons of salt in 1 liter of water and drink. Do not repeat this treatment.

• **Tobacco.** Eat 1 to 1 1/2 cigarettes or approximately 1 teaspoon (pinch) of smokeless tobacco. The nicotine in the tobacco will kill or stun the worms long enough for your system to pass them. If the infestation is severe, repeat the treatment in 24 to 48 hours, but no sooner.

• **Kerosene.** Drink 2 tablespoons of kerosene, but no more. If necessary, you can repeat this treatment in 24 to 48 hours. Be careful not to inhale the fumes. They may cause lung irritation.

**NOTE:** Tobacco and kerosene treatment techniques are very dangerous, be careful.

• **Hot peppers.** Peppers are effective only if they are a steady part of your diet. You can eat them raw or put them in soups or rice and meat dishes. They create an environment that is prohibitive to parasitic attachment.

• **Garlic.** Chop or crush 4 cloves, mix with 1 glass of liquid, and drink daily for 3 weeks.

### BITES AND STINGS

4-66. Insects and related pests are hazards in a survival situation. They not only cause irritations, but they are often carriers of diseases that cause severe allergic reactions in some individuals. In many parts of the world you will be exposed to serious, even fatal, diseases not encountered in the United States.

- Ticks can carry and transmit diseases, such as Rocky Mountain spotted fever common in many parts of the United States. Ticks also transmit Lyme disease.
- Mosquitoes may carry malaria, dengue, and many other diseases.

- Flies can spread disease from contact with infectious sources. They are causes of sleeping sickness, typhoid, cholera, and dysentery.
- Fleas can transmit plague.
- Lice can transmit typhus and relapsing fever.

4-67. The best way to avoid the complications of insect bites and stings is to keep immunizations (including booster shots) up-to-date, avoid insect-infested areas, use netting and insect repellent, and wear all clothing properly.

4-68. If you are bitten or stung, do not scratch the bite or sting; it might become infected. Inspect your body at least once a day to ensure there are no insects attached to you. If you find ticks attached to your body, cover them with a substance (such as petroleum jelly, heavy oil, or tree sap) that will cut off their air supply. Without air, the tick releases its hold, and you can remove it. Take care to remove the whole tick. Use tweezers if you have them. Grasp the tick where the mouthparts are attached to the skin. Do not squeeze the tick's body. Wash your hands after touching the tick. Clean the tick wound daily until healed.

### TREATMENT

4-69. It is impossible to list the treatment of all the different types of bites and stings. However, you can generally treat bites and stings as follows:

• **If antibiotics are available for your use, become familiar with them before deployment and use them.**

• **Predeployment immunizations can prevent most of the common diseases carried by mosquitoes and some carried by flies.**

• **The common fly-borne diseases are usually treatable with penicilins or erythromycin.**

• **Most tick-, flea-, louse-, and mite-borne diseases are treatable with tetracycline.**

• **Most antibiotics come in 250 milligram (mg) or 500 mg tablets. If you cannot remember the exact dose rate to treat a disease, 2 tablets, 4 times a day, for 10 to 14 days will usually kill any bacteria.**

### PERSONAL HYGIENE

4-20. In any situation, cleanliness is an important factor in preventing infection and disease. It becomes even more important in a survival situation. Poor hygiene can reduce your chances of survival.

4-21. A daily shower with hot water and soap is ideal, but you can stay clean without this luxury. Use a cloth and soapy water to wash yourself. Pay special attention to the feet, armpits, crotch, hands, and hair as these are prime areas for infestation and infection. If water is scarce, take an "air" bath. Remove as much of your clothing as practical and expose your body to the sun and air for at least 1 hour. Be careful not to sunburn.

4-22. If you don't have soap, use ashes or sand, or make soap from animal fat and wood ashes if your situation allows.



To make soap—

- Extract grease from animal fat by cutting the fat into small pieces and cooking it in a pot.
- Add enough water to the pot to keep the fat from sticking as it cooks.
- Cook the fat slowly, stirring frequently.
- After the fat is rendered, pour the grease into a container to harden.
- Place ashes in a container with a spout near the bottom.
- Pour water over the ashes and collect the liquid that drips out of the spout in a separate container. This liquid is the potash or lye.

4-23. Another way to get the lye is to pour the slurry (the mixture of ashes and water) through a straining cloth.

- In a cooking pot, mix two parts grease to one part lye.
- Place this mixture over a fire and boil it until it thickens.

After the mixture (the soap) cools, you can use it in the semiliquid state directly from the pot. You can also pour it into a pan, allow it to harden, and cut it into bars for later use.

### Keep Your Hands Clean

4-24. Germs on your hands can infect food and wounds. Wash your hands after handling any material that is likely to carry germs, after urinating or defecating, after caring for the sick, and before handling any food, food utensils, or drinking water. Keep your fingernails closely trimmed and clean, and keep your fingers out of your mouth.

### Keep Your Hair Clean

4-25. Your hair can become a haven for bacteria or fleas, lice, and other parasites. Keeping your hair clean, combed, and trimmed helps you avoid this danger.

### Keep Your Clothing Clean

4-26. Keep your clothing and bedding as clean as possible to reduce the chances of skin infection or parasitic infestation. Clean your outer clothing whenever it becomes soiled. Wear clean underclothing and socks each day. If water is scarce, "air" clean your clothing by shaking, airing, and sunning it for 2 hours. If you are using a sleeping bag, turn it inside out after each use, fluff it, and air it.

### Keep Your Teeth Clean

4-27. Thoroughly clean your mouth and teeth with a toothbrush at least once each day. If you don't have a toothbrush, make a chewing stick. Find a twig about 20 centimeters (cm) (8 inches) long and 1 centimeter (1/3 inch) wide. Chew one end of the stick to separate the fibers. Then brush your teeth thoroughly.

Another way is to wrap a clean strip of cloth around your fingers and rub your teeth with it to wipe away food particles. You can also brush your teeth with small amounts of sand, baking soda, salt, or soap. Rinse your mouth with water, salt water, or willow bark tea. Also, flossing your teeth with string or fiber helps

### oral hygiene.

4-28. If you have cavities, you can make temporary fillings by placing candle wax, tobacco, hot pepper, toothpaste or powder, or portions of a gingerroot into the cavity. Make sure you clean the cavity by rinsing or picking the particles out of the cavity before placing a filling in the cavity.

### Take Care of Your Feet

4-29. To prevent serious foot problems, break in your shoes before wearing them on any mission. Wash and massage your feet daily. Trim your toenails straight across. Wear an insole and the proper size of dry socks. Powder and check your feet daily for blisters.

4-30. If you get a small blister, do not open it. An intact blister is safe from infection. Apply a padding material around the blister to relieve pressure and reduce friction. If the blister bursts, treat it as an open wound. Clean and dress it daily and pad around it. Leave large blisters intact. To avoid having the blister burst or tear under pressure and cause a painful and open sore, do the following:

- Obtain a sewing-type needle and a clean or sterilized thread.
- Run the needle and thread through the blister after cleaning the blister.
- Detach the needle and leave both ends of the thread hanging out of the blister. The thread will absorb the liquid inside. This reduces the size of the hole and ensures that the hole does not close up.
- Pad around the blister.

### Get Sufficient Rest

4-31. You need a certain amount of rest to keep going. Plan for regular rest periods of at least 10 minutes per hour during your daily activities. Learn to make yourself comfortable under less-than-ideal conditions.

A change from mental to physical activity or vice versa can be refreshing when time or situation does not permit total relaxation.

### Keep Campsite Clean

4-32. Do not soil the ground in the campsite area with urine or feces. Use latrines, if available. When latrines are not available, dig "cat holes" and cover the waste. Collect drinking water upstream from the campsite. Purify all water.

### BEE AND WASP STINGS

4-70. If stung by a bee, immediately remove the stinger and venom sac, if attached, by scraping with a fingernail or a knife blade. Do not squeeze or grasp the stinger or venom sac, as squeezing will force more venom into the wound. Wash the sting site thoroughly with soap and water to lessen the chance of a secondary infection.

4-71. If you know or suspect that you are allergic to insect stings, always carry an insect sting kit with you.

4-72. Relieve the itching and discomfort caused by insect bites by applying :

- Cold compresses.
- A cooling paste of mud and ashes.
- Sap from dandelions.

- Coconut meat.
- Crushed cloves of garlic.
- Onion.

### SPIDER BITES AND SCORPION STINGS

4-73. The black widow spider is identified by a red hourglass on its abdomen. Only the female bites, and it has a neurotoxic venom. The initial pain is not severe, but severe local pain rapidly develops. The pain gradually spreads over the entire body and settles in the abdomen and legs. Abdominal cramps and progressive nausea, vomiting, and a rash may occur. Weakness, tremors, sweating, and salivation may occur. Anaphylactic reactions can occur. Symptoms may worsen for the next three days and then begin to subside for the next week. Treat for shock. Be ready to perform CPR. Clean and dress the bite area to reduce the risk of infection. An antivenin is available.

4-75. The brown recluse spider is a small, light brown spider identified by a dark brown violin on its back. There is no pain, or so little pain, that usually a victim is not aware of the bite. Within a few hours a painful red area with a mottled cyanotic center appears. Necrosis does not occur in all bites, but usually in 3 to 4 days, a star-shaped, firm area of deep purple discoloration appears at the bite site. The area turns dark and mummified in a week or two. The margins separate and the scab falls off, leaving an open ulcer. Secondary infection and regional swollen lymph glands usually become visible at this stage. The outstanding characteristic of the brown recluse bite is an ulcer that does not heal but persists for weeks or months. In addition to the ulcer, there is often a systemic reaction that is serious and may lead to death. Reactions (fever, chills, joint pain, vomiting, and a generalized rash) occur chiefly in children or debilitated persons.

4-77. Scorpions are all poisonous to a greater or lesser degree. There are two different reactions, depending on the species:

- **Severe local reaction only, with pain and swelling around the area of the sting. Possible prickly sensation around the mouth and a thick-feeling tongue.**
- **Severe systemic reaction, with little or no visible local reaction. Local pain may be present. Systemic reaction includes respiratory difficulties, thick-feeling tongue, body spasms, drooling, gastric distention, double vision, blindness, involuntary rapid movement of the eyeballs, involuntary urination and defecation, and heart failure. Death is rare, occurring mainly in children and adults with high blood pressure or illnesses.**

4-78. Treat scorpion stings as you would a black widow bite.

### Plant Medicine

#### a. Tannin.

(1) Medical uses. Burns, diarrhea, dysentery, skin problems, and parasites. Tannin solution prevents infection and aids healing.

(2) Sources. Found in the outer bark of all trees, acorns, banana plants, common plantain, strawberry leaves, and blackberry stems.

(3) Preparation.

- (a) Place crushed outer bark, acorns, or leaves in water.
- (b) Leach out the tannin by soaking or boiling.
  - **Increase tannin content by longer soaking time.**
  - **Replace depleted material with fresh bark/plants.**
- (4) Treatments.

- (a) Burns.
  - **Moisten bandage with cooled tannin tea.**
  - **Apply compress to burned area.**
  - **Pour cooled tea on burned areas to ease pain.**
- (b) Diarrhea, dysentery, and worms. Drink strong tea solution (may promote voiding of worms).

(c) Skin problems (dry rashes and fungal infections). Apply cool compresses or soak affected part to relieve itching and promote healing.

(d) Lice and insect bites. Wash affected areas with tea to ease itching.

#### **b. Salicin/salicylic acid.**

(1) Medical uses. Aches, colds, fever, inflammation, pain, sprains, and sore throat (aspirin-like qualities).

(2) Sources. Willow and aspen trees (Figure V-7).

(3) Preparation.

(a) Gather twigs, buds, or cambium layer (soft, moist layer between the outer bark and the wood) of willow or aspen.

(b) Prepare tea as described in paragraph 3a(3).

- (c) Make poultice.
  - **Crush the plant or stems.**
  - **Make a pulpy mass.**

(4) Treatments.

(a) Chew on twigs, buds, or cambium for symptom relief.

(b) Drink tea for colds and sore throat.

- (c) Use warm, moist poultice for aches and sprains.
  - **Apply pulpy mass over injury.**
  - **Hold in place with a dressing.**

#### **c. Common plantain.**

(1) Medical uses. Itching, wounds, abrasions, stings, diarrhea, and dysentery.

(2) Source. There are over 200 plantain species with similar medicinal properties.

(3) Preparation.

(a) Brew tea from seeds.

(b) Brew tea from leaves.

#### **(c) Make poultice of leaves.**

(4) Treatments.

(a) Drink tea made from seeds for diarrhea or dysentery.

(b) Drink tea made from leaves for vitamin and minerals.

(c) Use poultice to treat cuts, sores, burns, and stings.

(d). Papain.

(1) Medical uses. Digestive aid, meat tenderizer, and a food source.



**NARROWLEAF PLANTAIN**  
*Plantago lanceolata L.*  
PLANTAIN FAMILY



#### **DISLOCATIONS**

4-59. Dislocations are the separations of bone joints causing the bones to go out of proper alignment. These misalignments can be extremely painful and can cause an impairment of nerve or circulatory function below the area affected. You must place these joints back into alignment as quickly as possible.

4-60. Signs and symptoms of dislocations are joint pain, tenderness, swelling, discoloration, limited range of motion, and deformity of the joint. You treat dislocations by reduction, immobilization, and rehabilitation.

4-61. Reduction or "setting" is placing the bones back into their proper alignment. You can use several methods, but manual traction or the use of weights to pull the bones are the safest and easiest. Once performed, reduction decreases the victim's pain and allows for normal function and circulation. Without an X ray, you can judge proper alignment by the look and feel of the joint and by comparing it to the joint on the opposite side.

4-62. Immobilization is nothing more than splinting the dislocation after reduction. You can use any fieldexpedient material for a splint or you can splint an extremity to the body. The basic guidelines for splinting are as follows:

- **Splint above and below the fracture site.**

- **Pad splints to reduce discomfort.**

- **Check circulation below the fracture after making each tie on the splint.**

4-63 To rehabilitate the dislocation, remove the splints after 7 to 14 days. Gradually use the injured joint until fully healed.

#### **SPRAINS**

4-64. The accidental overstretching of a tendon or ligament causes sprains. The signs and symptoms are pain, swelling, tenderness, and discoloration (black and blue).

4-65. When treating sprains, you should follow the letters in RICE as defined below:

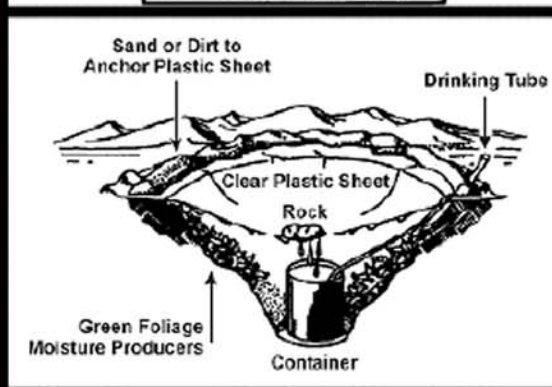
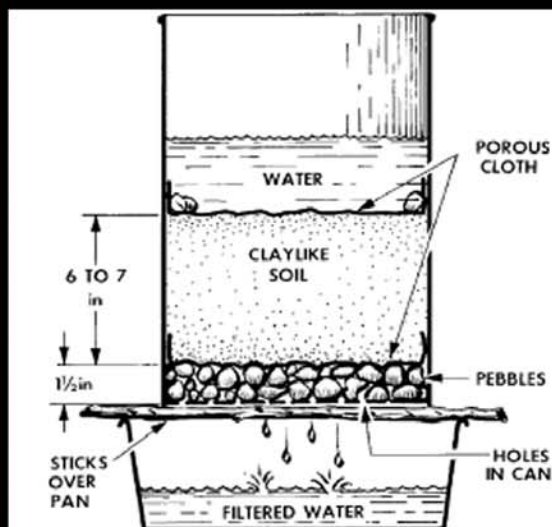
- **R-Rest injured area.**

- **I-Ice for 24 to 48 hours.**

- **C-Compression-wrap or splint to help stabilize. If possible, leave the boot on a sprained ankle unless circulation is compromised.**

- **E-Elevate the affected area.**





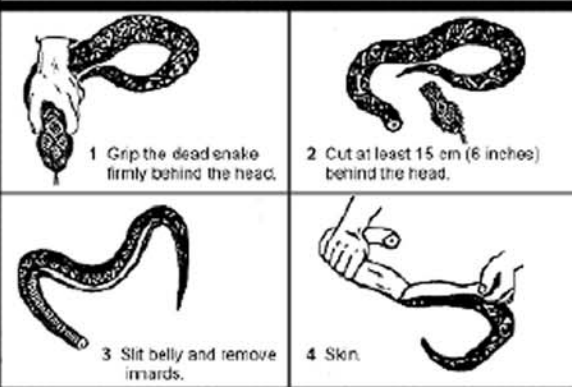
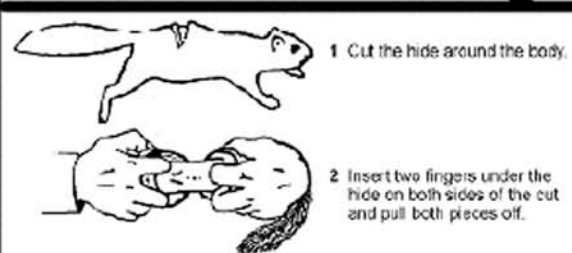
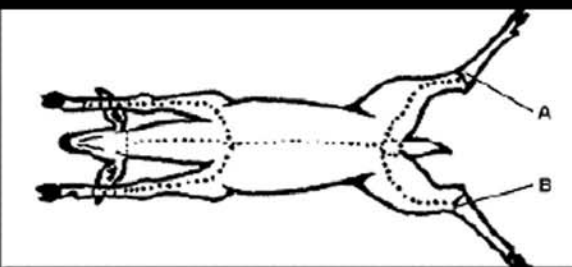
## Food Preparation

Animal food gives the greatest food value per pound.

## Butchering and skinning.

### Mammals.

- (a) Remove the skin and save for other uses.
- (a) One cut skinning of small game (Figure VIII-9).
- Open the abdominal cavity.
- Avoid rupturing the intestines.
- Remove the intestines.
- Save inner organs (heart, liver, and kidneys) and all meaty parts of the skull, brain, tongue, and eyes.
  - (b) Wash when ready to use.
  - (c) If preserving the meat, remove it from the bones.
  - (d) Unused or inedible organs and entrails may be used as bait for other game.



## Frogs and snakes

- (a) Skin.
- (b) Discard skin, head with 2 inches of body, and internal organs.

### Fish

- (a) Scale (if necessary) and gut fish soon after it is caught.
- (b) Insert knife point into anus of fish and cut open the belly.
- (c) Remove entrails.
- (d) Remove gills to prevent spoilage.
- (4) Birds.
  - (a) Gut soon after killing.
  - (b) Protect from flies.
  - (c) Skin or pluck them.
  - (d) Skin scavengers and sea birds.

### Insects.

- (a) Remove all hard portions such as the legs of grasshoppers or crickets. (*The rest is edible.*)
- (b) Recommend cooking grasshopper-size insects.

**CAUTION:** Dead insects spoil rapidly, DO NOT save.

## Plant Foods.

**Note:** If you cannot positively identify an edible plant and choose to try an unknown plant, these guidelines may help determine edibility.

### (1) Selection criteria.

- (a) Before testing for edibility, ensure there are enough plants to make testing worth your time and effort. Each part of a plant (roots, leaves, stems, bark, etc.) requires more than 24 hours to test. DO NOT waste time testing a plant that is not abundant.
- (b) Test only 1 part of 1 plant at a time.
- (c) Remember that eating large portions of plant food on an empty stomach may cause diarrhea, nausea, or cramps. Two good examples are green apples and wild onions. Even after testing food and finding it safe, eat in moderation.

### (2) Avoid plants with the following characteristics:

**Note:** Using these guidelines in selecting plants for food may eliminate some edible plants; however, these guidelines will help prevent choosing potentially toxic plants.

- (a) Milky sap (dandelion has milky sap but is safe to eat and easily recognizable).
- (b) Spines, fine hairs, and thorns (skin irritants/contact dermatitis). Prickly pear and thistles are exceptions. Bracken fern fiddleheads also violate this guideline.
- (c) Mushrooms and fungus.
- (d) Umbrella shaped flowers (hemlock is eliminated).
- (e) Bulbs (only onions smell like onions).
- (f) Grain heads with pink, purplish, or black spurs.
- (g) Beans, bulbs, or seeds inside pods.
- (h) Old or wilted leaves.
- (i) Plants with shiny leaves.
- (j) White and yellow berries. (Aggregate berries such as black and dewberries are always edible, test all others before eating.)
- (k) Almond scent in woody parts and leaves.

### (3) Test procedures.

**CAUTION:** Test all parts of the plant for edibility. Some plants have both edible and inedible parts. NEVER ASSUME a part that proved edible when cooked is edible raw, test the part raw before eating. The same part or plant may produce varying reactions in different individuals.

- (1) Test only 1 part of a plant at a time.
- (2) Separate the plant into its basic components (stems, roots, buds, and flowers).
- (3) Smell the food for strong acid odors. Remember, smell alone does not indicate a plant is edible or inedible.

(4) DO NOT eat 8 hours before the test and drink only purified water.

(5) During the 8 hours you abstain from eating, test for contact poisoning by placing a piece of the plant on the inside of your elbow or wrist. The sap or juice should contact the skin. Usually 15 minutes is enough time to allow for a reaction.

(6) During testing, take NOTHING by mouth EXCEPT purified water and the plant you are testing.

(7) Select a small portion of a single part and prepare it the way you plan to eat it.

(8) Before placing the prepared plant in your mouth, touch a small portion (a pinch) to the outer surface of your lip to test for burning or itching.

(9) If after 3 minutes there is no reaction on your lip, place the plant on your tongue and hold it for 15 minutes.

(10) If there is no reaction, thoroughly chew a pinch and hold it in your mouth for 15 minutes (DO NOT SWALLOW). If any ill effects occur, rinse out your mouth with water.

(11) If nothing abnormal occurs, swallow the food and wait 8 hours. If any ill effects occur during this period, induce vomiting and drink a water and charcoal mixture.

(12) If no ill effects occur, eat ¼ cup of the same plant prepared the same way. Wait another 8 hours. If no ill effects occur, the plant part as prepared is safe for eating.

## CAUTION:

1. Ripe tropical fruits should be peeled and eaten raw. Softness, rather than color, is the best indicator of ripeness. Cook unripe fruits and discard seeds and skin.

2. Cook underground portions when possible to reduce bacterial contamination and ease digestion of their generally high starch content.

3. During evasion, you may not be able to cook. Concentrate your efforts on leafy green plants, ripe fruits, and above ground ripe vegetables not requiring significant preparation.

## Water

Drink extra water. Minimum 2 quarts per day to maintain fluid level. Exertion, heat, injury, or an illness increases water loss.

**Note:** Pale yellow urine indicates adequate hydration.

## Water Procurement

a. DO NOT drink—

- (1) Urine.
- (2) Fish juices.
- (3) Blood.
- (4) Sea water.
- (5) Alcohol.
- (6) Melted water from new sea ice.

## Water sources:

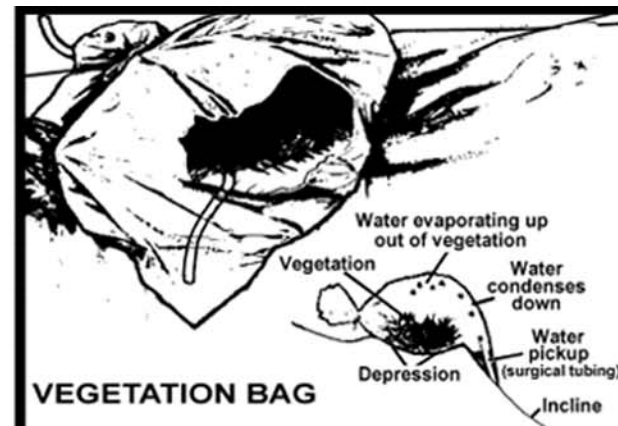
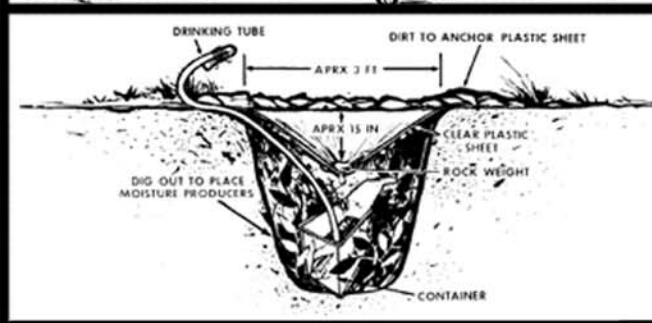
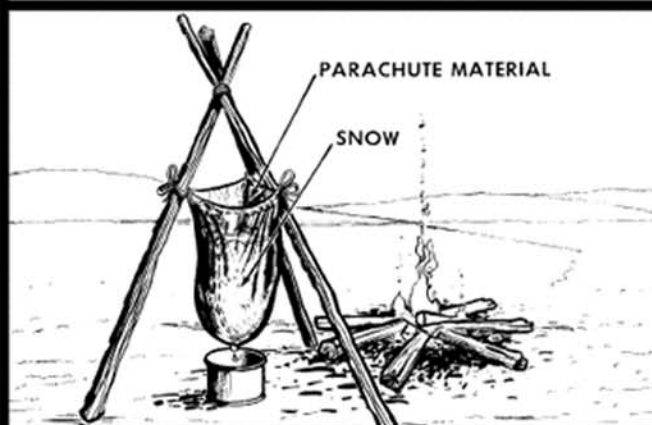
- (1) Surface water (streams, lakes, and springs).
- (2) Precipitation (rain, snow, dew, sleet)
- (3) Subsurface (wells and cisterns).
- (4) Ground water (when no surface water is available)

## Water Indicators

- (a) Abundance of lush green vegetation.
- (b) Drainages and low-lying areas.
- (c) "V" intersecting game trails often point to water.
- (d) Presence of swarming insects indicates water is near.
- (e) Bird flight in the early morning or late afternoon might indicate the direction to water.

## Snow or Ice.

- (a) DO NOT eat ice or snow:
  - Lowers body temperature.
  - Induces dehydration.
  - Causes minor cold injury to lips and mouth.
- (b) Melt with fire.
  - Stir frequently to prevent damaging container.
  - Speed the process by adding hot rocks or water.
- (c) Melt with body heat.
  - Use waterproof container.
  - Place between layers of clothing.
  - DO NOT place next to the skin.



## Water Preparation and Storage

### a. Filtration.

Filter through porous material (sand/charcoal).

### b. Purification.

- (1) Water from live plants requires no further treatment.
- (2) Purify all other water.
- (a) Boil at least 1 minute.
- (b) Pour from one container to another to improve taste to aerate.
- (c) Water purification tablets. Follow instructions on package.

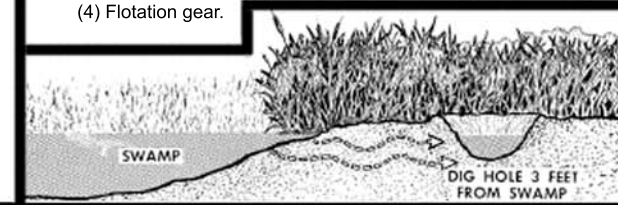
### c. Potable Water.

- (1) If water cannot be purified, obtain water from a clear, cold, clean, and fast running source (if possible).
- (2) Put in clear container and expose to the sun's ultraviolet rays to kill bacteria.

### d. Storage.

To prevent contamination, use a clean, covered or sealed container.

- (1) Trash bag.
- (2) Prophylactic.
- (3) Section of bamboo.
- (4) Flotation gear.







**Wild rose**  
*Rosa* species

**Description:** This shrub grows 60 centimeters to 2.5 meters (24 inches to 8 feet) high. It has alternate leaves and sharp prickles. Its flowers may be red, pink, or yellow. Its fruit, called rose hip, stays on the shrub year-round.

**Habitat and Distribution:** Look for wild roses in dry fields and open woods throughout the Northern Hemisphere.

**Edible Parts:** The flowers and buds are edible raw or boiled. In an emergency, you can peel and eat the young shoots. You can boil fresh, young leaves in water to make a tea. After the flower petals fall, eat the rose hips; the pulp is highly nutritious and an excellent source of vitamin C. Crush or grind dried rose hips to make flour.

## CAUTION

Eat only the outer portion of the fruit as the seeds of some species are quite prickly and can cause internal distress.



**Strawberry**  
*Fragaria* species

**Description:** Strawberry is a small plant with a three-leaved growth pattern. It has small, white flowers usually produced during the spring. Its fruit is red and fleshy.

**Habitat and Distribution:** Strawberries are found in the north temperate zone and also in the high mountains of the southern Western Hemisphere. Strawberries prefer open, sunny areas. They are commonly planted.

**Edible Parts:** The fruit is edible fresh, cooked, or dried. Strawberries are a good source of vitamin C. You can also eat the plant's leaves or dry them to make a tea. Care should be taken with strawberries and other farm foods that have similar, pitted skins. In areas where human fertilizer is used, even bleach will not be able to effectively remove all bacteria.

## WARNING

Eat only white-flowering true strawberries. Other similar plants without white flowers can be poisonous.



**Prickly pear cactus**  
*Opuntia* species

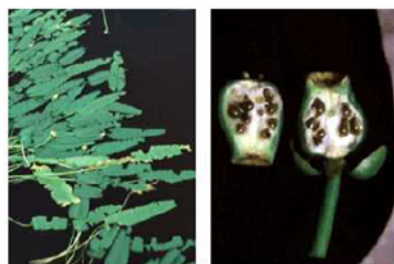
**Description:** This cactus has flat, padlike stems that are green. Many round, furry dots that contain sharp-pointed hairs cover these stems.

**Habitat and Distribution:** This cactus is found in arid and semiarid regions and in dry, sandy areas of wetter regions throughout most of the United States and Central and South America. Some species are planted in arid and semiarid regions of other parts of the world.

**Edible Parts:** All parts of the plant are edible. Peel the fruits and eat them fresh or crush them to prepare a refreshing drink. Avoid the tiny, pointed hairs. Roast the seeds and grind them to a flour.

## CAUTION

Avoid any plant that resembles the prickly pear cactus and has milky sap.

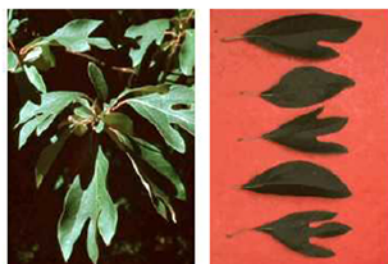


**Spatterdock or yellow water lily**  
*Nuphar* species

**Description:** This plant has leaves up to 60 centimeters (24 inches) long with a triangular notch at the base. The shape of the leaves is somewhat variable. The plant's yellow flowers are 2.5 centimeters (1 inch) across and develop into bottle-shaped fruits. The fruits are green when ripe.

**Habitat and Distribution:** These plants grow throughout most of North America. They are found in quiet, shallow (never deeper than 1.8 meters [6 feet]) freshwater.

**Edible Parts:** All parts of the plant are edible. The fruits contain several dark brown seeds you can parch or roast and then grind into flour. The large rootstock contains starch. Dig it out of the mud, peel off the outside, and boil the flesh. Sometimes the rootstock contains large quantities of a very bitter compound. Boiling the plant in several changes of water may remove the bitterness.



**Sassafras**  
*Sassafras albidum*

**Description:** This shrub or small tree bears different leaves on the same plant. Some leaves will have one lobe, some two lobes, and some no lobes. The flowers, which appear in early spring, are small and yellow. The fruits are dark blue. The plant parts have a characteristic root beer smell.

**Habitat and Distribution:** Sassafras grows at the margins of roads and forests, usually in open, sunny areas. It is a common tree throughout eastern North America.

**Edible Parts:** The young twigs and leaves are edible fresh or dried. You can add dried young twigs and leaves to soups. Dig the underground portion, peel off the bark, and let it dry. Then boil it in water to prepare sassafras tea.

**Other Uses:** Shred the tender twigs for use as a toothbrush.



**Plantain, broad and narrow leaf**  
*Plantago* species

**Description:** The broad leaf plantain has leaves over 2.5 centimeters (1 inch) across that grow close to the ground. The flowers are on a spike that rises from the middle of the cluster of leaves. The narrow leaf plantain has leaves up to 12 centimeters (5 inches) long and 2.5 centimeters (1 inch) wide, covered with hairs. The leaves form a rosette. The flowers are small and inconspicuous.

**Habitat and Distribution:** Look for these plants in lawns and along roads in the north temperate zone. This plant is a common weed throughout much of the world.

**Edible Parts:** The young tender leaves are edible raw. Older leaves should be cooked.



**Pine**  
*Pinus* species

**Description:** Pine trees are easily recognized by their needlelike leaves grouped in bundles. Each bundle may contain one to five needles, the number varying among species. The tree's odor and sticky sap provide a simple way to distinguish pines from similar looking trees with needlelike leaves.

**Habitat and Distribution:** Pines prefer open, sunny areas. They are found throughout North America, Central America, much of the Caribbean region, North Africa, the Middle East, Europe, and some places in Asia.

**Edible Parts:** The seeds of all species are edible. You can collect the young male cones, which grow only in the spring, as a survival food. Boil or bake the young cones. The bark of young twigs is edible. Peel off the bark of thin twigs. You can chew the juicy inner bark; it is rich in sugar and vitamins. Eat the seeds raw or cooked. Green pine needle tea is high in vitamin C.



**Persimmon**  
*Diospyros virginiana* and other species

**Description:** These trees have alternate, dark green, elliptic leaves with entire margins. The flowers are inconspicuous. The fruits are orange, have a sticky consistency, and have several seeds.

**Habitat and Distribution:** The persimmon is a common forest margin tree. It is wide spread in Africa, eastern North America, and the Far East.

**Edible Parts:** The leaves are a good source of vitamin C. The fruits are edible raw or baked. To make tea, dry the leaves and soak them in hot water. You can eat the roasted seeds.

#### CAUTION

Some persons are unable to digest persimmon pulp. Unripe persimmons are highly astringent and inedible.



**Nettle**  
*Urtica* and *Laportea* species

**Description:** These plants grow several feet high. They have small, inconspicuous flowers. Fine, hairlike bristles cover the stems, leafstalks, and undersides of leaves. The bristles cause a stinging sensation when they touch the skin.

**Habitat and Distribution:** Nettles prefer moist areas along streams or at the margins of forests. They are found throughout North America, Central America, the Caribbean, and northern Europe.

**Edible Parts:** Young shoots and leaves are edible. Boiling the plant for 10 to 15 minutes destroys the stinging element of the bristles. This plant is very nutritious.

**Other Uses:** Mature stems have a fibrous layer that you can divide into individual fibers and use to weave string or twine.



**Mulberry**  
*Morus* species

**Description:** This tree has alternate, simple, often lobed leaves with rough surfaces. Its fruits are blue or black and many-seeded.

**Habitat and Distribution:** Mulberry trees are found in forests, along roadsides, and in abandoned fields in temperate and tropical zones of North America, South America, Europe, Asia, and Africa.

**Edible Parts:** The fruit is edible raw or cooked. It can be dried for eating later.

**Other Uses:** You can shred the inner bark of the tree and use it to make twine or cord.



**Marsh marigold**  
*Calitha palustris*

**Description:** This plant has rounded, dark green leaves arising from a short stem. It has bright yellow flowers.

**Habitat and Distribution:** This plant is found in bogs, lakes, and slow-moving streams. It is abundant in arctic and subarctic regions, and in much of the eastern region of the northern United States.

**Edible Parts:** All parts are edible if boiled.

#### CAUTION

As with all water plants, do not eat this plant raw. Raw water plants may carry dangerous organisms that are removed only by cooking.



**Juniper**  
*Juniperus* species

**Description:** Junipers, sometimes called cedars, are trees or shrubs with very small, scalelike leaves densely crowded around the branches. Each leaf is less than 1.2 centimeters (1/3 inch) long. All species have a distinct aroma resembling the well-known cedar. The berrylike cones are usually blue and covered with a whitish wax.

**Habitat and Distribution:** Look for junipers in open, dry, sunny areas throughout North America and northern Europe. Some species are found in southeastern Europe, across Asia to Japan, and in the mountains of North Africa.

**Edible Parts:** The berries and twigs are edible. Eat the berries raw or roast the seeds to use as a coffee substitute. Use dried and crushed berries as a seasoning for meat. Gather young twigs to make a tea.

#### CAUTION

Many plants may be called cedars but are not related to junipers and may be harmful. Always look for the berrylike structures, needle leaves, and resinous, fragrant sap to be sure the plant you have is a juniper.





**Indian potato or Eskimo potato**  
*Claytonia* species

**Description:** All *Claytonia* species are somewhat fleshy plants only a few centimeters tall, with showy flowers about 2.5 centimeters (1 inch) across.

**Habitat and Distribution:** Some species are found in rich forests, where they are conspicuous before the leaves develop. Western species are found throughout most of the northern United States and in Canada.

**Edible Parts:** The tubers are edible but you should boil them before eating.



**Hackberry**  
*Celtis* species

**Description:** Hackberry trees have smooth, gray bark that often has corky warts or ridges. The tree may reach 39 meters (129 feet) in height. Hackberry trees have long-pointed leaves that grow in two rows. This tree bears small, round berries that can be eaten when they are ripe and fall from the tree. The wood of the hackberry is yellowish.

**Habitat and Distribution:** This plant is widespread in the United States, especially in and near ponds.

**Edible Parts:** Its berries are edible when they are ripe and fall from the tree.



**Foxtail grass**  
*Setaria* species

**Description:** This weedy grass is readily recognized by the narrow, cylindrical head containing long hairs. Its grains are small, less than 6 millimeters (1/4 inch) long. The dense heads of grain often droop when ripe.

**Habitat and Distribution:** Look for foxtail grasses in open, sunny areas, along roads, and at the margins of fields. Some species occur in wet, marshy areas. Species of *Setaria* are found throughout the United States, Europe, western Asia, and tropical Africa. In some parts of the world, foxtail grasses are grown as a food crop.

**Edible Parts:** The grains are edible raw but are very hard and sometimes bitter. Boiling removes some of the bitterness and makes them easier to eat.



**Fireweed**  
*Epilobium angustifolium*

**Description:** This plant grows up to 1.8 meters (6 feet) tall. It has large, showy, pink flowers and lance-shaped leaves. Its relative, the dwarf fireweed (*Epilobium latifolium*), grows 30 to 60 centimeters (12 to 24 inches) tall.

**Habitat and Distribution:** Tall fireweed is found in open woods, on hillsides, on stream banks, and near seashores in arctic regions. It is especially abundant in burned-over areas. Dwarf fireweed is found along streams, sandbars, and lakeshores and on alpine and arctic slopes.

**Edible Parts:** The leaves, stems, and flowers are edible in the spring but become tough in summer. You can split open the stems of old plants and eat the pith raw.



**Elderberry**  
*Sambucus canadensis*

**Description:** Elderberry is a many-stemmed shrub with opposite, compound leaves. It grows to a height of 6 meters (20 feet). Its flowers are fragrant, white, and borne in large flat-topped clusters up to 30 centimeters (12 inches) across. Its berrylike fruits are dark blue or black when ripe.

**Habitat and Distribution:** This plant is found in open, usually wet areas at the margins of marshes, rivers, ditches, and lakes. It grows throughout much of eastern North America.

**Edible Parts:** The flowers and fruits are edible. You can make a drink by soaking the flower heads for 8 hours, discarding the flowers, and drinking the liquid.

## CAUTION

All other parts of the plant are poisonous and dangerous if eaten.



**Dandelion**  
*Taraxacum officinale*

**Description:** Dandelion leaves have a jagged edge, grow close to the ground, and are seldom more than 20 centimeters (8 inches) long. The flowers are bright yellow. There are several dandelion species.

**Habitat and Distribution:** Dandelions grow in open, sunny locations throughout the Northern Hemisphere.

**Edible Parts:** All parts are edible. Eat the leaves raw or cooked. Boil the roots as a vegetable. Roots roasted and ground are a good coffee substitute. Dandelions are high in vitamins A and C and in calcium.

**Other Uses:** Use the white juice in the flower stems as glue.



**Crowberry**  
*Empetrum nigrum*

**Description:** This is a dwarf evergreen shrub with short needlelike leaves. It has small, shiny, black berries that remain on the bush throughout the winter.

**Habitat and Distribution:** Look for this plant in tundra throughout arctic regions of North America and Eurasia.

**Edible Parts:** The fruits are edible fresh or can be dried for later use.



**Cranberry**  
*Vaccinium macrocarpon*

**Description:** This plant has tiny leaves arranged alternately. Its stem creeps along the ground. Its fruits are red berries.

**Habitat and Distribution:** It only grows in open, sunny, wet areas in the colder regions of the Northern Hemisphere.

**Edible Parts:** The berries are very tart when eaten raw. Cook in a small amount of water and add sugar, if available, to make a jelly.

**Other Uses:** Cranberries may act as a diuretic. They are useful for treating urinary tract infections.



**Chestnut**  
*Castanea sativa*

**Description:** The European chestnut is usually a large tree, up to 18 meters (60 feet) in height.

**Habitat and Distribution:** In temperate regions, the chestnut is found in both hardwood and coniferous forests. In the tropics, it is found in semievergreen seasonal forests. They are found over all of middle and south Europe and across middle Asia to China and Japan. They are relatively abundant along the edge of meadows and as a forest tree. The European chestnut is one of the most common varieties. Wild chestnuts in Asia belong to the related chestnut species.

**Edible Parts:** Chestnuts are highly useful as survival food. Ripe nuts are usually picked in autumn, although unripe nuts picked while green may also be used for food. Perhaps the easiest way to prepare them is to roast the ripe nuts in embers. Cooked this way, they are quite tasty, and you can eat large quantities. Another way is to boil the kernels after removing the outer shell. After boiling the nuts until fairly soft, you can mash them like potatoes.



**Cattail**  
*Typha latifolia*

**Description:** Cattails are grasslike plants with strap-shaped leaves 1 to 5 centimeters (1/4 to 2 inches) wide and growing up to 1.8 meters (6 feet) tall. The male flowers are borne in a dense mass above the female flowers. The male flowers last only a short time, leaving the female flowers, which develop into the brown cattail. Pollen from the male flowers is often abundant and bright yellow.

**Habitat and Distribution:** Cattails are found throughout most of the world. Look for them in full sun areas at the margins of lakes, streams, canals, rivers, and brackish water.

**Edible Parts:** The young tender shoots are edible raw or cooked. The rhizome is often very tough but is a rich source of starch. Pound the rhizome to remove the starch and use as a flour. The pollen is also an exceptional source of starch. When the cattail is immature and still green, you can boil the female portion and eat it like corn on the cob.



**Blueberry and huckleberry**  
*Vaccinium* and *Gaylussacia* species

**Description:** These shrubs vary in size from 30 centimeters (12 inches) to 3.7 meters (12 feet) tall. All have alternate, simple leaves. Their fruits may be dark blue, black, or red and have many small seeds.

**Habitat and Distribution:** These plants prefer open, sunny areas. They are found throughout much of the north temperate regions and at higher elevations in Central America.

**Edible Parts:** Their fruits are edible raw.



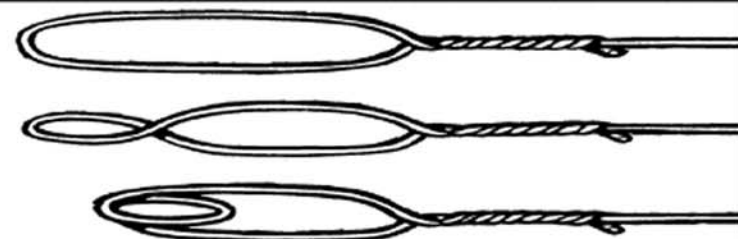
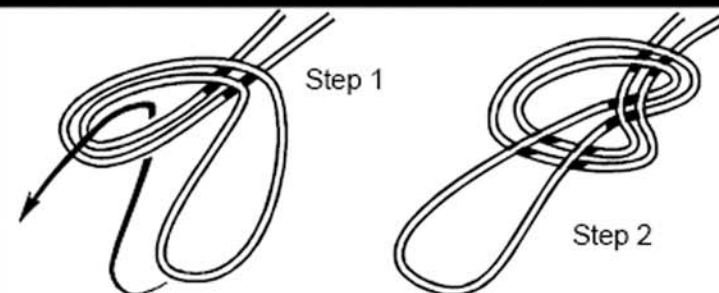
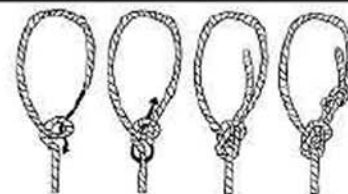
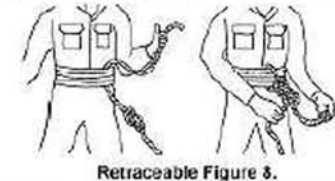
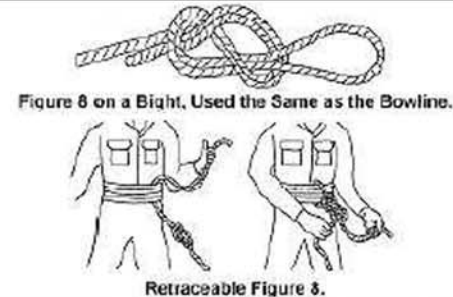
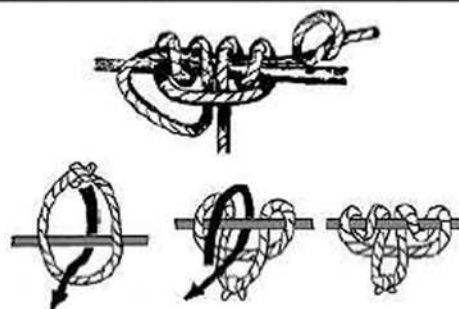
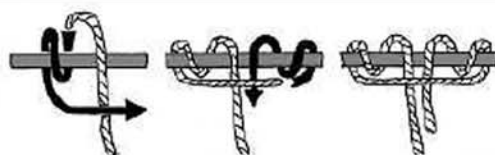
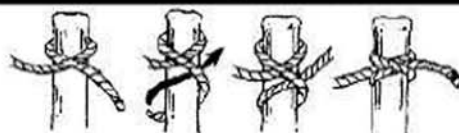
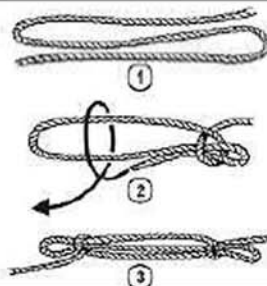
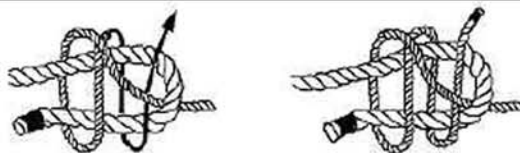
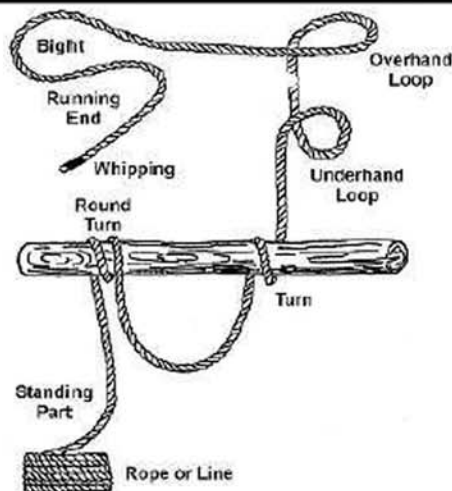
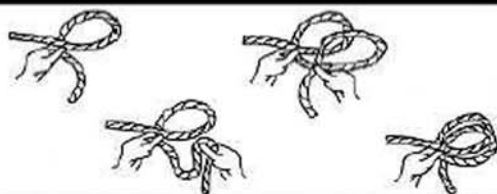
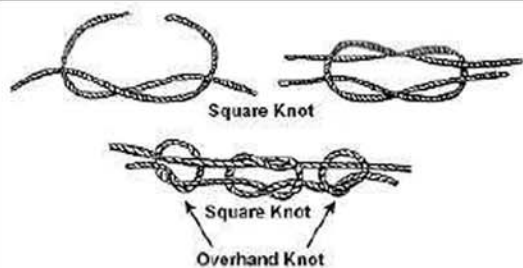
**Arctic willow**  
*Salix arctica*

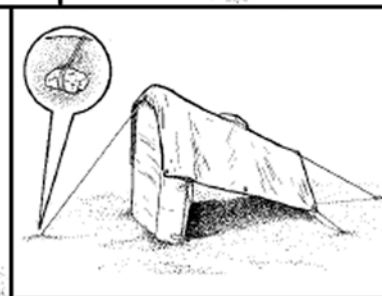
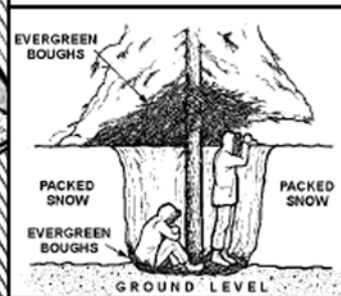
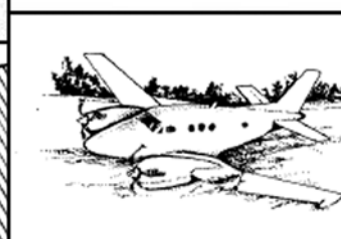
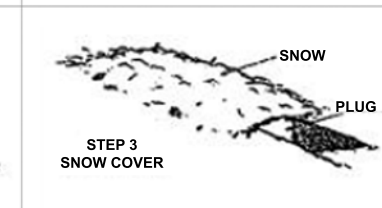
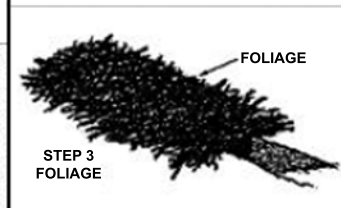
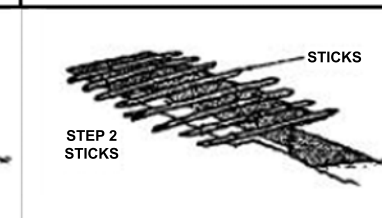
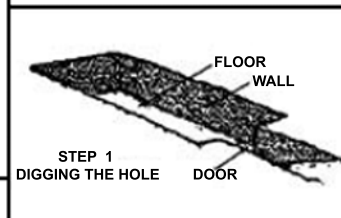
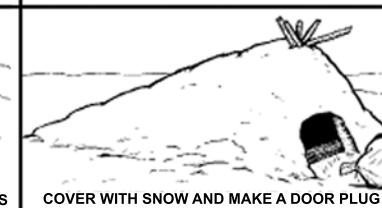
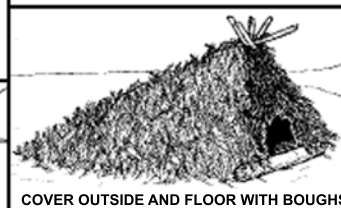
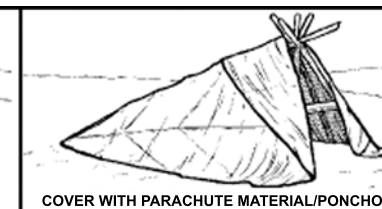
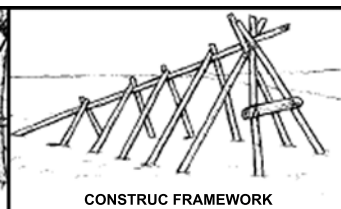
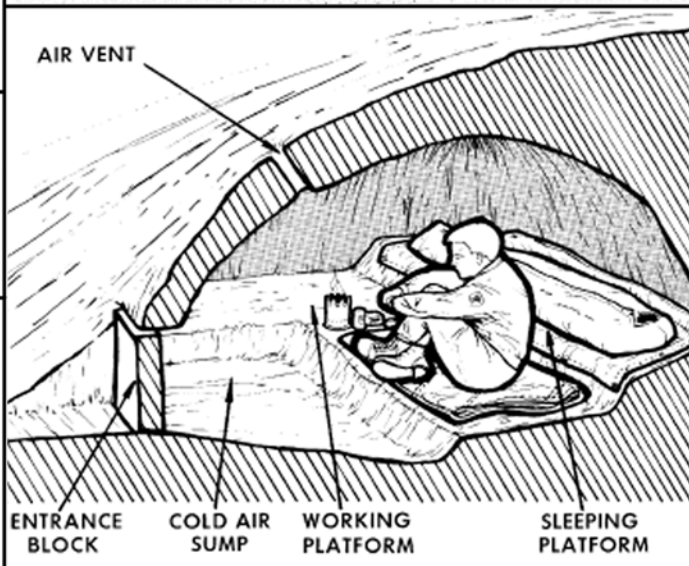
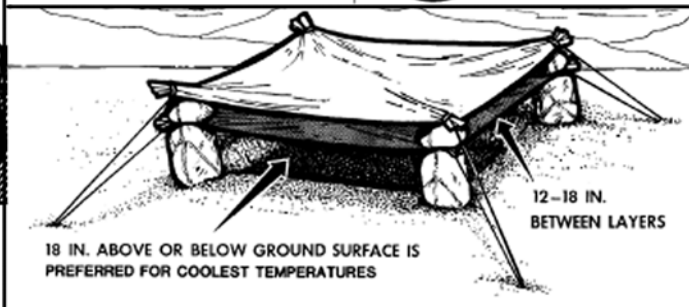
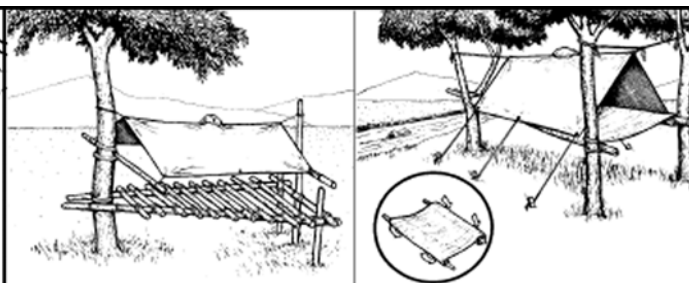
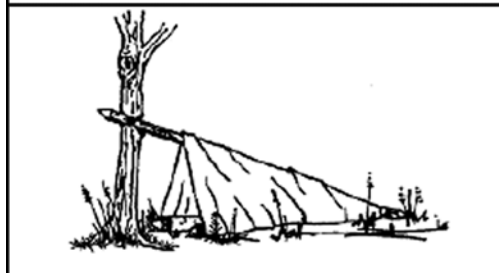
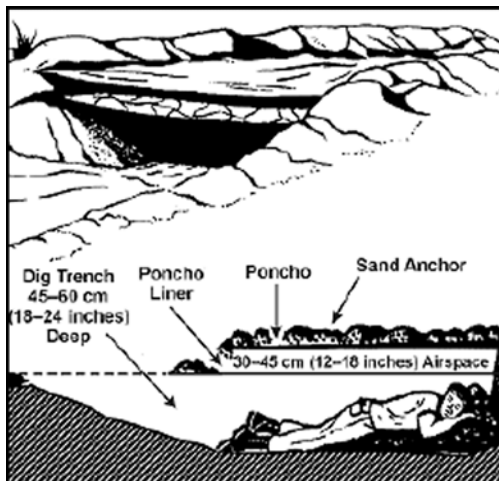
**Description:** The arctic willow is a shrub that never exceeds more than 60 centimeters (24 inches) in height and grows in clumps that form dense mats on the tundra.

**Habitat and Distribution:** The arctic willow is common on tundras in North America, Europe, and Asia. You can also find it in some mountainous areas in temperate regions.

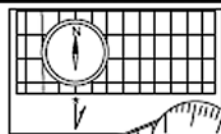
**Edible Parts:** You can collect the succulent, tender young shoots of the arctic willow in early spring. Strip off the outer bark of the new shoots and eat the inner portion raw. You can also peel and eat raw the young underground shoots of any of the various kinds of arctic willow. Young willow leaves are one of the richest sources of vitamin C, containing 7 to 10 times more than an orange.



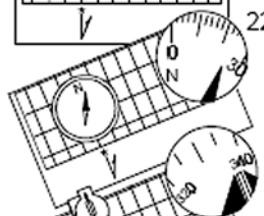




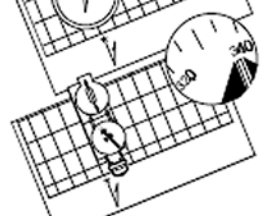




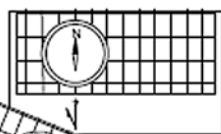
Floating needle compass and map aligned to magnetic north



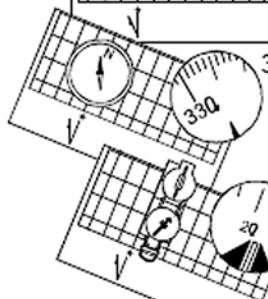
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Map is oriented to 22 1/2° easterly magnetic variation with floating needle compass



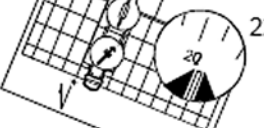
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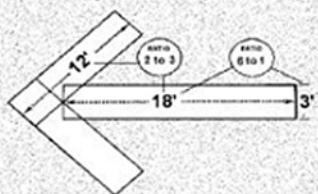
Floating needle compass and map aligned to magnetic north



337 1/2°  
Map is oriented to 22 1/2° westerly magnetic variation with floating needle compass



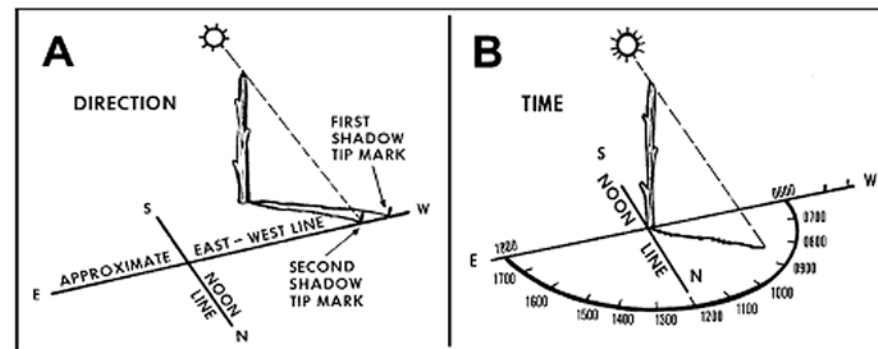
22 1/2°  
Map is oriented to 22 1/2° westerly magnetic variation with floating dial compass



NO.	MESSAGE	CODE SYMBOL
1	REQUIRE ASSISTANCE	<b>V</b>
2	REQUIRE MEDICAL ASSISTANCE	<b>X</b>
3	NO or NEGATIVE	<b>N</b>
4	YES or AFFIRMATIVE	<b>Y</b>
5	PROCEEDING IN THIS DIRECTION	<b>↑</b>

**CAUTION:** The following methods are **NOT** highly accurate and give only general cardinal direction.

(2) Using stick and shadow method to determine a true north-south line (**Figure II-1**).



**Figure II-1. Stick and Shadow Method**

(3) Remembering the sunrise/moonrise is in the east and sunset/moonset is in the west.

(4) Using a wristwatch to determine general cardinal direction (**Figure II-2**).

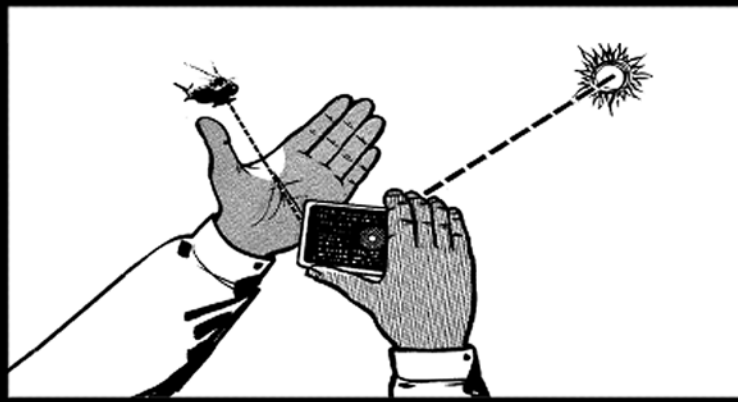
(a) Digital watches. Visualize a clock face on the watch.

(b) Northern Hemisphere. Point hour hand at the sun.

South is halfway between the hour hand and 12 o'clock position.

(c) Southern Hemisphere. Point the 12 o'clock position on your watch at the sun.

North is halfway between the 12 o'clock position and the hour hand.



## Taking a Bearing Using a Compass & Map

a. Orient the map by 3/4

(1) Using a true north-south line (Figure II-5) 1/4

(a) Unfold map and place on a firm, flat, level nonmetallic surface.

(b) Align the compass on a true north-south line.

(c) Rotate map and compass until stationary index line aligns with the magnetic variation indicated in marginal information.

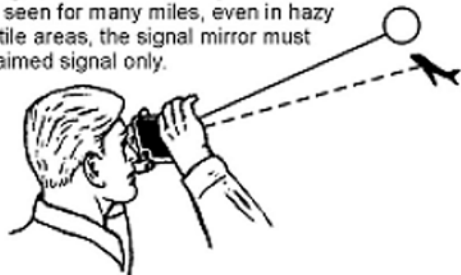
· Easterly (subtract variation from 360 degrees).

· Westerly (add variation to 360 degrees).

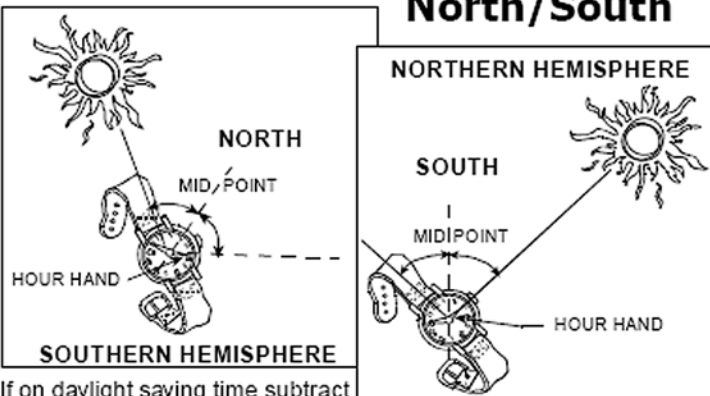


### How To Use The MK-3 Signal Mirror

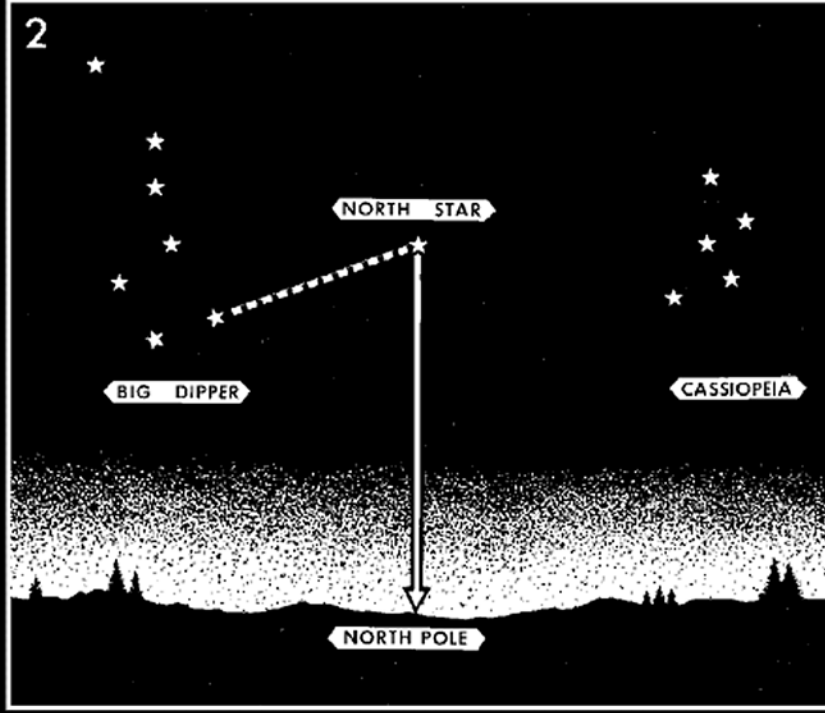
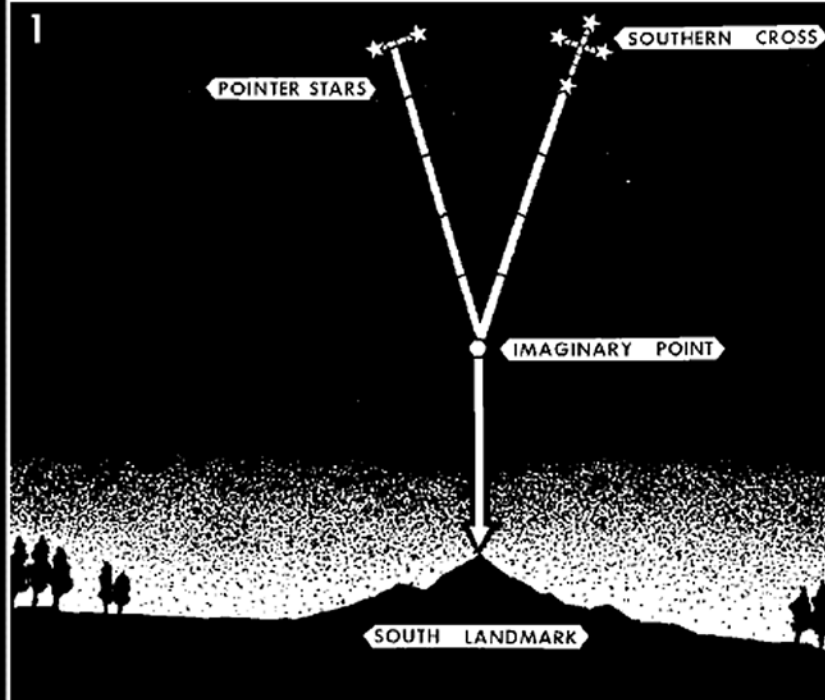
- 1 Reflect sunlight from mirror onto a nearby surface (raft, hand).
- 2 Slowly bring up to eye level and look through sighting hole. You will see a bright spot or light. This is the aim indicator.
- 3 Hold mirror near the eye and slowly turn and manipulate it so that the bright spot of light is on the target.
- 4 In friendly areas where only rescue by friendly forces is anticipated, free use of the mirror is recommended. Even though no aircraft or ships are in sight, continue to sweep the horizon. Mirror flashes may be seen for many miles, even in hazy weather. In hostile areas, the signal mirror must be used as an aimed signal only.



### Using A Watch - To Determine North/South



If on daylight saving time subtract one hour from actual time



### Travel Considerations

- a. Pick the easiest and safest route (non-combat).
- b. Maintain a realistic pace; take rest stops when needed.
- c. Avoid overdressing and overheating.
- d. Consider food and water requirements.
- e. Take special care of feet (change socks regularly).
- f. Pack equipment to prevent loss, damage, pack imbalance, and personal safety.
- g. Go around obstacles, not over or through them.
- h. Travel on trails whenever possible (non-combat).
- i. Travel in forested areas if possible.
- j. Avoid creek bottoms and ravines with NO escape in the event of heavy rains.
- k. Consider the following for swamps, lakes, and unfordable rivers:

- (1) Circumnavigate swamps, lakes, and bogs if needed.
- (2) Travel downstream to find people and slower water.
- (3) Travel upstream to find narrower and shallow water.

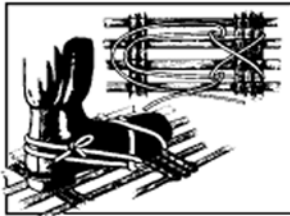
### Remember:

*The sunrise and moonrise is in the east*

*The sunset and moonset is in the west.*



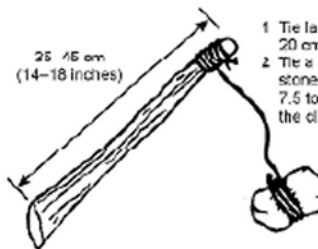
The snowshoe binding must be secured to the snowshoe so that the survivor's foot can pivot when walking.



**Binding** — make as shown from continuous length of split harness webbing or from suspension lines (braided lines preferred).



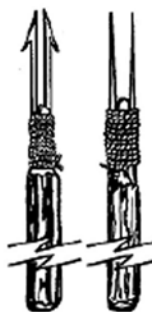
## IMPROVISED SUNSHADES



- 1 Tie lashing to club, leaving about 20 cm (8 inches) free.
- 2 Tie a 1.3- to 2.25-kg (4- to 6-pound) stone, rock, or other material 7.5 to 10 cm (3 to 4 inches) from the club.



Bamboo



Metal



Bone



Carved Wood Gorge Hook



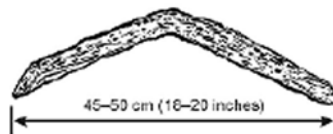
Wire



Thorn Hooks



Carved Wood Shanks



## THROWING STICK

12-21. The throwing stick, commonly known as the rabbit stick, is very effective against small game (squirrels, chipmunks, and rabbits). The rabbit stick itself is a blunt stick, naturally curved at about a 45-degree angle. Select a stick with the desired angle from heavy hardwood such as oak. Shave off two opposite sides so that the stick is flat like a boomerang. You must practice the throwing technique for accuracy and speed. First, align the target by extending the nonthrowing arm in line with the mid-to

lower-section of the target. Slowly and repeatedly raise the throwing arm up and back until the line with the throwing stick crosses the back at about a 45-degree angle or is in line with the nonthrowing hip. Bring the throwing arm forward until it is just slightly above and parallel to the nonthrowing



## Improvised foot protection:

- (1) Cut 2 to 4 layers of cloth into a 30-inch square.
- (2) Fold into a triangle.
- (3) Center foot on triangle with toes toward corner.
- (4) Fold front over the toes.
- (5) Fold side corners, one at a time, over the instep.
- (6) Secure by rope, vines, tape, etc., or tuck into other layers of material.



Chipping Tool

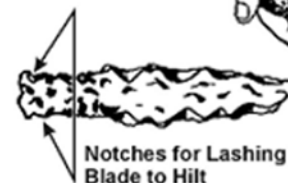
- 1 Shape blade. Strike glancing blows near edge to get edge thin enough to sharpen.

Sharp-Edged Piece of Stone Shaped Like a Knife Blade

- 2 Sharpen blade. Press downward with flaking tool at stone edge or push flaking tool along edge.



Flaking Tool



Notches for Lashing Blade to Hilt



Blade Lashed to Hilt (Hardwood, Antler)