

1. What are some essential items to consider for a survival kit?
  1. Lighter, metal match, waterproof matches.
  2. • Snare wire.
  3. • Signaling mirror.
  4. • Wrist compass.
  5. • Fish and snare line.
  6. • Fishhooks.
  7. • Candle.
  8. • Small hand lens.
  9. • Oxytetracycline tablets (diarrhea or infection).
  10. • Water purification tablets.
  11. • Solar blanket.
  12. • Surgical blades.
  13. • Butterfly sutures.
  14. • Condoms for water storage.
  15. • Chap Stick.
  16. • Needle and thread.
  17. • Knife.
2. What are basic items to have in every survival kit?
  1. First aid items.
  2. • Water purification tablets or drops.
  3. • Fire starting equipment.
  4. • Signaling items.
  5. • Food procurement items.
  6. • Shelter items.
3. What characteristics should the survival kit case have?
  1. Water repellent or waterproof.
  2. • Easy to carry or attach to your body.
  3. • Suitable to accept various sized components.
  4. • Durable.
4. What are some considerations for use of a survival kit?
  1. The environment is the key to the types of items you will need in your survival kit. How much equipment you put in your kit depends on how you will carry the kit. A kit carried on your body will have to be smaller than one carried in a vehicle. Always layer your survival kit, keeping the most important items on your body. For example, your map and compass should always be on your body. Carry less important items on your load-bearing equipment. Place bulky items in the rucksack.
5. What are important considerations regarding Injury, Illness, or Death in a survival situation?
  1. Injury, illness, and death are real possibilities a survivor has to face. Perhaps nothing is more stressful than being alone in an unfamiliar environment where you could die from hostile action, an accident, or from eating something lethal. Illness and injury can also add to stress by limiting your ability to maneuver, get

food and drink, find shelter, and defend yourself. Even if illness and injury don't lead to death, they add to stress through the pain and discomfort they generate. It is only by controlling the stress associated with the vulnerability to injury, illness, and death that a soldier can have the courage to take the risks associated with survival tasks.

6. What are the most common signs of excessive distress?
  1. Difficulty making decisions.
  2. • Angry outbursts.
  3. • Forgetfulness.
  4. • Low energy level.
  5. • Constant worrying.
  6. • Propensity for mistakes.
  7. • Thoughts about death or suicide.
  8. • Trouble getting along with others.
  9. • Withdrawing from others.
  10. • Hiding from responsibilities.
7. Do we have a need for stress? How does stress help us function?
  1. We need stress because it has many positive benefits. Stress provides us with challenges; it gives us chances to learn about our values and strengths. Stress can show our ability to handle pressure without breaking; it tests our adaptability and flexibility; it can stimulate us to do our best.
8. Why is it beneficial to act like native peoples and animals in foreign environments?
  1. The natives and animals of a region have adapted to their environment. To get a feel of the area, watch how the people go about their daily routine. When and what do they eat? When, where, and how do they get their food? When and where do they go for water? What time do they usually go to bed and get up? These actions are important to you when you are trying to avoid capture.
9. Why is it important to value living?
  1. All of us were born kicking and fighting to live, but we have become used to the soft life. We have become creatures of comfort. We dislike inconveniences and discomforts. What happens when we are faced with a survival situation with its stresses, inconveniences, and discomforts? This is when the will to live- placing a high value on living-is vital.
10. Why is it important to know how to improvise?
  1. Take a tool designed for a specific purpose and see how many other uses you can make of it. Learn to use natural objects around you for different needs. An example is using a rock for a hammer. No matter how complete a survival kit you have with you, it will run out or wear out after a while.
11. Why is it important to manage fear and panic in a survival situation?
  1. The greatest enemies in a combat survival and evasion situation are fear and panic. If uncontrolled, they can destroy your ability to make an intelligent decision.
12. What are important locations to remember in a survival situation?
  1. The location of enemy units and controlled areas.

2. • The location of friendly units and controlled areas.
  3. • The location of local water sources (especially important in the desert).
  4. • Areas that will provide good cover and concealment.
13. U -Use All Your Senses, Undue Haste Makes Waste
1. You may make a wrong move when you react quickly without thinking or planning. That move may result in your capture or death. Don't move just for the sake of taking action. Consider all aspects of your situation (size up your situation) before you make a decision and a move.
14. Why is it important to take inventory of your equipment in a survival situation?
1. Perhaps in the heat of battle, you lost or damaged some of your equipment. Check to see what equipment you have and what condition it is in. Now that you have sized up your situation, surroundings, physical condition, and equipment, you are ready to make your survival plan. In doing so, keep in mind your basic physical needs--water, food, and shelter.
15. Why is it important to examine your physical condition in a survival situation?
1. The pressure of the battle you were in or the trauma of being in a survival situation may have caused you to overlook wounds you received. Check your wounds and give yourself first aid. Take care to prevent further bodily harm. For instance, in any climate, drink plenty of water to prevent dehydration. If you are in a cold or wet climate, put on additional clothing to prevent hypothermia.
16. Why is it important to examine your environment in a survival situation?
1. Determine the pattern of the area. Get a feel for what is going on around you. Every environment, whether forest, jungle, or desert, has a rhythm or pattern. This rhythm or pattern includes animal and bird noises and movements and insect sounds. It may also include enemy traffic and civilian movements.
17. What are some considerations to make when finding shelter?
1. If you are in a combat situation, find a place where you can conceal yourself from the enemy. Remember, security takes priority. Use your senses of hearing, smell, and sight to get a feel for the battlefield. What is the enemy doing? Advancing? Holding in place Retreating? You will have to consider what is developing on the battlefield when you make your survival plan.
18. What is dehydration and how does it impact your health?
1. Dehydration results from inadequate replacement of lost body fluids. It decreases your efficiency and, if injured, increases your susceptibility to severe shock.daily. Other factors, such as heat exposure, cold exposure, intense activity, high altitude, burns, or illness, can cause your body to lose more water. You must replace this water.
19. Is thirst a good indicator of how much water you need?
1. You replace the water as you lose it. Trying to make up a deficit is difficult in a survival situation, and thirst is not a sign of how much water you need.
20. How can you ensure adequate water intake over time?
1. Most people cannot comfortably drink more than 1 liter of water at a time. So, even when not thirsty, drink small amounts of water at regular intervals each hour to prevent dehydration.

21. In addition to water, what is lost as people become more dehydrated?
1. With the loss of water there is also a loss of electrolytes (body salts). The average diet can usually keep up with these losses but in an extreme situation or illness, additional sources need to be provided. A mixture of 0.25 teaspoon of salt to 1 liter of water will provide a concentration that the body tissues can readily absorb.
22. Of all the physical problems encountered in a survival situation, the loss of water is the most preventable. What are basic guidelines for the prevention of dehydration?
1. Always drink water when eating. Water is used and consumed as a part of the digestion process and can lead to dehydration.
  2. • Acclimatize. The body performs more efficiently in extreme conditions when acclimatized.
  3. • Conserve sweat not water. Limit sweat-producing activities but drink water.
  4. • Ration water. Until you find a suitable source, ration your water sensibly. A daily intake of 500 cubic centimeter (0.5 liter) of a sugar-water mixture (2 teaspoons per liter) will suffice to prevent severe dehydration for at least a week, provided you keep water losses to a minimum by limiting activity and heat gain or loss.
23. How can you use the pulse and breathing rate to estimate fluid loss?
1. With a 0.75 liter loss the wrist pulse rate will be under 100 beats per minute and the breathing rate 12 to 20 breaths per minute.
  2. With a 0.75 to 1.5 liter loss the pulse rate will be 100 to 120 beats per minute and 20 to 30 breaths per minute. With a 1.5 to 2 liter loss the pulse rate will be 120 to 140 beats per minute and 30 to 40 breaths per minute. Vital signs above these rates require more advanced care.
24. Although you can live several weeks without food, you need an adequate amount to stay healthy. How does a lack of food impact your performance?
1. Without food your mental and physical capabilities will deteriorate rapidly, and you will become weak. Food replenishes the substances that your body burns and provides energy. It provides vitamins, minerals, salts, and other elements essential to good health. Possibly more important, it helps morale.
25. Calories are a measure of heat and potential energy. How many calories does the average person need to function?
1. The average person needs 2,000 calories per day to function at a minimum level. An adequate amount of carbohydrates, fats, and proteins without an adequate caloric intake will lead to starvation and cannibalism of the body's own tissue for energy.
26. How do plants provide you with energy?
1. Many plants provide enough protein to keep the body at normal efficiency. Although plants may not provide a balanced diet, they will sustain you even in the arctic, where meat's heat-producing qualities are normally essential. Many plant foods such as nuts and seeds will give you enough protein and oils for normal efficiency. Roots, green vegetables, and plant food containing natural sugar will provide calories and carbohydrates that give the body natural energy.

27. What are better sources of nutrients than plants?

1. Meat is more nourishing than plant food. In fact, it may even be more readily available in some places. However, to get meat, you need to know the habits of, and how to capture, the various wildlife. To satisfy your immediate food needs, first seek the more abundant and more easily obtained wildlife, such as insects, crustaceans, mollusks, fish, and reptiles. These can satisfy your immediate hunger while you are preparing traps and snares for larger game.

28. What role does hygiene play in survival?

1. 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. 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.

29. Why should you keep your hands clean?

1. Germs on your hands can infect food and wounds. Wash your hands after handling any material that is likely to carry germs, after visiting the latrine, 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.

30. Why should you keep your hair clean?

1. 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.

31. Why should you keep your clothing clean?

1. Keep your clothing and bedding as clean as possible to reduce the chance of skin infection as well as to decrease the danger of 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.

32. Why should you keep your mouth clean? How can you keep your mouth clean without a toothbrush and toothpaste?

1. 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 long and 1 centimeter wide. Chew one end of the stick to separate the fibers. Now 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.

33. Why should you take care of your feet?

1. 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.

34. What should you do if you get a blister on your foot?

1. 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

35. To avoid having the blister burst or tear under pressure and cause a painful and open sore, do the following:

1. Obtain a sewing-type needle and a clean or sterilized thread.
2. • Run the needle and thread through the blister after cleaning the blister.
3. • 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.
4. • Pad around the blister.

36. Why is sufficient rest important for performance in a survival situation?

1. 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.

37. What are pressure points?

1. A pressure point is a location where the main artery to the wound lies near the surface of the skin or where the artery passes directly over a bony prominence (Figure 4-3). You can use digital pressure on a pressure point to slow arterial bleeding until the application of a pressure dressing. Pressure point control is not as effective for controlling bleeding as direct pressure exerted on the wound. It is rare when a single major compressible artery supplies a damaged vessel.

38. What can proper shelter do for you?

1. A shelter can protect you from the sun, insects, wind, rain, snow, hot or cold, and observation. It can give you a feeling of well-being. It can help you maintain your will to survive.

39. In some areas, your need for shelter may take precedence over your need for food and possibly even your need for water. What are situations where shelter takes precedence over things like this?

1. For example, prolonged exposure to cold can cause excessive fatigue and weakness (exhaustion). An exhausted person may develop a "passive" outlook, thereby losing the will to survive.

40. What is the most common error in making a shelter?

1. is to make it too large. A shelter must be large enough to protect you. It must also be small enough to contain your body heat, especially in cold climates.

41. What are two requirements for shelter?

1. It must contain material to make the type of shelter you need.
2. It must be large enough and level enough for you to lie down comfortably.

42. In many situations, security and concealment is paramount for shelter. How does this influence the creation of shelter sites?
1. Provides concealment from enemy observation.
  2. • Has camouflaged escape routes.
  3. • Is suitable for signaling, if necessary.
  4. • Provides protection against wild animals and rocks and dead trees that might fall.
  5. • Is free from insects, reptiles, and poisonous plants.
43. What are some problems that could occur near your shelter site?
1. Avoid flash flood areas in foothills.
  2. • Avoid avalanche or rockslide areas in mountainous terrain.
  3. • Avoid sites near bodies of water that are below the high water mark.
44. When considering shelter site selection, use the word BLISS as a guide. What is BLISS?
1. B - Blend in with the surroundings.
  2. L - Low silhouette.
  3. I - Irregular shape.
  4. S - Small.
  5. S - Secluded location.
45. What determines the type of shelter you need?
1. How much time and effort you need to build the shelter.
  2. • If the shelter will adequately protect you from the elements (sun, wind, rain, snow).
  3. • If you have the tools to build it. If not, can you make improvised tools?
  4. • If you have the type and amount of materials needed to build it.
46. If you plan to use the lean-to for more than one night, or if you expect rain, what should you do?
1. Make a center support for the lean-to. Another method is to place a stick upright under the center of the lean-to. This method, however, will restrict your space and movements in the shelter. To reduce heat loss to the ground, place some type of insulating material, such as leaves or pine needles, inside your lean-to. When at rest, you lose as much as 80 percent of your body heat to the ground.
47. To increase your security from enemy observation, lower the lean-to's silhouette by making two changes. What are these changes?
1. First, secure the support lines to the trees at knee height (not at waist height) using two knee-high sticks in the two center grommets (sides of lean-to). Second, angle the poncho to the ground, securing it with sharpened sticks, as above.
48. A tent (Figure 5-2) provides a low silhouette. It also protects you from the elements on two sides. What are some disadvantages of the tent?
1. It has, however, less usable space and observation area than a lean-to, decreasing your reaction time to enemy detection.
49. To make this tent, what supplies do you need?
1. You need a poncho, two 1.5- to 2.5-meter ropes, six sharpened sticks about 30 centimeters long, and two trees 2 to 3 meters apart.
50. How do you make a tent?

1. Tie off the poncho hood in the same way as the poncho lean-to. Tie a 1.5- to 2.5-meter rope to the center grommet on each side of the poncho. Tie the other ends of these ropes at about knee height to two trees 2 to 3 meters apart and stretch the poncho tight. Draw one side of the poncho tight and secure it to the ground pushing sharpened sticks through the grommets. Follow the same procedure on the other side.
51. If you have a parachute and three poles and the tactical situation allows, what can you make? What other supplies will you need?
1. Parachute tepee.
  2. You need a 14-gore section (normally) of canopy, stakes, a stout center pole, and inner core and needle to construct this tepee. You cut the suspension lines except for 40- to 45-centimeter lengths at the canopy's lower lateral band.
52. How do you make this tepee?
1. Select a shelter site and scribe a circle about 4 meters in diameter on the ground.
  2. • Stake the parachute material to the ground using the lines remaining at the lower lateral band.
  3. • After deciding where to place the shelter door, emplace a stake and tie the first line (from the lower lateral band) securely to it.
  4. • Stretch the parachute material taut to the next line, emplace a stake on the scribed line, and tie the line to it.
  5. • Continue the staking process until you have tied all the lines.
  6. • Loosely attach the top of the parachute material to the center pole with a suspension line you previously cut and, through trial and error, determine the point at which the parachute material will be pulled tight once the center pole is upright.
  7. • Then securely attach the material to the pole.
  8. • Using a suspension line (or inner core), sew the end gores together leaving 1 or 1.2 meters for a door. You use the same materials, except for the center pole, as for the one-pole parachute tepee.
53. How can you make this teepee?
1. Tie a line to the top of parachute material with a previously cut suspension line.
  2. • Throw the line over a tree limb, and tie it to the tree trunk.
  3. • Starting at the opposite side from the door, emplace a stake on the scribed 3.5- to 4.3-meter
  4. circle.
  5. • Tie the first line on the lower lateral band.
  6. • Continue emplacing the stakes and tying the lines to them.
  7. • After staking down the material, unfasten the line tied to the tree trunk, tighten the tepee material
  8. by pulling on this line, and tie it securely to the tree trunk.
54. A one-man shelter you can easily make using a parachute requires a tree and three poles. One pole should be about 4.5 meters long and the other two about 3 meters long. How do you make this shelter?
1. Secure the 4.5-meter pole to the tree at about waist height.



2. • Lay the two 3-meter poles on the ground on either side of and in the same direction as the 4.5-
  3. meter pole.
  4. • Lay the folded canopy over the 4.5 meter pole so that about the same amount of material hangs on both sides.
  5. • Tuck the excess material under the 3-meter poles, and spread it on the ground inside to serve as a floor.
  6. • Stake down or put a spreader between the two 3-meter poles at the shelter's entrance so they will not slide inward.
  7. • Use any excess material to cover the entrance.
55. Water is one of your most urgent needs in a survival situation. How much water do you need everyday to maintain efficiency?
1. You can't live long without it, especially in hot areas where you lose water rapidly through perspiration. Even in cold areas, you need a minimum of 2 liters of water each day to maintain efficiency.
56. More than three-fourths of your body is composed of fluids. How does your body lose this water and why must you replace it?
1. Your body loses fluid as a result of heat, cold, stress, and exertion. To function effectively, you must replace the fluid your body loses. So, one of your first goals is to obtain an adequate supply of water.
57. If you do not have a canteen, a cup, a can, or other type of container, how can you create a water container?
1. Improve one from plastic or water-resistant cloth.
  2. Shape the plastic or cloth into a bowl by pleating it.
  3. Use pins or other suitable items--even your hands--to hold the pleats.
58. How can you procure fresh water from condensation?
1. Heavy dew can provide water. Tie rags or tufts of fine grass around your ankles and walk through dew-covered grass before sunrise. As the rags or grass tufts absorb the dew, wring the water into a container. Repeat the process until you have a supply of water or until the dew is gone. Australian natives sometimes mop up as much as a liter an hour this way.
59. What can the presence of insects and animals tell you about nearby water sources?
1. Bees or ants going into a hole in a tree may point to a water-filled hole. Siphon the water with plastic tubing or scoop it up with an improvised dipper. You can also stuff cloth in the hole to absorb the water and then wring it from the cloth.
60. Where can water be found within plants?
1. Water sometimes gathers in tree crotches or rock crevices. Use the above procedures to get the water. In arid areas, bird droppings around a crack in the rocks may indicate water in or near the crack. Green bamboo thickets are an excellent source of fresh water. Water from green bamboo is clear and odorless. To get the water, bend a green bamboo stalk, tie it down, and cut off the top (Figure 6-3). The water will drip freely during the night. Old, cracked bamboo may contain water.
61. How can you get water from plantain trees?

1. Wherever you find banana or plantain trees, you can get water. Cut down the tree, leaving about a 30-centimeter stump, and scoop out the center of the stump so that the hollow is bowl-shaped. Water from the roots will immediately start to fill the hollow. The first three fillings of water will be bitter, but succeeding fillings will be palatable.
62. The milk from green (unripe) coconuts is a good thirst quencher. What is something you should consider when drinking coconut water?
  1. The milk from mature coconuts contains an oil that acts as a laxative.
63. How can you get water from plants with moist pulpy centers?
  1. Cut off a section of the plant and squeeze or smash the pulp so that the moisture runs out. Catch the liquid in a container.
64. You can use stills in various areas of the world. They draw moisture from the ground and from plant material. How long does it take for stills to procure water?
  1. You need certain materials to build a still, and you need time to let it collect the water. It takes about 24 hours to get 0.5 to 1 liter of water.
65. What do you need make an above ground still?
  1. you need a sunny slope on which to place the still, a clear plastic bag, green leafy vegetation, and a small rock
66. How do you make an above ground still?
  1. Fill the bag with air by turning the opening into the breeze or by "scooping" air into the bag. • Fill the plastic bag half to three-fourths full of green leafy vegetation. Be sure to remove all hard sticks or sharp spines that might puncture the bag.
67. What equipment do you need in order to create a below ground still? Where should you place your still?
  1. To make a belowground still, you need a digging tool, a container, a clear plastic sheet, a drinking tube, and a rock. Select a site where you believe the soil will contain moisture (such as a dry stream bed or a low spot where rainwater has collected). The soil at this site should be easy to dig, and sunlight must hit the site most of the day.
68. How do you make a below ground still?
  1. • Dig a bowl-shaped hole about 1 meter across and 60 centimeters deep.
  2. • Dig a sump in the center of the hole. The sump's depth and perimeter will depend on the size of the container that you have to place in it. The bottom of the sump should allow the container to stand upright.
  3. • Anchor the tubing to the container's bottom by forming a loose overhand knot in the tubing.
  4. • Place the container upright in the sump.
  5. • Extend the unanchored end of the tubing up, over, and beyond the lip of the hole.
  6. • Place the plastic sheet over the hole, covering its edges with soil to hold it in place.
  7. • Place a rock in the center of the plastic sheet.

8. • Lower the plastic sheet into the hole until it is about 40 centimeters below ground level. It now forms an inverted cone with the rock at its apex. Make sure that the cone's apex is directly over your container. Also make sure the plastic cone does not touch the sides of the hole because the earth will absorb the condensed water.
  9. • Put more soil on the edges of the plastic to hold it securely in place and to prevent the loss of moisture.
  10. • Plug the tube when not in use so that the moisture will not evaporate.
69. How do you collect water from a water still?
1. You can drink water without disturbing the still by using the tube as a straw. You may want to use plants in the hole as a moisture source. If so, dig out additional soil from the sides of the hole to form a slope on which to place the plants.
70. Should water you collect be purified?
1. Rainwater collected in clean containers or in plants is usually safe for drinking. However, purify water from lakes, ponds, swamps, springs, or streams, especially the water near human settlements or in the tropics.
71. When possible, purify all water you got from vegetation or from the ground by using iodine or chlorine, or by boiling. What are some methods for purifying water?
1. • Using water purification tablets. (Follow the directions provided.)
  2. • Placing 5 drops of 2 percent tincture of iodine in a canteen full of clear water. If the canteen is full of cloudy or cold water, use 10 drops. (Let the canteen of water stand for 30 minutes before drinking.)
  3. • Boiling water for 1 minute at sea level, adding 1 minute for each additional 300 meters above sea level, or boil for 10 minutes no matter where you are.
72. By drinking nonpotable water you may contract diseases or swallow organisms that can harm you. What are some examples of such diseases?
1. Dysentery.
  2. Cholera and typhoid.
  3. Flukes.
  4. Leeches.
73. If the water you find is also muddy, stagnant, and foul smelling, you can clear the water. How do you do so?
1. By placing it in a container and letting it stand for 12 hours.
  2. • By pouring it through a filtering system.
  3. These procedures only clear the water and make it more palatable. You will have to purify it.
74. How do you make a filtering system?
1. To make a filtering system, place several centimeters or layers of filtering material such as sand, crushed rock, charcoal, or cloth in bamboo, a hollow log, or an article of clothing. Remove the odor from water by adding charcoal from your fire. Let the water stand for 45 minutes before drinking it.
75. Fire can cause problems, as well.

1. The enemy can detect the smoke and light it produces. It can cause forest fires or destroy essential equipment. Fire can also cause burns carbon monoxide poisoning when used in shelters.
76. What can fire do for you in a survival scenario?
1. In many survival situations, the ability to start a fire can make the difference between living and dying. Fire can fulfill many needs. It can provide warmth and comfort. It not only cooks and preserves food, it also provides warmth in the form of heated food that saves calories our body normally uses to produce body heat.
  2. You can use fire to purify water, sterilize bandages, signal for rescue, and provide protection from animals. It can be a psychological boost by providing peace of mind and companionship. You can also use fire to produce tools and weapons.
77. Understanding the concept of the fire triangle is very important in correctly constructing and maintaining a fire. What does the fire triangle represent?
1. The three sides of the triangle represent air, heat, and fuel. If you remove any of these, the fire will go out. The correct ratio of these components is very important for a fire to burn at its greatest capability. The only way to learn this ratio is to practice.
78. What role does fuel play in fire?
1. Fuel (in a nongaseous state) does not burn directly. When you apply heat to a fuel, it produces a gas. This gas, combined with oxygen in the air, burns.
79. You will have to decide what site and arrangement to use. Before building a fire what should you consider?
1. • The area (terrain and climate) in which you are operating.
  2. • The materials and tools available.
  3. • Time: how much time you have?
  4. • Need: why you need a fire?
  5. • Security: how close is the enemy?
80. How do you make an underground fireplace?
1. • Dig a hole in the ground.
  2. • On the upwind side of this hole, poke or dig a large connecting hole for ventilation.
  3. • Build your fire in the hole as illustrated.
81. What is Tinder?
1. Dry material that ignites with little heat--a spark starts a fire. The tinder must be absolutely dry to be sure just a spark will ignite it. If you only have a device that generates sparks, charred cloth will be almost essential. It holds a spark for long periods, allowing you to put tinder on the hot area to generate a small flame. You can make charred cloth by heating cotton cloth until it turns black, but does not burn. Once it is black, you must keep it in an airtight container to keep it dry. Prepare this cloth well in advance of any survival situation. Add it to your individual survival kit.
82. What is Kindling?

1. is readily combustible material that you add to the burning tinder. Again, this material should be absolutely dry to ensure rapid burning. Kindling increases the fire's temperature so that it will ignite less combustible material.
83. What is Fuel?
1. less combustible material that burns slowly and steadily once ignited.
84. How do you make a lean to fire?
1. To lay this fire (Figure 7-5), push a green stick into the ground at a 30-degree angle. Point the end of the stick in the direction of the wind. Place some tinder deep under this lean-to stick. Lean pieces of kindling against the lean-to stick. Light the tinder. As the kindling catches fire from the tinder, add more kindling.
85. How do you make a cross ditch fire?
1. To use this method (Figure 7-5), scratch a cross about 30 centimeters in size in the ground. Dig the cross 7.5 centimeters deep. Put a large wad of tinder in the middle of the cross. Build a kindling pyramid above the tinder. The shallow ditch allows air to sweep under the tinder to provide a draft.
86. How do you make a pyramid fire?
1. To lay this fire (Figure 7-5), place two small logs or branches parallel on the ground. Place a solid layer of small logs across the parallel logs. Add three or four more layers of logs or branches, each layer smaller than and at a right angle to the layer below it. Make a starter fire on top of the pyramid. As the starter fire burns, it will ignite the logs below it. This gives you a fire that burns downward, requiring no attention during the night. There are several other ways to lay a fire that are quite effective. Your situation and the material available in the area may make another method more suitable.
87. What should you consider when using matches in your survival kit?
1. Make sure these matches are waterproof. Also, store them in a waterproof container along with a dependable striker pad.
88. How can you use a convex lens to start a fire?
1. Use this method (Figure 7-6) only on bright, sunny days. The lens can come from binoculars, 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 flame, and apply it to the fire lay.
89. How can you use metal matches to start a fire?
1. 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.
90. How can you use batteries to start a fire?
1. 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.
91. How can you use gunpowder to start a fire?

1. Often, you will have ammunition with your equipment. If so, carefully extract the bullet from the shell casing, and use the gunpowder as tinder. A spark will ignite the powder. Be extremely careful when extracting the bullet from the case.
92. How can you use flint and steel to start a fire?
1. 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 edge with a piece of carbon steel (stainless steel will not produce a good spark). This method requires a loose-jointed wrist and practice. When a spark has caught in the tinder, blow on it. The spark will spread and burst into flames.
93. What is the fire-plow method for starting fires?
1. The fire-plow (Figure 7-7) is a friction method of ignition. You rub a hardwood shaft against a softer wood base. To use this method, cut a straight groove in the base and plow the blunt tip of the shaft up and down the groove. The plowing action of the shaft pushes out small particles of wood fibers. Then, as you apply more pressure on each stroke, the friction ignites the wood particles.
94. After water, what is considered man's most important priority?
1. Finding food. In contemplating virtually any hypothetical survival situation, the mind immediately turns to thoughts of food. Unless the situation occurs in an arid environment, even water, which is more important to maintaining body functions, will almost always follow food in our initial thoughts. The survivor must remember that the three essentials of survival--water, food, and shelter--are prioritized according to the estimate of the actual situation.
95. What is a good strategy for getting food sources from animals?
1. Unless you have the chance to take large game, concentrate your efforts on the smaller animals, due to their abundance. The smaller animal species are also easier to prepare. You must not know all the animal species that are suitable as food. Relatively few are poisonous, and they make a smaller list to remember.
96. When you are in a survival situation, why is important to be able to eat foods you aren't used to eating?
1. You can, with relatively few exceptions, eat anything that crawls, swims, walks, or flies. The first obstacle is overcoming your natural aversion to a particular food source. Historically, people in starvation situations have resorted to eating everything imaginable for nourishment. A person who ignores an otherwise healthy food source due to a personal bias, or because he feels it is unappetizing, is risking his own survival.
97. What role do insects play in food procurement?
1. The most abundant life-form on earth, insects are easily caught. Insects provide 65 to 80 percent protein compared to 20 percent for beef. This fact makes insects an important, if not overly appetizing, food source. Insects to avoid include all adults that sting or bite, hairy or brightly colored insects, and caterpillars and insects that have a pungent odor. Also avoid spiders and common disease carriers such as ticks, flies, and mosquitoes.
98. Where are good locations for finding insects?

1. Rotting logs lying on the ground are excellent places to look for a variety of insects including ants, termites, beetles, and grubs, which are beetle larvae. Do not overlook insect nests on or in the ground.
  2. Grassy areas, such as fields, are good areas to search because the insects are easily seen.
99. Are worms a good food source?
1. Worms (Annelidea) are an excellent protein source. Dig for them in damp humus soil or watch for them on the ground after a rain. After capturing them, drop them into clean, potable water for a few minutes. The worms will naturally purge or wash themselves out, after which you can eat them raw.
100. Are shrimp good sources of food? How can you catch shrimp in the wild?
1. Freshwater shrimp range in size from 0.25 centimeter up to 2.5 centimeters. They can form rather large colonies in mats of floating algae or in mud bottoms of ponds and lakes.
101. Crayfish are akin to marine lobsters and crabs. How can you identify them?
1. Their hard exoskeleton and five pairs of legs, the front pair having oversized pincers.
102. How can crayfish be located?
1. but you can locate them in the daytime by looking under and around stones in streams. You can also find them by looking in the soft mud near the chimney like breathing holes of their nests. You can catch crayfish by tying bits of offal or internal organs to a string. When the crayfish grabs the bait, pull it to shore before it has a chance to release the bait.
103. How can you find saltwater lobsters, crabs, and shrimp from the surf's edge?
1. You find saltwater lobsters, crabs, and shrimp from the surf's edge out to water 10 meters deep.
104. What may shrimp be attracted to at night?
1. a light at night where you can scoop them up with a net.
105. What can you catch lobsters and crabs with?
1. baited trap or a baited hook.
106. Crabs will come to bait placed at the edge of:
1. the surf, where you can trap or net them. Lobsters and crabs are nocturnal and caught best at night.
107. What are Mollusks?
1. This class includes octopuses and freshwater and saltwater shellfish such as snails, clams, mussels, bivalves, barnacles, periwinkles, chitons, and sea urchins (Figure 8-1). You find bivalves similar to our freshwater mussel and terrestrial and aquatic snails worldwide under all water conditions.
108. Where are River snails or freshwater periwinkles plentiful?
1. rivers, streams, and lakes of northern coniferous forests. These snails may be pencil point or globular in shape.
109. In fresh water, look for mollusks in the shallows, especially in:
1. Shallows with a sandy or muddy bottom.
110. Large snails, called chitons, adhere tightly to:

1. Rocks above the surf line. Mussels usually form dense colonies in rock pools, on logs, or at the base of boulders.
111. Where are Mollusks occasionally poisonous?
  1. tropical zones during the summer!
112. What shellfish should not be eaten?
  1. Shellfish that are not covered by water at high tide!
113. What advantages do fish offer to the survivor or evader?
  1. They are usually more abundant than mammal wildlife, and the ways to get them are silent. To be successful at catching fish, you must know their habits. For instance, fish tend to feed heavily before a storm.
114. Fish are not likely to feed after a storm when:
  1. the water is muddy and swollen.
115. Does light often attract fish at night?
  1. Yes.
116. When there is a heavy current, where will fish often rest?
  1. Eddy, such as near rocks. Fish will also gather where there are deep pools, under overhanging brush, and in and around submerged foliage, logs, or other objects that offer them shelter.
117. There are no poisonous freshwater fish. What are some other risks that freshwater fish pose?
  1. However, the catfish species has sharp, needlelike protrusions on its dorsal fins and barbels. These can inflict painful puncture wounds that quickly become infected. Cook all freshwater fish to kill parasites. Also cook saltwater fish caught within a reef or within the influence of a freshwater source as a precaution.
118. Any marine life obtained farther out in the sea will not contain parasites because of the saltwater environment. What does this mean?
  1. You can eat these raw.
119. What do certain saltwater species of fish have?
  1. poisonous flesh. In some species the poison occurs seasonally in others, it is permanent. Examples of poisonous saltwater fish are the porcupine fish, triggerfish, cowfish, thorn fish, oilfish, red snapper, jack, and puffer (Figure 8-2). The barracuda, while not actually poisonous itself, may transmit ciguatera (fish poisoning) if eaten raw.
120. Are amphibians edible?
  1. Frogs and salamanders are easily found around bodies of fresh water. Frogs seldom move from the safety of the water's edge.
121. Are reptiles a good source of nutrients?
  1. good protein source and relatively easy to catch.
122. You should cook reptiles, but can they be eaten raw?
  1. In an emergency, you can eat them raw.
123. Their raw flesh may transmit parasites, but reptiles are cold blooded. What does this mean?
  1. They do not carry the blood diseases of the warm-blooded animals.
124. What are some animals you should avoid eating no matter what?



1. The box turtle is a commonly encountered turtle that you should not eat. It feeds on poisonous mushrooms and may build up a highly toxic poison in its flesh. Cooking does not destroy this toxin. Avoid the hawksbill turtle, found in the Atlantic Ocean, because of its poisonous thorax gland. Poisonous snakes, alligators, crocodiles, and large sea turtles present obvious hazards to the survivor.
125. Are all species of birds edible?
  1. Yes, although the flavor will vary considerably. You may skin fish-eating birds to improve their taste.
126. What is one thing you must consider for capturing animals?
  1. you must understand birds' common habits to have a realistic chance of capturing them.
127. Nesting birds present another food source. What is this food source?
  1. Eggs. Remove all but two or three eggs from the clutch, marking the ones that you leave. The bird will continue to lay more eggs to fill the clutch. Continue removing the fresh eggs, leaving the ones you marked.
128. Mammals are excellent protein sources and, for Americans, the most tasty food source. What are some drawbacks that come with eating animals?
  1. There are some drawbacks to obtaining mammals. In a hostile environment, the enemy may detect any traps or snares placed on land. The amount of injury an animal can inflict is in direct proportion to its size.
129. All mammals have teeth and nearly all will bite in self-defense. What does this mean when you are hunting them for food?
  1. Even a squirrel can inflict a serious wound and any bite presents a serious risk of infection. Also, a mother can be extremely aggressive in defense of her young. Any animal with no route of escape will fight when cornered.
130. To be effective with any type of trap or snare, you must: Be familiar with the species of animal you intend to catch.
  1. • Be capable of constructing a proper trap.
  2. • Not alarm the prey by leaving signs of your presence.
131. You must determine what species are in a given area and set your traps specifically with those animals in mind. What should you look for when setting traps for animals?
  1. Runs and trails.
  2. • Tracks.
  3. • Droppings.
  4. • Chewed or rubbed vegetation.
  5. • Nesting or roosting sites.
  6. • Feeding and watering areas.
132. Where should you position your traps and snares?
  1. In a location that there is proof that animals pass through.
133. What must you determine when setting traps on game trails?
  1. it is a "run" or a "trail." A trail will show signs of use by several species and will be rather distinct. A run is usually smaller and less distinct and will only contain signs of one species.

134. What must you eliminate when setting traps?
  1. human scent on and around the trap you set. Although birds do not have a developed sense of smell, nearly all mammals depend on smell even more than on sight.
135. Traps or snares placed on a trail or run should use what?
  1. Channelization.
136. How do you build a channel for traps?
  1. construct a funnel-shaped barrier extending from the sides of the trail toward the trap, with the narrowest part nearest the trap.
137. Does Baiting a trap or snare increases your chances of catching an animal?
  1. When catching fish, you must bait nearly all the devices. Success with an unbaited trap depends on its placement in a good location. A baited trap can actually draw animals to it.
138. The bait should be something the animal knows. What are some guidelines about baiting traps?
  1. This bait, however, should not be so readily available in the immediate area that the animal can get it close by. For example, baiting a trap with corn in the middle of a corn field would not be likely to work. Likewise, if corn is not grown in the region, a corn-baited trap may arouse an animal's curiosity and keep it alerted while it ponders the strange food.
139. What are traps and snares designed to do?
  1. crush, choke, hang, or entangle the prey. A single trap or snare will commonly incorporate two or more of these principles.
140. What mechanisms make traps and snares work?
  1. The mechanisms that provide power to the trap are almost always very simple. The struggling victim, the force of gravity, or a bent sapling's tension provides the power
141. The heart of any trap or snare is the trigger. When planning a trap or snare, what should you ask yourself?
  1. ask yourself how it should affect the prey, what is the source of power, and what will be the most efficient trigger. Your answers will help you devise a specific trap for a specific species.
142. What is a simple snare made from?
  1. A noose placed over a trail or den hole and attached to a firmly planted stake. If the noose is some type of cordage placed upright on a game trail, use small twigs or blades of grass to hold it up.
143. How do you make a drag snare or noose?
  1. Place forked sticks on either side of the run and lay a sturdy crossmember across them. Tie the noose to the crossmember and hang it at a height above the animal's head. (Nooses designed to catch by the head should never be low enough for the prey to step into with a foot.) As the noose tightens around the animal's neck, the animal pulls the crossmember from the forked sticks and drags it along. The surrounding vegetation quickly catches the crossmember and the animal becomes entangled.

144. What do you need to make a twitch-up?
1. a supple sapling, which, when bent over and secured with a triggering device, will provide power to a variety of snares. Select a hardwood sapling along the trail. A twitch-up will work much faster and with more force if you remove all the branches and foliage.
145. What does a simple twitch-up snare use? How do you make a twitch-up snare?
1. two forked sticks, each with a long and short leg (Figure 8-7). Bend the twitch-up and mark the trail below it. Drive the long leg of one forked stick firmly into the ground at that point. Ensure the cut on the short leg of this stick is parallel to the ground. Tie the long leg of the remaining forked stick to a piece of cordage secured to the twitch-up. Cut the short leg so that it catches on the short leg of the other forked stick. Extend a noose over the trail. Set the trap by bending the twitch-up and engaging the short legs of the forked sticks. When an animal catches its head in the noose, it pulls the forked sticks apart, allowing the twitch-up to spring up and hang the prey.
146. How do you make a squirrel pole?
1. long pole placed against a tree in an area showing a lot of squirrel activity (Figure 8-8). Place several wire nooses along the top and sides of the pole so that a squirrel trying to go up or down the pole will have to pass through one or more of them. Position the nooses (5 to 6 centimeters in diameter) about 2.5 centimeters off the pole. Place the top and bottom wire nooses 45 centimeters from the top and bottom of the pole to prevent the squirrel from getting its feet on a solid surface.
147. How do you make an Ojibwa bird pole?
1. snare used by native Americans for centuries (Figure 8-9). To be effective, place it in a relatively open area away from tall trees. For best results, pick a spot near feeding areas, dusting areas, or watering holes. Cut a pole 1.8 to 2.1 meters long and trim away all limbs and foliage. Do not use resinous wood such as pine. Sharpen the upper end to a point, then drill a small diameter hole 5 to 7.5 centimeters down from the top. Cut a small stick 10 to 15 centimeters long and shape one end so that it will almost fit into the hole. This is the perch. Plant the long pole in the ground with the pointed end up. Tie a small weight, about equal to the weight of the targeted species, to a length of cordage. Pass the free end of the cordage through the hole, and tie a slip noose that covers the perch. Tie a single overhand knot in the cordage and place the perch against the hole. Allow the cordage to slip through the hole until the overhand knot rests against the pole and the top of the perch. The tension of the overhand knot against the pole and perch will hold the perch in position. Spread the noose over the perch, ensuring it covers the perch and drapes over on both sides. Most birds prefer to rest on something above ground and will land on the perch. As soon as the bird lands, the perch will fall, releasing the over-hand knot and allowing the weight to drop.
148. How do you use a noosing wand?
1. useful for capturing roosting birds or small mammals (Figure 8-10). It requires a patient operator. This wand is more a weapon than a trap. It consists of a pole

(as long as you can effectively handle) with a slip noose of wire or stiff cordage at the small end. To catch an animal, you slip the noose over the neck of a roosting bird and pull it tight. You can also place it over a den hole and hide in a nearby blind. When the animal emerges from the den, you jerk the pole to tighten the noose and thus capture the animal. Carry a stout club to kill the prey.

149. What are examples of temperate zone food plants?
1. • Amaranth (*Amaranthus retroflexus* and other species)
  2. • Arrowroot (*Sagittaria* species)
  3. • Asparagus (*Asparagus officinalis*)
  4. • Beechnut (*Fagus* species)
  5. • Blackberries (*Rubus* species)
  6. • Blueberries (*Vaccinium* species)
  7. • Burdock (*Arctium lappa*)
  8. • Cattail (*Typha* species)
  9. • Chestnut (*Castanea* species)
  10. • Chicory (*Cichorium intybus*)
  11. • Chufa (*Cyperus esculentus*)
  12. • Dandelion (*Taraxacum officinale*)
  13. • Daylily (*Hemerocallis fulva*)
  14. • Nettle (*Urtica* species)
  15. • Oaks (*Quercus* species)
  16. • Persimmon (*Diospyros virginiana*)
  17. • Plantain (*Plantago* species)
  18. • Pokeweed (*Phytolacca americana*)
  19. • Prickly pear cactus (*Opuntia* species)
  20. • Purslane (*Portulaca oleracea*)
  21. • Sassafras (*Sassafras albidum*)
  22. • Sheep sorrel (*Rumex acetosella*)
  23. • Strawberries (*Fragaria* species)
  24. • Thistle (*Cirsium* species)
  25. • Water lily and lotus (*Nuphar*, *Nelumbo*, and other species)
  26. • Wild onion and garlic (*Allium* species)
  27. • Wild rose (*Rosa* species)
  28. • Wood sorrel (*Oxalis* species)
150. What are examples of Tropical Zone food Plants?
1. • Bamboo (*Bambusa* and other species)
  2. • Bananas (*Musa* species)
  3. • Breadfruit (*Artocarpus incisa*)
  4. • Cashew nut (*Anacardium occidentale*)
  5. • Coconut (*Cocos nucifera*)
  6. • Mango (*Mangifera indica*)
  7. • Palms (various species)
  8. • Papaya (*Carica* species)
  9. • Sugarcane (*Saccharum officinarum*)

10. • Taro (*Colocasia* species)
151. What are examples of desert zone food plants?
1. • Acacia (*Acacia farnesiana*)
  2. • Agave (*Agave* species)
  3. • Cactus (various species)
  4. • Date palm (*Phoenix dactylifera*)
  5. • Desert amaranth (*Amaranthus palmeri*)
  6. What seaweeds are edible? • Dulse (*Rhodomenia palmata*)
  7. • Green seaweed (*Ulva lactuca*)
  8. • Irish moss (*Chondrus crispus*)
  9. • Kelp (*Alaria esculenta*)
  10. • Laver (*Porphyra* species)
  11. • Mojaban (*Sargassum fulvellum*)
  12. • Sugar wrack (*Laminaria saccharina*)
152. What characteristics make fish inedible?
1. Looks spoiled
  2. Sunken eyes
  3. Suspicious color (Gills are red to pink)
  4. Dents stay in flesh after pressure
  5. Slimy, not wet body
  6. Sharp, peppery taste
153. What can spoiled, rotten fish cause?
1. Diarrhea
  2. Nausea
  3. Vomiting
  4. Itching
  5. Paralysis
  6. Metallic taste in mouth
154. What are all of the possible arrangements of leaves?
1. Opposite
  2. Alternate
  3. Compound
  4. Simple
  5. Basal rosette
155. What are the most common basic root structures?
1. Bulb
  2. Clove
  3. Taproot
  4. Tuber
  5. Rhizome
  6. Corm
  7. Crown
156. What are bulbs known as?
1. Onions

2. When cut in half, will show concentric rings
157. What are cloves?
  1. Bulb like structures
  2. Look like garlic when broken apart
158. What are taproots?
  1. Wild carrots
  2. May be single rooted or bundled, but only have one plant stalk that arises from each root
159. What are tubers?
  1. Potatoes and daylilies
  2. These structures can be found in strings or clusters under parent plants
160. What are Rhizomes?
  1. Large creeping rootstock
  2. Underground stems
  3. Many plants arise from the "eyes" of those roots
161. What are corms?
  1. Similar to bulbs, but solid when cut rather than possessing rings
162. What should you do before testing plants for edibility?
  1. Test only plants that are abundant in your area
  2. Even if food is safe, consume in moderation as eating large amounts of plants on an empty stomach can cause diarrhea and digestive issues
  3. empty stomach can cause diarrhea and digestive issues
163. To avoid potentially poisonous plants avoid plants with what characteristics?
  1. Milky or discolored sap
  2. Beans, bulbs, seeds inside of pods
  3. Bitter and soapy taste
  4. Spines, fine hairs, thorns
  5. Dill, carrot, parsley like foliage
  6. Almond Like Scent
  7. Grain heads with pink, purple, and black spurs
164. How do you smoke meat?
  1. Create an enclosure around a fire
  2. Use hardwoods to produce good smoke
  3. Cut meat into thin slices, less than 6 cm thick
  4. Don't let fire get too hot
  5. Drape meat over framework over the fire
  6. Properly smoked meat will look very dark
  7. Curled, brittle stick
165. Why should you consider use of plants in diet for survival?
  1. Learn about flora and fauna in the region you're working in
  2. Plants can work as medicine
  3. Plants can give you chemicals for poisoning fish, preserving hides, camouflage
166. Why may plants near urban areas be dangerous?
  1. Wash thoroughly

2. Avoid roadside plants due to vehicle emissions contaminating food
167. Plants growing in contaminated water are also contaminated. What does this mean?
  1. Avoid entirely if possible
  2. Boil or disinfect before eating
168. Plants of the same species may differ in toxic substances depending on their environment. What is a way to determine the toxicity of plants?
  1. Avoid weeds, leaves, or seeds with almond scent as it is a sign of cyanide
169. Some edible wild plants, like acorns and water lily rhizomes are bitter. How can you remove the bitterness?
  1. Boiling them in water will remove such properties
170. What are the basic leaf margins?
  1. Toothed
  2. Lobed
  3. Toothless
  4. Smooth
171. What are the basic leaf shapes?
  1. Lance shaped
  2. Elliptical
  3. Egg-shaped
  4. Oblong
  5. Wedge
  6. Triangular
  7. Long pointed
  8. Top shaped
172. What are the steps for skinning a snake?
  1. Cut off head and bury it
  2. Cut skin down 15-20 cm
  3. Peel skin back
  4. Grab skin in one hand, the body in the other
  5. Pull them apart
  6. Remove and discard entrails
173. How do you prepare birds for eating?
  1. Remove feathers by plucking or skinning
  2. Open up body cavity and remove the entrails
  3. Cut off feet and cook
  4. Scavenger birds should be cooked for more than 20 minutes to kill parasites
174. What is a method for skinning and butchering animals?
  1. Bleed animal by slitting its throat
  2. Place carcass belly up-split hide from throat to tail
  3. Cut around all sexual organs
175. How can you remove entrails for small game?
  1. Split body open and pull out entrails with fingers
176. How do you make a rabbit stick?
  1. Get a stout stick that is roughly an arms length

2. Can be thrown overhand or sidearm
  3. Effective against small game that freezes under stress
177. How do you properly use spears to hunt for wild game?
1. Spears can kill fish and small game
  2. Jab with the spear; do not throw
178. How do you make a bow?
1. Hardwood stick 1 meter long with no knots or limbs
  2. Dead dry wood is preferable to greenwood
  3. Pick arrows from straight dry sticks
  4. Arrows should be  $\frac{1}{2}$  as long as the bow
  5. Arrows can be straightened by heating shaft over hot coals
  6. Do not allow shaft to scorch
  7. Do not split arrows
179. What can arrow heads be made from?
1. Bone, glass, metal, rock
180. How do you make a sling?
1. Can be made from tying 2 pieces of cordage at opposite ends of a palm sized piece of leather
181. What can fishhooks be made from?
1. Can be made from bone, pins, needles, wire, wood, thorns, seashells
182. Can you use plants for medicine?
1. In a survival situation you will have to use what is available. In using plants and other natural remedies, positive identification of the plants involved is as critical as in using them for food. Proper use of these plants is equally important.
183. How do you use a poultice?
1. The name given to crushed leaves or other plant parts, possibly heated, that you apply to a wound or sore either directly or wrapped in cloth or paper.
184. How do you make tea from plants?
1. The preparation of medicinal herbs for internal or external application. You place a small quantity of a herb in a container, pour hot water over it, and let it steep (covered or uncovered) before use.
185. How do you make a decoction?
1. The extract of a boiled down or simmered herb leaf or root. You add herb leaf or root to water. You bring them to a sustained boil or simmer to draw their chemicals into the water. The average ratio is about 28 to 56 grams (1 to 2 ounces) of herb to 0.5 liter of water.
186. How do you make an expressed juice?
1. Liquids or saps squeezed from plant material and either applied to the wound or made into another medicine.
187. What plants can help stop diarrhea?
1. Drink tea made from the roots of blackberries and their relatives to stop diarrhea. White oak bark and other barks containing tannin are also effective. However, use them with caution when nothing else is available because of possible negative effects on the kidneys. You can also stop diarrhea by eating white clay



or campfire ashes. Tea made from cowberry or cranberry or hazel leaves works too.

188. What plants serve as antihemorrhagics?
  1. Make medications to stop bleeding from a poultice of the puffball mushroom, from plantain leaves, or most effectively from the leaves of the common yarrow or woundwort (*Achillea millefolium*).
189. What plants serve as antiseptics?
  1. Use to cleanse wounds, sores, or rashes. You can make them from the expressed juice from wild onion or garlic, or expressed juice from chickweed leaves or the crushed leaves of dock. You can also make antiseptics from a decoction of burdock root, mallow leaves or roots, or white oak bark. All these medications are for external use only.
190. What plants help cure fevers?
  1. Treat a fever with a tea made from willow bark, an infusion of elder flowers or fruit, linden flower tea, or elm bark decoction.
191. What plants help with colds and sore throats?
  1. Treat these illnesses with a decoction made from either plantain leaves or willow bark. You can also use a tea made from burdock roots, mallow or mullein flowers or roots, or mint leaves.
192. What plants help with aches, pains, and sprains?
  1. Treat with externally applied poultices of dock, plantain, chickweed, willow bark, garlic, or sorrel. You can also use salves made by mixing the expressed juices of these plants in animal fat or vegetable oils.
193. What plants help with itching?
  1. Relieve the itch from insect bites, sunburn, or plant poisoning rashes by applying a poultice of jewelweed (*Impatiens biflora*) or witch hazel leaves (*Hamamelis virginiana*). The jewelweed juice will help when applied to poison ivy rashes or insect stings. It works on sunburn as well as aloe vera.
194. What plants serve as sedatives?
  1. Get help in falling asleep by brewing a tea made from mint leaves or passionflower leaves.
195. What plants serve as hemorrhoids?
  1. Treat them with external washes from elm bark or oak bark tea, from the expressed juice of plantain leaves, or from a Solomon's seal root decoction.
196. What plants help with constipation?
  1. Relieve constipation by drinking decoctions from dandelion leaves, rose hips, or walnut bark. Eating raw daylily flowers will also help.
197. What plants help with worms or intestinal parasites?
  1. Using moderation, treat with tea made from tansy (*Tanacetum vulgare*) or from wild carrot leaves.
198. What plants help with gas and cramps?
  1. Use a tea made from carrot seeds as an antifatulent; use tea made from mint leaves to settle the stomach.

199. How can you make dyes from various plants to color clothing or to camouflage your skin?
1. Usually, you will have to boil the plants to get the best results. Onion skins produce yellow, walnut hulls produce brown, and pokeberries provide a purple dye.
200. How can you make fibers and cordage from plant fibers?
1. Most commonly used are the stems from nettles and milkweeds, yucca plants, and the inner bark of trees like the linden.
201. How can you make fish poison?
1. by immersing walnut hulls in a small area of quiet water. This poison makes it impossible for the fish to breathe but doesn't adversely affect their edibility.
202. What can you make tinder for starting fires from?
1. cattail fluff, cedar bark, lighter knot wood from pine trees, or hardened sap from resinous wood trees.
203. Make insulation by fluffing up:
1. female cattail heads or milkweed down.
204. What methods do plants use to poison ou?
1. Ingestion. When a person eats a part of a poisonous plant.
  2. • Contact. When a person makes contact with a poisonous plant that causes any type of skin
  3. irritation or dermatitis.
  4. • Absorption or inhalation. When a person either absorbs the poison through the skin or inhales it into the respiratory system.
205. Why is it difficult to say how poisonous plants are?
1. • Some plants require contact with a large amount of the plant before noticing any adverse reaction
  2. while others will cause death with only a small amount.
  3. • Every plant will vary in the amount of toxins it contains due to different growing conditions and
  4. slight variations in subspecies.
  5. • Every person has a different level of resistance to toxic substances.
  6. • Some persons may be more sensitive to a particular plant.
206. What are some common misconceptions about poisonous plants?
1. • Watch the animals and eat what they eat. Most of the time this statement is true, but some
  2. animals can eat plants that are poisonous to humans.
  3. • Boil the plant in water and any poisons will be removed. Boiling removes many poisons, but not all.
  4. • Plants with a red color are poisonous. Some plants that are red are poisonous, but not all.
207. Why is it your benefit to learn as much about plants as possible?
1. Many poisonous plants look like their edible relatives or like other edible plants. For example, poison hemlock appears very similar to wild carrot. Certain plants are safe to eat in certain seasons or stages of growth and poisonous in other

stages. For example, the leaves of the pokeweed are edible when it first starts to grow, but it soon becomes poisonous.

208. Some plants become toxic after wilting. What are examples of some plants that become toxic after wilting?
1. For example, when the black cherry starts to wilt, hydrocyanic acid develops. Specific preparation methods make some plants edible that are poisonous raw. You can eat the thinly sliced and thoroughly dried corms (drying may take a year) of the jack-in-the-pulpit, but they are poisonous if not thoroughly dried.
209. Your best policy is to be able to look at a plant and identify it with absolute certainty and to know its uses or dangers. Many times this is not possible. If you have little or no knowledge of the local vegetation, use the rules to select plants for the "Universal Edibility Test." Remember, avoid --
1. • All mushrooms. Mushroom identification is very difficult and must be precise, even more so than with other plants. Some mushrooms cause death very quickly. Some mushrooms have no known antidote. Two general types of mushroom poisoning are gastrointestinal and central nervous system.
  2. • Contact with or touching plants unnecessarily.
210. What plant related ailment usually causes the most trouble in the field?
1. Contact Dermatitis. The effects may be persistent, spread by scratching, and are particularly dangerous if there is contact in or around the eyes. The principal toxin of these plants is usually an oil that gets on the skin upon contact with the plant. The oil can also get on equipment and then infect whoever touches the equipment.
211. Why should you never bum a contact poisonous plant?
1. You are more susceptible to the effects of the plant through smoke.
  2. There is a greater danger of being affected when overheated and sweating. The infection may be local or it may spread over the body. Symptoms may take from a few hours to several days to appear. Signs and symptoms can include burning, reddening, itching, swelling, and blisters.
  3. Poisonous plants that cause contact dermatitis are--
212. What are poisonous plants that cause contact dermatitis?
1. • Cowhage.
  2. • Poison ivy.
  3. • Poison oak.
  4. • Poison sumac.
  5. • Rengas tree.
  6. • Trumpet vine.
213. What should you do when you first contact the poisonous plants or the first symptoms appear?
1. try to remove the oil by washing with soap and cold water. If water is not available, wipe your skin repeatedly with dirt or sand. Do not use dirt if blisters have developed. The dirt may break open the blisters and leave the body open to infection. After you have removed the oil, dry the area. You can wash with a

tannic acid solution and crush and rub jewelweed on the affected area to treat plant-caused rashes. You can make tannic acid from oak bark.

214. What plants cause ingestion poisoning if eaten?
1. • Castor bean.
  2. • Chinaberry.
  3. • Death camas.
  4. • Lantana.
  5. • Manchineel.
  6. • Oleander.
  7. • Pangi.
  8. • Physic nut.
  9. • Poison and water hemlocks.
  10. • Rosary pea.
  11. • Strychnine tree.
215. Ingestion poisoning can be very serious and could lead to death very quickly. What does this mean for you?
1. Do not eat any plant unless you have positively identified it first. Keep a log of all plants eaten.
216. What can signs and symptoms of ingestion poisoning include?
1. nausea, vomiting, diarrhea, abdominal cramps, depressed heartbeat and respiration, headaches, hallucinations, dry mouth, unconsciousness, coma, and death.
217. What should you do if you think you have plant poisoning?
1. If you suspect plant poisoning, try to remove the poisonous material from the victim's mouth and stomach as soon as possible. Induce vomiting by tickling the back of his throat or by giving him warm saltwater, if he is conscious. Dilute the poison by administering large quantities of water or milk, if he is conscious.
218. How do you recognize insects?
1. You recognize and identify insects, except centipedes and millipedes, by their six legs while arachnids have eight. All these small creatures become pests when they bite, sting, or irritate you. Although their venom can be quite painful, bee, wasp, and hornet stings rarely kill a survivor unless he is allergic to that particular toxin.
219. Even the most dangerous spiders rarely kill, and the effects of tick-borne diseases are very slow-acting. What is the strategy for dealing with insects?
1. In all cases, avoidance is the best defense. In environments known to have spiders and scorpions, check your footgear and clothing every morning. Also check your bedding and shelter for them. Use care when turning over rocks and logs. You find scorpions (*Buthotus* species) in deserts, jungles, and forests of tropical, subtropical, and warm temperate areas of the world. They are mostly nocturnal in habit. You can find desert scorpions from below sea level in Death Valley to elevations as high as 3,600 meters in the Andes.
220. Fatalities from scorpion stings are rare, but they can occur in what human demographics?

1. children, the elderly, and ill persons.
221. How do you recognize the brown recluse or fiddleback spider?
1. You recognize the brown recluse or fiddleback spider of North America (*Loxosceles reclusa*) by a prominent violin-shaped light spot on the back of its body. As its name suggests, this spider likes to hide in dark places. Though rarely fatal, its bite causes excessive tissue degeneration around the wound and can even lead to amputation of the digits if left untreated.
222. How do you recognize a black widow spider?
1. You find members of the widow family (*Latrodectus* species) worldwide, though the black widow of North America is perhaps the most well-known. (*Latrodectus* species) worldwide, though the black widow of North America is perhaps the most well-known. Found in warmer areas of the world, the widows are small, dark spiders with often hourglass-shaped white, red, or orange spots on their abdomens.
223. What are Funnelwebs (*Atrax* species)?
1. large, gray or brown Australian spiders. Chunky, with short legs, they
  2. are able to move easily up and down the cone-shaped webs from which they get their name. The local populace considers them deadly. Avoid them as they move about, usually at night, in search of prey. Symptoms of their bite are similar to those of the widow's--severe pain accompanied by sweating and shivering, weakness, and disabling episodes that can last a week.
224. How are tarantulas recognized?
1. Tarantulas are large, hairy spiders (*Theraphosidae* and *Lycosa* species) best known because they are often sold in pet stores. There is one species in Europe, but most come from tropical America. Some South American species do inject a dangerous toxin, but most simply produce a painful bite. Some tarantulas can be as large as a dinner plate. They all have large fangs for capturing food such as birds, mice, and lizards. If bitten by a tarantula, pain and bleeding are certain, and infection is likely.
225. Centipedes and millipedes are mostly small and harmless, although some tropical and desert species may reach 25 centimeters.
1. A few varieties of centipedes have a poisonous bite, but infection is the greatest danger, as their sharp claws dig in and puncture the skin. To prevent skin punctures, brush them off in the direction they are traveling, if you find them crawling on your skin.
226. What is the main danger from bees?
1. barbed stinger located on their abdomens. When the bee stings you, it rips its stinger out of its abdomen along with the venom sac, and the bee dies. Except for killer bees, most bees tend to be more docile than wasps, hornets, and yellow jackets that have smooth stingers and are capable of repeated attacks.
227. What is the best tactic for self-protection from insects?
1. Avoidance.
  2. Watch out for flowers or fruit where bees may be feeding. Be careful of meat-eating yellow jackets when cleaning fish or game. The average person has

a relatively minor and temporary reaction to bee stings and recovers in a couple of hours when the pain and headache go away. Those who are allergic to bee venom have severe reactions including anaphylactic shock, coma, and death. If antihistamine medicine is not available and you cannot find a substitute, an allergy sufferer in a survival situation is in grave danger.

228. Ticks are common in the tropics and temperate regions. They are familiar to most of us. How can they be identified?
1. Ticks are small round arachnids with eight legs and can have either a soft or hard body.
229. What do ticks need to survive and reproduce?
230. According to most authorities, how long does it take for ticks to transmit disease?
1. 6 hours of attachment to the host for the tick to transmit the disease organisms. Thus, you have time to thoroughly inspect your body for their presence. Beware of ticks when passing through the thick vegetation they cling to, when cleaning host animals for food, and when gathering natural materials to construct a shelter. Always use insect repellents, if possible.
  2. Ticks require a blood host to survive and reproduce. How does this make them dangerous? This makes them dangerous because they spread diseases like Lyme disease, Rocky Mountain spotted fever, encephalitis, and others that can ultimately be disabling or fatal. There is little you can do to treat these diseases once contracted, but time is your ally since they are slow-acting ailments.
231. What are the poisonous snakes of America?
1. • American Copperhead (*Agkistrodon contortrix*)
  2. • Bushmaster (*Lachesis mutus*)
  3. • Coral snake (*Micrurus fulvius*)
  4. • Cottonmouth (*Agkistrodon piscivorus*)
  5. • Fer-de-lance (*Bothrops atrox*)
  6. • Rattlesnake (*Crotalus* species)
232. What are the poisonous snakes of Europe?
1. • Common adder (*Vipera berus*)
  2. • Pallas' viper (*Agkistrodon halys*)
233. What are the poisonous snakes of Africa and Asia?
1. • Boomslang (*Dispholidus typus*)
  2. • Cobra (*Naja* species)
  3. • Gaboon viper (*Bitis gabonica*)
  4. • Green tree pit viper (*Trimeresurus gramineus*)
  5. • Habu pit viper (*Trimeresurus flavoviridis*)
  6. • Krait (*Bungarus caeruleus*)
  7. • Malayan pit viper (*Callaselasma rhodostoma*)
  8. • Mamba (*Dendraspis* species)
  9. • Puff adder (*Bitis arietans*)
  10. • Rhinoceros viper (*Bitis nasicornis*)
  11. • Russell' s viper (*Vipera russellii*)
  12. • Sand viper (*Cerastes vipera*)

13. • Saw-scaled viper (*Echis carinatus*)
14. • Wagler's pit viper (*Trimeresurus wagleri*)
- 15.
- 16.
- 17.
234. What are the poisonous snakes of Australasia?
  1. • Death adder (*Acanthophis antarcticus*)
  2. • Taipan (*Oxyuranus scutellatus*)
  3. • Tiger snake (*Notechis scutatus*)
  4. • Yellow-bellied sea snake (*Pelamis platurus*)
235. What are the characteristics of the Gila Monster?
  1. The Gila monster (*Heloderma suspectum*) of the American southwest, including Mexico, is a large lizard with dark, highly textured skin marked by pinkish mottling. It averages 35 to 45 centimeters in length and has a thick, stumpy tail. Unlikely to bite unless molested, it has a poisonous bite.
236. What are the characteristics of the Mexican Beaded Lizard?
  1. The Mexican beaded lizard (*Heloderma horridum*) resembles its relative, the Gila monster. It has more uniform spots rather than bands of color (the Gila monster). It also is poisonous and has a docile nature. You find it from Mexico to Central America.
237. What are the characteristics of the Komodo Dragon?
  1. This giant lizard (*Varanus komodoensis*) grows to more than 3 meters in length and can be dangerous if you try to capture it. This Indonesian lizard can weigh more than 135 kilograms.
238. What are the characteristics of the Electric Eel?
  1. Electric eels (*Electrophorus electricus*) may reach 2 meters in length and 20 centimeters in diameter. Avoid them. They are capable of generating up to 500 volts of electricity in certain organs in their body. They use this shock to stun prey and enemies. Their upper body is dark gray or black, with a lighter-colored underbelly.
239. What are the characteristics of the Piranha?
  1. Piranhas (*Serrasalmo* species) are another hazard of the Orinoco and Amazon River systems, as well as the Paraguay River Basin, where they are native. These fish vary greatly in size and coloration, but usually have a combination of orange undersides and dark tops. They have white, razor-sharp teeth that are clearly visible. They may be as long as 50 centimeters. Use great care when crossing waters where they live. Blood attracts them. They are most dangerous in shallow waters during the dry season.
240. What are the characteristics of the Turtle?
  1. Be careful when handling and capturing large freshwater turtles, such as the snapping turtles and soft-shelled turtles of North America and the matamata and other turtles of South America. All of these turtles will bite in self-defense and can amputate fingers and toes.
241. What are the characteristics of the Platypus?

1. Growing up to 60 centimeters in length, it may appear to be a good food source, but this egg-laying mammal, the only one in the world, is very dangerous. The male has a poisonous spur on each hind foot that can inflict intensely painful wounds. You find the platypus only in Australia, mainly along mud banks on waterways. It has a long body covered with grayish, short hair, a tail like a beaver, and a bill like a duck.
242. In shallow salt waters, there are many creatures that can inflict pain and cause infection to develop. What are some examples of these creatures?
  1. Stepping on sea urchins, for example, can produce pain and infection. When moving about in shallow water, wear some form of footgear and shuffle your feet along the bottom, rather than picking up your feet and stepping.
243. Stingrays (*Dasyatidae* species) are a real hazard in shallow waters, especially tropical waters. What does this mean for you?
  1. The type of bottom appears to be irrelevant. There is a great variance between species, but all have a sharp spike in their tail that may be venomous and can cause extremely painful wounds if stepped on. All rays have a typical shape that resembles a kite. You find them along the coasts of the Americas, Africa, and Australasia.
244. How do sharks impact your survival in the water?
  1. Sharks are the most feared animal in the sea. Usually, shark attacks cannot be avoided and are considered accidents. You, as a survivor, should take every precaution to avoid any contact with sharks. There are many shark species, but in general, dangerous sharks have wide mouths and visible teeth, while relatively harmless ones have small mouths on the underside of their heads. However, any shark can inflict painful and often fatal injuries, either through bites or through abrasions from their rough skin.
245. How do rabbitfish impact your survival in the water?
  1. Rabbitfish or spinefoot (*Siganidae* species) occur mainly on coral reefs in the Indian and Pacific oceans. They have very sharp, possibly venomous spines in their fins. Handle them with care, if at all. This fish, like many others of the dangerous fish in this section, is considered edible by native peoples where the fish are found, but deaths occur from careless handling. Seek other nonpoisonous fish to eat if at all possible.
246. What are Tang? How do they impact your survival of the water?
  1. Tang or surgeonfish (*Acanthuridae* species) average 20 to 25 centimeters in length and often are beautifully colored. They are called surgeonfish because of the scalpellike spines located in the tail. The wounds inflicted by these spines can bring about death through infection, envenomation, and loss of blood, which may incidentally attract sharks.
247. What are Toadfish? How do they impact your survival of the water?
  1. Toadfish (*Batrachoididae* species) occur in tropical waters off the Gulf Coast of the United States and along both coasts of Central and South America. These dully colored fish average 18 to 25 centimeters in length. They typically bury



themselves in the sand to await fish and other prey. They have sharp, very toxic spines along their backs.

248. What are Scorpion Fish? How do they impact your survival of the water?
1. Poisonous scorpion fish or zebra fish (*Scorpaenidae* species) are mostly around reefs in the tropical Indian and Pacific oceans and occasionally in the Mediterranean and Aegean seas. They average 30 to 75 centimeters in length. Their coloration is highly variable, from reddish brown to almost purple or brownish yellow. They have long, wavy fins and spines and their sting is intensively painful. Less poisonous relatives live in the Atlantic Ocean.
249. What are stonefish? How do they impact your survival of the water?
1. Stonefish (*Synanceja* species) are in the Pacific and Indian oceans. They can inject a painful venom from their dorsal spines when stepped on or handled carelessly. They are almost impossible to see because of their lumpy shape and drab colors. They range in size up to 40 centimeters.
250. What are Weever Fish? How do they impact your survival of the water?
1. Weever fish (*Trachinidae* species) average 30 centimeters long. They are hard to see as they lie buried in the sand off the coasts of Europe, Africa, and the Mediterranean. Their color is usually a dull brown. They have venomous spines on the back and gills.
251. What are Blowfish? How do they impact your survival of the water?
1. Blowfish or puffer (*Tetraodontidae* species) are more tolerant of cold water. You find them along tropical and temperate coasts worldwide, even in some of the rivers of Southeast Asia and Africa. Stout-bodied and round, many of these fish have short spines and can inflate themselves into a ball when alarmed or agitated. Their blood, liver, and gonads are so toxic that as little as 28 milligrams (1 ounce) can be fatal. These fish vary in color and size, growing up to 75 centimeters in length.
252. What are Triggerfish? How do they impact your survival of the water?
1. The triggerfish (*Balistidae* species) occur in great variety, mostly in tropical seas. They are deep-bodied and compressed, resembling a seagoing pancake up to 60 centimeters in length, with large and sharp dorsal spines. Avoid them all, as many have poisonous flesh.
253. What are Barracuda? How do they impact your survival of the water?
1. Although most people avoid them because of their ferocity, they occasionally eat barracuda (*Sphyraena barracuda*). These predators of mostly tropical seas can reach almost 1.5 meters in length and have attacked humans without provocation. They occasionally carry the poison ciguatera in their flesh, making them deadly if consumed.
254. What are Blue-Ringed Octopus? How do they impact your survival of the water?
1. Most octopi are excellent when properly prepared. However, the blueringed octopus (*Hapalochlaena lunulata*) can inflict a deadly bite from its parrotlike beak. Fortunately, it is restricted to the Great Barrier Reef of Australia and is very small. It is easily recognized by its grayish white overall color and iridescent blue rings.

Authorities warn that all tropical octopus species should be treated with caution, since many have poisonous bites, although the flesh is edible.

255. What are jellyfish? How do they impact your survival of the water?
1. Jellyfish-related deaths are rare, but the sting they inflict is extremely painful. The Portuguese man-of-war resembles a large pink or purple balloon floating on the sea. It has poisonous tentacles hanging up to 12 meters below its body. The huge tentacles are actually colonies of stinging cells. Most known deaths from jellyfish are attributed to the man-of-war. Other jellyfish can inflict very painful stings as well. Avoid the long tentacles of any jellyfish, even those washed up on the beach and apparently dead.
256. What are Auger Shells? How do they impact your survival of the water?
1. The auger shell or terebra (Terebridae species) are much longer and thinner than the cone shells, but can be nearly as deadly as the cone shells. They are found in temperate and tropical seas. Those in the Indian and Pacific oceans have a more toxic venom in their stinging barb. Do not eat these snails, as their flesh may be poisonous.
257. What are Cone shells? How do they impact your survival of the water?
1. The subtropical and tropical cone shells (Conidae species) have a venomous harpoonlike barb. All are cone-shaped and have a fine netlike pattern on the shell. A membrane may possibly obscure this coloration. There are some very poisonous cone shells, even some lethal ones in the Indian and Pacific oceans. Avoid any shell shaped like an ice cream cone.
258. How are clubs supposed to be used in a survival situation?
1. You hold clubs, you do not throw them. As a field-expedient weapon, the club does not protect you from enemy soldiers. It can, however, extend your area of defense beyond your fingertips. It also serves to increase the force of a blow without injuring yourself. There are three basic types of clubs. They are the simple, weighted, and sling club.
259. How can you make a simple club?
1. A simple club is a staff or branch. It must be short enough for you to swing easily, but long enough and strong enough for you to damage whatever you hit. Its diameter should fit comfortably in your palm, but it should not be so thin as to allow the club to break easily upon impact. A straight-grained hardwood is best if you can find it.
260. What is a weighted club and how are they to be used?
1. A weighted club is any simple club with a weight on one end. The weight may be a natural weight, such as a knot on the wood, or something added, such as a stone lashed to the club.
261. What is a sling club and how are they made?
1. A sling club is another type of weighted club. A weight hangs 8 to 10 centimeters from the handle by a strong, flexible lashing (Figure 12-2). This type of club both extends the user's reach and multiplies the force of the blow.
262. What are a knife's three functions?

1. A knife has three basic functions. It can puncture, slash or chop, and cut. A knife is also an invaluable tool used to construct other survival items. You may find yourself without a knife or you may need another type knife or a spear. To improvise you can use stone, bone, wood, or metal to make a knife or spear blade.
263. How do you make a stone knife?
1. To make a stone knife, you will need a sharp-edged piece of stone, a chipping tool, and a flaking tool. A chipping tool is a light, blunt-edged tool used to break off small pieces of stone. A flaking tool is a pointed tool used to break off thin, flattened pieces of stone. You can make a chipping tool from wood, bone, or metal, and a flaking tool from bone, antler tines, or soft iron
  2. Start making the knife by roughing out the desired shape on your sharp piece of stone, using the chipping tool. Try to make the knife fairly thin. Then, using the flaking tool, press it against the edges. This action will cause flakes to come off the opposite side of the edge, leaving a razor sharp edge. Use the flaking tool along the entire length of the edge you need to sharpen. Eventually, you will have a very sharp cutting edge that you can use as a knife.
264. What are the pros and cons of stone knives?
1. Stone will make an excellent puncturing tool and a good chopping tool but will not hold a fine edge. Some stones such as chert or flint can have very fine edges.
265. How do you make a bone knife?
1. You can also use bone as an effective field-expedient edged weapon. First, you will need to select a suitable bone. The larger bones, such as the leg bone of a deer or another medium-sized animal, are best. Lay the bone upon another hard object. Shatter the bone by hitting it with a heavy object, such as a rock. From the pieces, select a suitable pointed splinter. You can further shape and sharpen this splinter by rubbing it on a rough-surfaced rock. If the piece is too small to handle, you can still use it by adding a handle to it. Select a suitable piece of hardwood for a handle and lash the bone splinter securely to it.
266. Why should you use bone knives only to puncture?
1. It will not hold an edge and it may flake or break if used differently.
267. How do you make spears?
1. To make spears, use the same procedures to make the blade that you used to make a knife blade. Then select a shaft (a straight sapling) 1.2 to 1.5 meters long. The length should allow you to handle the spear easily and effectively. Attach the spear blade to the shaft using lashing. The preferred method is to split the handle, insert the blade, then wrap or lash it tightly. You can use other materials without adding a blade. Select a 1.2-to 1.5-meter long straight hardwood shaft and shave one end to a point. If possible, fire harden the point. Bamboo also makes an excellent spear. Select a piece 1.2 to 1.5 meters long.
268. How do you make an arrow point?
1. To make an arrow point, use the same procedures for making a stone knife blade. Chert, flint, and shell-type stones are best for arrow points. You can

fashion bone like stone--by flaking. You can make an efficient arrow point using broken glass.

269. The bola is another field-expedient weapon that is easy to make. It is especially effective for capturing running game or low-flying fowl in a flock. How do you use a bola?
1. To use the bola, hold it by the center knot and twirl it above your head. Release the knot so that the bola flies toward your target. When you release the bola, the weighted cords will separate. These cords will wrap around and immobilize the fowl or animal that you hit.
270. What are some considerations when making cordage?
1. Before making cordage, there are a few simple tests you can do to determine you material's suitability. First, pull on a length of the material to test for strength. Next, twist it between your fingers and roll the fibers together. If it withstands this handling and does not snap apart, tie an overhand knot with the fibers and gently tighten. If the knot does not break, the material is usable. Figure 12-8 shows various methods of making cordage.
271. You can shred and braid plant fibers from the inner bark of some trees to make cord. What trees produce great plant fibers?
1. You can use the linden, elm, hickory, white oak, mulberry, chestnut, and red and white cedar trees. After you make the cord, test it to be sure it is strong enough for your purpose. You can make these materials stronger by braiding several strands together.
272. You can use rawhide for larger lashing jobs. How do you make rawhide?
1. Make rawhide from the skins of medium or large game. After skinning the animal, remove any excess fat and any pieces of meat from the skin. Dry the skin completely. You do not need to stretch it as long as there are no folds to trap moisture. You do not have to remove the hair from the skin. Cut the skin while it is dry. Make cuts about 6 millimeters wide. Start from the center of the hide and make one continuous circular cut, working clockwise to the hide's outer
  2. edge. Soak the rawhide for 2 to 4 hours or until it is soft. Use it wet, stretching it as much as possible while applying it. It will be strong and durable when it dries.
273. How do you make a Horseshoe Pack?
1. This pack is simple to make and use and relatively comfortable to carry over one shoulder. Lay available square-shaped material, such as poncho, blanket, or canvas, flat on the ground. Lay items on one edge of the material. Pad the hard items. Roll the material (with the items) toward the opposite edge and tie both ends securely. Add extra ties along the length of the bundle. You can drape the pack over one shoulder with a line connecting the two ends (Figure 12-9).
274. How do you make a Square Pack?
1. This pack is easy to construct if rope or cordage is available. Otherwise, you must first make cordage. To make this pack, construct a square frame from bamboo, limbs, or sticks. Size will vary for each person and the amount of equipment carried (Figure 12-10).
275. How can a Parachute Assembly be used as a survival resource?

1. Consider the entire parachute assembly as a resource. Use every piece of material and hardware, to include the canopy, suspension lines, connector snaps, and parachute harness. Before disassembling the parachute, consider all of your survival requirements and plan to use different portions of the parachute accordingly. For example, consider shelter requirements, need for a rucksack, and so on, in addition to clothing or insulation needs.
276. How can animal skins help you in a survival situation?
  1. The selection of animal skins in a survival situation will most often be limited to what you manage to trap or hunt. However, if there is an abundance of wildlife, select the hides of larger animals with heavier coats and large fat content. Do not use the skins of infected or diseased animals if at all possible. Since they live in the wild, animals are carriers of pests such as ticks, lice, and fleas.
277. How can Plant Fibers be used as a source of insulation?
  1. Several plants are sources of insulation from cold. Cattail is a marshland plant found along lakes, ponds, and the backwaters of rivers. The fuzz on the tops of the stalks forms dead air spaces and makes a good down-like insulation when placed between two pieces of material. Milkweed has pollen like seeds that act as good insulation. The husk fibers from coconuts are very good for weaving ropes and, when dried, make excellent tinder and insulation.
278. How can you make Bowls from natural materials?
  1. Use wood, bone, horn, bark, or other similar material to make bowls. To make wooden bowls, use a hollowed out piece of wood that will hold your food and enough water to cook it in. Hang the wooden container over the fire and add hot rocks to the water and food. Remove the rocks as they cool and add more hot rocks until your food is cooked.
279. How can you make Forks, Knives, and Spoons from natural materials?
  1. Carve forks, knives, and spoons from nonresinous woods so that you do not get a wood resin aftertaste or do not taint the food. Nonresinous woods include oak, birch, and other hardwood trees.
280. Most arid areas have several types of terrain. What are the five basic desert terrain types?
  1. • Mountainous (High Altitude).
  2. • Rocky plateau.
  3. • Sand dunes.
  4. • Salt marshes.
  5. • Broken, dissected terrain ("gebel" or "wadi").
281. How does Desert terrain makes movement difficult and demanding?
  1. Land navigation will be extremely difficult as there may be very few landmarks. Cover and concealment may be very limited; therefore, the threat of exposure to the enemy remains constant.
282. What are characteristics of Mountain Deserts?
  1. Scattered ranges or areas of barren hills or mountains separated by dry, flat basins characterize mountain deserts. High ground may rise gradually or abruptly from flat areas to several thousand meters above sea level. These floodwaters

erode deep gullies and ravines and deposit sand and gravel around the edges of the basins. Water rapidly evaporates, leaving the land as barren as before, although there may be short-lived vegetation. If enough water enters the basin to compensate for the rate of evaporation, shallow lakes may develop, such as the Great Salt Lake in Utah, or the Dead Sea. Most of these lakes have a high salt content.

283. What are characteristics of Rocky Plateau Deserts?
1. Rocky plateau deserts have relatively slight relief interspersed with extensive flat areas with quantities of solid or broken rock at or near the surface. There may be steep-walled, eroded valleys, known as wadis in the Middle East and arroyos or canyons in the United States and Mexico.
284. What are characteristics of Sandy or Dune Deserts?
1. Sandy or dune deserts are extensive flat areas covered with sand or gravel. "Flat" is a relative term, as some areas may contain sand dunes that are over 300 meters high and 16 to 24 kilometers long. Trafficability in such terrain will depend on the windward or leeward slope of the dunes and the texture of the sand. Other areas, however, may be flat for 3,000 meters and more. Plant life may vary from none to scrub over 2 meters high. Examples of this type of desert include the edges of the Sahara, the empty quarter of the Arabian Desert, areas of California and New Mexico, and the Kalahari in South Africa.
285. What are characteristics of Salt Marshes?
1. Salt marshes are flat, desolate areas, sometimes studded with clumps of grass but devoid of other vegetation. They occur in arid areas where rainwater has collected, evaporated, and left large deposits of alkali salts and water with a high salt concentration. The water is so salty it is undrinkable. These areas usually support many insects, most of which bite. Avoid salt marshes. This type of terrain is highly corrosive to boots, clothing, and skin. A good example is the Shat-el-Arab waterway along the Iran-Iraq border.
286. What are characteristics of Broken Terrain?
1. All arid areas contain broken or highly dissected terrain. Rainstorms that erode soft sand and carve out canyons form this terrain. A wadi may range from 3 meters wide and 2 meters deep to several hundred meters wide and deep.
287. In a desert area what are the seven environmental factors that you must consider?
1. • Low rainfall.
  2. • Intense sunlight and heat.
  3. • Wide temperature range.
  4. • Sparse vegetation.
  5. • High mineral content near ground surface.
  6. • Sandstorms.
  7. • Mirages.
288. Low Rainfall
1. Low rainfall is the most obvious environmental factor in an arid area. Some desert areas receive less than 10 centimeters of rain annually, and this rain comes in brief torrents that quickly run off the ground surface. You cannot survive

long without water in high desert temperatures. In a desert survival situation, you must first consider "How much water do I have?" and "Where are other water sources?"

289. Intense Sunlight and Heat

1. Intense sunlight and heat are present in all arid areas. Air temperature can rise as high as 60 degrees C (140 degrees F) during the day. Heat gain results from direct sunlight, hot blowing winds, reflective heat (the sun's rays bouncing off the sand), and conductive heat from direct contact with the desert sand and rock (Figure 13-1).

290. Wide Temperature Range

1. Temperatures in arid areas may get as high as 55 degrees C during the day and as low as 10 degrees C during the night. The drop in temperature at night occurs rapidly and will chill a person who lacks warm clothing and is unable to move about. The cool evenings and nights are the best times to work or travel. If your plan is to rest at night, you will find a wool sweater, long underwear, and a wool stocking cap extremely helpful.

291. If traveling in hostile territory, follow the principles of desert camouflage. What are they?

1. • Hide or seek shelter in dry washes (wadis) with thicker growths of vegetation and cover from oblique observation.
2. • Use the shadows cast from brush, rocks, or outcroppings. The temperature in shaded areas will be 11 to 17 degrees C cooler than the air temperature.
3. • Cover objects that will reflect the light from the sun. Before moving, survey the area for sites that provide cover and concealment. You will have trouble estimating distance. The emptiness of desert terrain causes most people to underestimate distance by a factor of three: What appears to be 1 kilometer away is really 3 kilometers away.

292. How do areas with High Mineral Content impact your operations in desert environments?

1. All arid regions have areas where the surface soil has a high mineral content (borax, salt, alkali, and lime). Material in contact with this soil wears out quickly, and water in these areas is extremely hard and undrinkable. Wetting your uniform in such water to cool off may cause a skin rash. The Great Salt Lake area in Utah is an example of this type of mineral-laden water and soil. There is little or no plant life; therefore, shelter is hard to find. Avoid these areas if possible.

293. How do Sandstorms impact your survival in the desert?

1. The greatest danger is getting lost in a swirling wall of sand. Wear goggles and cover your mouth and nose with cloth. If natural shelter is unavailable, mark your direction of travel, lie down, and sit out the storm. Dust and wind-blown sand interfere with radio transmissions. Therefore, be ready to use other means for signaling, such as pyrotechnics, signal mirrors, or marker panels, if available.

294. How can Mirages impact desert operations?

1. Mirages are optical phenomena caused by the refraction of light through heated air rising from a sandy or stony surface. They occur in the interior of the desert

about 10 kilometers from the coast. They make objects that are 1.5 kilometers or more away appear to move. This mirage effect makes it difficult for you to identify an object from a distance. It also blurs distant range contours so much that you feel surrounded by a sheet of water from which elevations stand out as The mirage effect makes it hard for a person to identify targets, estimate range, and see objects clearly. However, if you can get to high ground (3 meters or more above the desert floor), you can get above the superheated air close to the ground and overcome the mirage effect. Mirages make land navigation difficult because they obscure natural features. You can survey the area at dawn, dusk, or by moonlight when there is little likelihood of mirage.

295. Light levels in desert areas are more intense than in other geographic areas. How does this affect operations in desert areas?
1. Moonlit nights are usually crystal clear, winds die down, haze and glare disappear, and visibility is excellent. You can see lights, red flash-lights, and blackout lights at great distances. Sound carries very far.
296. Conversely, during nights with little moonlight, visibility is extremely poor. Why is traveling at night dangerous in desert environments?
1. You must avoid getting lost, falling into ravines, or stumbling into enemy positions. Movement during such a night is practical only if you have a compass and have spent the day in a shelter, resting, observing and memorizing the terrain, and selecting your route.
297. What is a key factor of survival in desert environments?
1. Understanding the relationship between physical activity, air temperature, and water consumption. The body requires a certain amount of water for a certain level of activity at a certain temperature. For example, a person performing hard work in the sun at 43 degrees C requires 19 liters of water daily. Lack of the required amount of water causes a rapid decline in an individual's ability to make decisions and to perform tasks efficiently.
298. Your body's normal temperature is 36.9 degrees C (98.6 degrees F). How does it maintain this temperature in hot environments?
1. Your body gets rid of excess heat (cools off) by sweating. The warmer your body becomes--whether caused by work, exercise, or air temperature--the more you sweat. The more you sweat, the more moisture you lose. Sweating is the principal cause of water loss. If a person stops sweating during periods of high air temperature and heavy work or exercise, he will quickly develop heat stroke. This is an emergency that requires immediate medical attention.
299. Understanding how the air temperature and your physical activity affect your water requirements allows you to take measures to get the most from your water supply. What are these measures?
1. • Find shade! Get out of the sun!
  2. • Place something between you and the hot ground.
  3. • Limit your movements!
  4. • Conserve your sweat. Wear your complete uniform to include T-shirt. Roll the sleeves down, cover your head, and protect your neck with a scarf or similar



item. These steps will protect your body from hot-blowing winds and the direct rays of the sun. Your clothing will absorb your sweat, keeping it against your skin so that you gain its full cooling effect. By staying in the shade quietly, fully clothed, not talking, keeping your mouth closed, and breathing through your nose, your water requirement for survival drops dramatically.

5. • If water is scarce, do not eat. Food requires water for digestion; therefore, eating food will use water that you need for cooling.
300. Is Thirst a reliable guide for your need for water?
1. No. A person who uses thirst as a guide will drink only two-thirds of his daily water requirement. At temperatures below 38 degrees C, drink 0.5 liter of water every hour.
  2. • At temperatures above 38 degrees C, drink 1 liter of water every hour.
301. What are heat cramps caused by? What are the symptoms? How is it treated?
1. The loss of salt due to excessive sweating causes heat cramps. Symptoms are moderate to severe muscle cramps in legs, arms, or abdomen. These symptoms may start as a mild muscular discomfort. You should now stop all activity, get in the shade, and drink water. If you fail to recognize the early symptoms and continue your physical activity, you will have severe muscle cramps and pain.
302. What causes Heat Exhaustion? What are the symptoms? How is it treated?
1. A large loss of body water and salt causes heat exhaustion. Symptoms are headache, mental confusion, irritability, excessive sweating, weakness, dizziness, cramps, and pale, moist, cold (clammy) skin. Immediately get the patient under shade. Make him lie on a stretcher or similar item about 45 centimeters off the ground. Loosen his clothing. Sprinkle him with water and fan him. Have him drink small amounts of water every 3 minutes. Ensure he stays quiet and rests.
303. What are the causes of Heat Stroke? What are the symptoms of heat stroke? How is it treated?
1. A severe heat injury caused by extreme loss of water and salt and the body's inability to cool itself. The patient may die if not cooled immediately. Symptoms are the lack of sweat, hot and dry skin, headache, dizziness, fast pulse, nausea and vomiting, and mental confusion leading to unconsciousness. Immediately get the person to shade. Lay him on a stretcher or similar item about 45 centimeters off the ground. Loosen his clothing. Pour water on him (it does not matter if the water is polluted or brackish) and fan him. Massage his arms, legs, and body. If he regains consciousness, let him drink small amounts of water every 3 minutes.
304. Use a buddy system to watch for heat injury. What are good guidelines to follow when conducting operations in the desert?
1. • Make sure you tell someone where you are going and when you will return.
  2. • Watch for signs of heat injury. If someone complains of tiredness or wanders away from the group, he may be a heat casualty.
  3. • Drink water at least once an hour.
  4. • Get in the shade when resting; do not lie directly on the ground.
  5. • Do not take off your shirt and work during the day.

6. • Check the color of your urine. A light color means you are drinking enough water, a dark color means you need to drink more.
305. There are several hazards unique to desert survival. What are they?
  1. These include insects, snakes, thorned plants and cacti, contaminated water, sunburn, eye irritation, and climatic stress.
306. Insects of almost every type abound in the desert. Man, as a source of water and food, attracts lice, mites, wasps, and flies. What does this mean?
  1. They are extremely unpleasant and may carry diseases. Old buildings, ruins, and caves are favorite habitats of spiders, scorpions, centipedes, lice, and mites. These areas provide protection from the elements and also attract other wild-life. Therefore, take extra care when staying in these areas. Wear gloves at all times in the desert.
307. High temperatures, heavy rainfall, and oppressive humidity characterize what regions of the world?
  1. equatorial and subtropical regions, except at high altitudes. At low altitudes, temperature variation is seldom less than 10 degrees C and is often more than 35 degrees C. At altitudes over 1,500 meters, ice often forms at night. The rain has a cooling effect, but when it stops, the temperature soars. Rainfall is heavy, often with thunder and lightning. Sudden rain beats on the tree canopy, turning trickles into raging torrents and causing rivers to rise. Just as suddenly, the rain stops. Violent storms may occur, usually toward the end of the summer months. Hurricanes, cyclones, and typhoons develop over the sea and rush inland, causing tidal waves and devastation ashore.
308. In choosing campsites, make sure you are above any potential flooding. What are other considerations to make when choosing a campsite?
  1. Prevailing winds vary between winter and summer. The dry season has rain once a day and the monsoon has continuous rain. In Southeast Asia, winds from the Indian Ocean bring the monsoon, but it is dry when the wind blows from the landmass of China.
  2. There is no standard jungle.
309. The tropical area may be any of the following:
  1. • Rain forests.
  2. • Secondary jungles.
  3. • Semievergreen seasonal and monsoon forests.
  4. • Scrub and thorn forests.
  5. • Savannas.
  6. • Saltwater swamps.
  7. • Freshwater swamps.
310. The climate varies little in rain forests. What does this mean?
  1. You find these forests across the equator in the Amazon and Congo basins, parts of Indonesia, and several Pacific islands. Up to 3.5 meters of rain fall evenly throughout the year. Temperatures range from about 32 degrees C in the day to 21 degrees C at night.
311. There are five layers of what in rain forests?

1. vegetation in this jungle
312. Where untouched by man, jungle trees rise from buttress roots to heights of 60 meters. What are characteristics of the forests underneath them?
  1. Below them, smaller trees produce a canopy so thick that little light reaches the jungle floor. Seedlings struggle beneath them to reach light, and masses of vines and lianas twine up to the sun. Ferns, mosses, and herbaceous plants push through a thick carpet of leaves, and a great variety of fungi grow on leaves and fallen tree trunks.
313. Because of the lack of light on the jungle floor, there is little undergrowth to hamper movement. What is a downside of being on the jungle floor?
  1. but dense growth limits visibility to about 50 meters. You can easily lose your sense of direction in this jungle, and it is extremely hard for aircraft to see you.
314. What are secondary jungles?
  1. Very similar to rain forest. Prolific growth, where sunlight penetrates to the jungle floor, typifies this type of forest. Such growth happens mainly along river banks, on jungle fringes, and where man has cleared rain forest. When abandoned, tangled masses of vegetation quickly reclaim these cultivated areas. You can often find cultivated food plants among this vegetation.
315. The characteristics of the American and African semievergreen seasonal forests correspond with those of the Asian monsoon forests. These characteristics are?
  1. • Their trees fall into two stories of tree strata. Those in the upper story average 18 to 24 meters; Those in the lower story average 7 to 13 meters.
  2. • The diameter of the trees averages 0.5 meter.
  3. • Their leaves fall during a seasonal drought.
  4. Except for the sago, nipa, and coconut palms, the same edible plants grow in these areas as in the tropical rain forests.
316. You find semievergreen forests in portions of what countries?
  1. Columbia and Venezuela and the Amazon basin in South America; in portions of southeast coastal Kenya, Tanzania, and Mozambique in Africa; in Northeastern India, much of Burma, Thailand, Indochina, Java, and parts of other Indonesian islands in Asia.
317. The chief characteristics of tropical scrub and thorn forests are what?
  1. • There is a definite dry season.
  2. • Trees are leafless during the dry season.
  3. • The ground is bare except for a few tufted plants in bunches; grasses are uncommon.
  4. • Plants with thorns predominate.
  5. • Fires occur frequently.
318. You find tropical scrub and thorn forests:
  1. west coast of Mexico, Yucatan peninsula, Venezuela, Brazil; on the northwest coast and central parts of Africa; and in Asia, in Turkestan and India.
319. What is hard to do within the tropical scrub and thorn forest areas?
  1. obtain food plants during the dry season. During the rainy season, plants are considerably more abundant.

320. General characteristics of the savanna are--
1. • It is found within the tropical zones in South America and Africa.
  2. • It looks like a broad, grassy meadow, with trees spaced at wide intervals.
  3. • It frequently has red soil.
  4. • It grows scattered trees that usually appear stunted and gnarled like apple trees. Palms also
  5. occur on savannas.
321. What parts of the world can savannas be found?
1. Venezuela, Brazil, and the Guianas in South America. In Africa, you find them in the southern Sahara (north-central Cameroon and Gabon and southern Sudan), Benin, Togo, most of Nigeria, northeastern Zaire, northern Uganda, western Kenya, part of Malawi, part of Tanzania, southern Zimbabwe, Mozambique, and western Madagascar.
322. Visibility in saltwater swamps are:
1. poor, and movement is extremely difficult.
323. Sometimes, streams that you can raft form channels,
1. but you usually must travel on foot through this swamp.
324. Saltwater swamps are common where?
1. West Africa, Madagascar, Malaysia, the Pacific islands, Central and South America, and at the mouth of the Ganges River in India. The swamps at the mouths of the Orinoco and Amazon rivers and rivers of Guyana consist of mud and trees that offer little shade. Tides in saltwater swamps can vary as much as 12 meters. coastal areas subject to tidal flooding. Mangrove trees thrive in these swamps. Mangrove trees can reach heights of 12 meters, and their tangled roots are an obstacle to movement.
325. Everything in a saltwater swamp may appear hostile to you. What are tips for navigating through these areas?
1. from leeches and insects to crocodiles and caimans. Avoid the dangerous animals in this swamp. With practice, movement through thick undergrowth and jungle can be done efficiently. Always wear long sleeves to avoid cuts and scratches.
326. To move easily, you must develop "jungle eye," What is jungle eye?
1. that is, you should not concentrate on the pattern of bushes and trees to your immediate front. You must focus on the jungle further out and find natural breaks in the foliage. Look through the jungle, not at it. Stop and stoop down occasionally to look along the jungle floor. This action may reveal game trails that you can follow. Stay alert and move slowly and steadily through dense forest or jungle.
  2. Stop periodically to listen and take your bearings. Use a machete to cut through dense vegetation, but do not cut unnecessarily or you will quickly wear yourself out. If using a machete, stroke upward when cutting vines to reduce noise because sound carries long distances in the jungle. Use a stick to part the vegetation. Using a stick will also help dislodge biting ants, spiders, or snakes.

Do not grasp at brush or vines when climbing slopes; they may have irritating spines or sharp thorns.

327. Many jungle and forest animals follow game trails. Can you use this to your advantage?
1. These trails wind and cross, but frequently lead to water or clearings. Use these trails if they lead in your desired direction of travel.
328. In many countries, electric and telephone lines run for miles through sparsely inhabited areas. How can they be utilized in a survival situation?
1. Usually, the right-of-way is clear enough to allow easy travel. When traveling along these lines, be careful as you approach transformer and relay stations. In enemy territory, they may be guarded.
329. There is less likelihood of your rescue from beneath a dense jungle canopy than in other survival situations. What does this mean?
1. You will probably have to travel to reach safety.
330. If you are the victim of an aircraft crash, the most important items to take with you from the crash site are?
1. a machete, a compass, a first aid kit, and a parachute or other material for use as mosquito netting and shelter.
331. Why is it important to take shelter from tropical rain, sun, and insects?
1. Malaria-carrying mosquitoes and other insects are immediate dangers, so protect yourself against bites.
332. In the tropics, even the smallest scratch can quickly become dangerously infected. What does this mean for survival in a jungle environment?
1. Promptly treat any wound, no matter how minor.
333. Can you use animals to find a water source?
1. Most animals require water regularly. Grazing animals such as deer, are usually never far from water and usually drink at dawn and dusk. Converging game trails often lead to water. Carnivores (meat eaters) are not reliable indicators of water. They get moisture from the animals they eat and can go without water for long periods. Birds can sometimes also lead you to water. Grain eaters, such as finches and pigeons, are never far from water. They drink at dawn and dusk. When they fly straight and low, they are heading for water. When returning from water, they are full and will fly from tree to tree, resting frequently. Do not rely on water birds to lead you to water. They fly long distances without stopping. Hawks, eagles, and other birds of prey get liquids from their victims; you cannot use them as a water indicator.
334. Can vines be a safe source of water?
1. Vines with rough bark and shoots about 5 centimeters thick can be a useful source of water. You must learn by experience which are the water-bearing vines, because not all have drinkable water. Some may even have a poisonous sap. The poisonous ones yield a sticky, milky sap when cut. Nonpoisonous vines will give a clear fluid. Some vines cause a skin irritation on contact; therefore let the liquid drip into your mouth, rather than put your mouth to the vine. Preferably, use

some type of container. Use the procedure described in Chapter 6 to obtain water from a vine.

335. In Australia, the water tree, desert oak, and bloodwood have roots near the surface. How can you obtain water from these trees?
1. Pry these roots out of the ground and cut them into 30-centimeter lengths. Remove the bark and suck out the moisture, or shave the root to a pulp and squeeze it over your mouth.
336. The buri, coconut, and nipa palms all contain a sugary fluid that is very good to drink. How can you obtain the liquid?
1. Bend a flowering stalk of one of these palms downward, and cut off its tip. If you cut a thin slice off the stalk every 12 hours, the flow will renew, making it possible to collect up to a liter per day.
  2. Nipa palm shoots grow from the base, so that you can work at ground level. On grown trees of other species, you may have to climb them to reach a flowering stalk. Milk from coconuts has a large water content, but may contain a strong laxative in ripe nuts.
337. Often it requires too much effort to dig for roots containing water. How else can plants produce water for you?
1. It may be easier to let a plant produce water for you in the form of condensation. Tying a clear plastic bag around a green leafy branch will cause water in the leaves to evaporate and condense in the bag. Placing cut vegetation in a plastic bag will also produce condensation. This is a solar still
338. What are examples of Food Plants from jungle plants?
1. • Bael fruit (*Aegle marmelos*)
  2. • Bamboo (various species)
  3. • Banana or plantain (*Musa* species)
  4. • Bignay (*Antidesma bunius*)
  5. • Breadfruit (*Artocarpus incisa*)
  6. • Coconut palm (*Cocos nucifera*)
  7. • Fishtail palm (*Caryota urens*)
  8. • Horseradish tree (*Moringa pterygosperma*)
  9. • Lotus (*Nelumbo* species)
  10. • Mango (*Mangifera indica*)
  11. • Manioc (*Manihot utilissima*)
  12. • Nipa palm (*Nipa fruticans*)
  13. • Papaya (*Carica papaya*)
  14. • Persimmon (*Diospyros virginiana*)
  15. • Rattan palm (*Calamus* species)
  16. • Sago palm (*Metroxylon sagu*)
  17. • Sterculia (*Sterculia foetida*)
  18. • Sugarcane (*Saccharum officinarum*)
  19. • Sugar palm (*Arenga pinnata*)
  20. • Sweetsop (*Annona squamosa*)
  21. • Taro (*Colocasia* and *Alocasia* species)

- 22. • Water lily (*Nymphaea odorata*)
  - 23. • Wild fig (*Ficus* species)
  - 24. • Wild rice (*Zizania aquatica*)
  - 25. • Yam (*Dioscorea* species)
339. What are considered cold weather regions?
- 1. arctic and subarctic areas and areas immediately adjoining them.
340. You can classify about 48 percent of the northern hemisphere's total landmass as a cold region due to what factors?
- 1. Influence and extent of air temperatures. Ocean currents affect cold weather and cause large areas normally included in the temperate zone to fall within the cold regions during winter periods. Elevation also has a marked effect on defining cold regions.
341. Within the cold weather regions, you may face two types of cold weather environments. What are they?
- 1. Wet or dry. Knowing in which environment your area of operations falls will affect planning and execution of a cold weather operation.
342. What are considered Wet Cold Weather Environments?
- 1. Wet cold weather conditions exist when the average temperature in a 24-hour period is -10 degrees C or above. Characteristics of this condition are freezing during the colder night hours and thawing during the day. Even though the temperatures are warmer during this condition, the terrain is usually very sloppy due to slush and mud. You must concentrate on protecting yourself from the wet ground and from freezing rain or wet snow.
343. What are considered Dry Cold Weather Environments?
- 1. Dry cold weather conditions exist when the average temperature in a 24-hour period remains below -10 degrees C. Even though the temperatures in this condition are much lower than normal, you do not have to contend with the freezing and thawing. In these conditions, you need more layers of inner clothing to protect you from temperatures as low as -60 degrees C. Extremely hazardous conditions exist when wind and low temperature combine.
344. How does windchill affect your survival in cold environments?
- 1. Windchill increases the hazards in cold regions. Windchill is the effect of moving air on exposed flesh. For instance, with a 27.8-kph (15-knot) wind and a temperature of -10 degrees C, the equivalent windchill temperature is -23 degrees C. Figure 15-1 gives the windchill factors for various temperatures and wind speeds.
345. It is more difficult for you to satisfy your basic water, food, and shelter needs in a cold environment than in a warm environment. Why is this?
- 1. Even if you have the basic requirements, you must also have adequate protective clothing and the will to survive. The will to survive is as important as the basic needs. There have been incidents when trained and well-equipped individuals have not survived cold weather situations because they lacked the will to live. Conversely, this will has sustained individuals less well- trained and equipped.

2. You must not only have enough clothing to protect you from the cold, you must also know how to maximize the warmth you get from it. For example, always keep your head covered. You can lose 40 to 45 percent of body heat from an unprotected head and even more from the unprotected neck, wrist, and ankles. These areas of the body are good radiators of heat and have very little insulating fat
346. The brain is very susceptible to cold and can stand the least amount of cooling. How does this impact your survival in cold weather?
1. Because there is much blood circulation in the head, most of which is on the surface, you can lose heat quickly if you do not cover your head.
347. There are four basic principles to follow to keep warm. An easy way to remember these basic principles is to use the word COLD--
1. C - Keep clothing clean.
  2. O - Avoid overheating.
  3. L - Wear clothes loose and in layers.
  4. D - Keep clothing dry.
348. C - Keep clothing clean. What does this principle entail?
1. This principle is always important for sanitation and comfort. In winter, it is also important from the standpoint of warmth. Clothes matted with dirt and grease lose much of their insulation value. Heat can escape more easily from the body through the clothing's crushed or filled up air pockets.
349. O - Avoid overheating. What does this principle entail?
1. When you get too hot, you sweat and your clothing absorbs the moisture. This affects your warmth in two ways: dampness decreases the insulation quality of clothing, and as sweat evaporates, your body cools. Adjust your clothing so that you do not sweat. Do this by partially opening your parka or jacket, by removing an inner layer of clothing, by removing heavy outer mittens, or by throwing back your parka hood or changing to lighter headgear. The head and hands act as efficient heat dissipaters when overheated.
350. L - Wear your clothing loose and in layers. What does this principle entail?
1. Wearing tight clothing and footgear restricts blood circulation and invites cold injury. It also decreases the volume of air trapped between the layers, reducing its insulating value. Several layers of lightweight clothing are better than one equally thick layer of clothing, because the layers have dead-air space between them. The dead-air space provides extra insulation. Also, layers of clothing allow you to take off or add clothing layers to prevent excessive sweating or to increase warmth.
351. D - Keep clothing dry. What does this principle entail?
1. In cold temperatures, your inner layers of clothing can become wet from sweat and your outer layer, if not water repellent, can become wet from snow and frost melted by body heat. Wear water repellent outer clothing, if available. It will shed most of the water collected from melting snow and frost. Before entering a heated shelter, brush off the snow and frost.



352. Despite the precautions you take, there will be times when you cannot keep from getting wet. What should you do in such situations?
1. At such times, drying your clothing may become a major problem. On the march, hang your damp mittens and socks on your rucksack. Sometimes in freezing temperatures, the wind and sun will dry this clothing. You can also place damp socks or mittens, unfolded, near your body so that your body heat can dry them. In a campsite, hang damp clothing inside the shelter near the top, using drying lines or improvised racks. You may even be able to dry each item by holding it before an open fire.
353. A heavy, down-lined sleeping bag is a valuable piece of survival gear in cold weather. What are considerations you should make when using this equipment?
1. Ensure the down remains dry. If wet, it loses a lot of its insulation value. If you do not have a sleeping bag, you can make one out of parachute cloth or similar material and natural dry material, such as leaves, pine needles, or moss. Place the dry material between two layers of the material.
354. What are other important survival items in a cold weather environment?
1. knife; waterproof matches in a waterproof container, preferably one with a flint attached; a durable compass; map; watch; waterproof ground cloth and cover; flashlight; binoculars; dark glasses; fatty emergency foods; food gathering gear; and signaling items.
355. Remember, a cold weather environment can be very harsh. How does this impact the selection of your gear in a survival?
1. Give a good deal of thought to selecting the right equipment for survival in the cold. If unsure of an item you have never used, test it in an "overnight backyard" environment before venturing further. Once you have selected items that are essential for your survival, do not lose them after you enter a cold weather environment.
356. Should you clean yourself in an arctic environment?
1. Although washing yourself may be impractical and uncomfortable in a cold environment,
  2. you must do so. Washing helps prevent skin rashes that can develop into more serious problems.
357. In some situations, you may be able to take a snow bath. What is a snow bath?
1. Take a handful of snow and wash your body where sweat and moisture accumulate, such as under the arms and between the legs, and then wipe yourself dry. If possible, wash your feet daily and put on clean, dry socks. Change your underwear at least twice a week. If you are unable to wash your underwear, take it off, shake it, and let it air out for an hour or two.
358. If you are using a previously used shelter, check your body and clothing for lice each night. What should you do if you notice lice on your body?
1. If your clothing has become infested, use insecticide powder if you have any. Otherwise, hang your clothes in the cold, then beat and brush them. This will help get rid of the lice, but not the eggs. If you shave, try to do so before going to bed. This will give your skin a chance to recover before exposing it to the

elements. Your body has a control system that lets it react to temperature extremes to maintain a temperature balance.

359. There are three main factors that affect this temperature balance are:
1. heat production, heat loss, and evaporation. The difference between the body's core temperature and the environment's temperature governs the heat production rate. Your body can get rid of heat better than it can produce it. Sweating helps to control the heat balance. Maximum sweating will get rid of heat about as fast as maximum exertion produces it.
  2. Shivering causes the body to produce heat. It also causes fatigue that, in turn, leads to a drop in body temperature. Air movement around your body affects heat loss. It has been calculated that a naked man exposed to still air at or about 0 degrees C can maintain a heat balance if he shivers as hard as he can. However, he can't shiver forever. It has also been calculated that a man at rest wearing the maximum arctic clothing in a cold environment can keep his internal heat balance during temperatures well below freezing. To withstand really cold conditions for any length of time, however, he will have to become active or shiver.
360. The best way to deal with injuries and sicknesses is to:
1. prevent them from happening in the first place. Treat any injury or sickness that occurs as soon as possible to prevent it from worsening. The knowledge of signs and symptoms and the use of the buddy system are critical in maintaining health.
361. What is Hypothermia?
1. the lowering of the body temperature at a rate faster than the body can produce heat. Causes of hypothermia may be general exposure or the sudden wetting of the body by falling into a lake
  2. or spraying with fuel or other liquids.
362. What are some of the symptoms of hypothermia?
1. The initial symptom is shivering. This shivering may progress to the point that it is uncontrollable and interferes with an individual's ability to care for himself. This begins when the body's core (rectal) temperature falls to about 35.5 degrees C (96 degrees F). When the core temperature reaches 35 to 32 degrees C (95 to 90 degrees F), sluggish thinking, irrational reasoning, and a false feeling of warmth may occur. Core temperatures of 32 to 30 degrees C (90 to 86 degrees F) and below result in muscle rigidity, unconsciousness, and barely detectable signs of life. If the victim's core temperature falls below 25 degrees C (77 degrees F), death is almost certain.
363. How is hypothermia treated?
1. rewarm the entire body. If there are means available, rewarm the person by first immersing the trunk area only in warm water of 37.7 to 43.3 degrees C (100 to 110 degrees F).
364. One of the quickest ways to get heat to the inner core is:
1. to give warm water enemas. Such an action, however, may not be possible in a survival situation. Another method is to wrap the victim in a warmed sleeping bag with another person who is already warm; both should be naked. If the person is conscious, give him hot, sweetened fluids. One of the best sources of calories

is honey or dextrose; if unavailable, use sugar, cocoa, or a similar soluble sweetener.

365. There are two dangers in treating hypothermia. What are they?
1. rewarming too rapidly and "after drop." Rewarming too rapidly can cause the victim to have circulatory problems, resulting in heart failure. After drop is the sharp body core temperature drop that occurs when taking the victim from the warm water. Its probable cause is the return of previously stagnant limb blood to the core (inner torso) area as recirculation occurs. Concentrating on warming the core area and stimulating peripheral circulation will lessen the effects of after drop.
366. What is frostbite?
1. This injury is the result of frozen tissues.
367. What does light frostbite involve?
1. only the skin that takes on a dull whitish pallor. Deep 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.
368. The following pointers will aid you in keeping warm and preventing frostbite when it is extremely cold or when you have less than adequate clothing:
1. • Face. Maintain circulation by twitching and wrinkling the skin on your face making faces. Warm with your hands.
  2. • Ears. Wiggle and move your ears. Warm with your hands.
  3. • Hands. Move your hands inside your gloves. Warm by placing your hands close to your body.
  4. • Feet. Move your feet and wiggle your toes inside your boots.
369. A loss of feeling in your hands and feet is a sign of frostbite. What should you do if you suspect frostbite on your hands and feet?
1. If you have lost feeling for only a short time, the frostbite is probably light. Otherwise, assume the frostbite is deep. To rewarm a light frostbite, use your hands or mittens to warm your face and ears. Place your hands under your armpits. Place your feet next to your buddy's stomach. A deep frostbite injury, if thawed and refrozen, will cause more damage than a nonmedically trained person can handle.
370. What causes Trench Foot and Immersion Foot?
1. These conditions result from many hours or days of exposure to wet or damp conditions at a temperature just above freezing.
371. What are the symptoms of hypothermia?
1. The symptoms are a sensation of pins and needles, tingling, numbness, and then pain. The skin will initially appear wet, soggy, white, and shriveled. As it progresses and damage appears, the skin will take on a red and then a bluish or black discoloration. The feet become cold, swollen, and have a waxy appearance. Walking becomes difficult and the feet feel heavy and numb. 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.

372. Is dehydration an important issue when operating in an arctic environment?
1. When bundled up in many layers of clothing during cold weather, you may be unaware that you are losing body moisture.
373. What is the best way to prevent frostbite?
1. The best prevention is to keep your feet dry. Carry extra socks with you in a waterproof packet. You can dry wet socks against your torso (back or chest). Wash your feet and put on dry socks daily.
374. What is Cold Diuresis?
1. Exposure to cold increases urine output. It also decreases body fluids that you must replace. Your heavy clothing absorbs the moisture that evaporates in the air. You must drink water to replace this loss of fluid. Your need for water is as great in a cold environment as it is in a warm environment.
375. How can you tell if you are becoming hydrated?
1. One way to tell if you are becoming dehydrated is to check the color of your urine on snow. If your urine makes the snow dark yellow, you are becoming dehydrated and need to replace body fluids. If it makes the snow light yellow to no color, your body fluids have a more normal balance.
376. How does sunburn impact your survival in an arctic environment?
1. Exposed skin can become sunburned even when the air temperature is below freezing. The sun's rays reflect at all angles from snow, ice, and water, hitting sensitive areas of skin--lips, nostrils, and eyelids. Exposure to the sun results in sunburn more quickly at high altitudes than at low altitudes. Apply sunburn cream or lip salve to your face when in the sun.
377. The reflection of the sun's ultraviolet rays off a snow-covered area causes this condition. What are the symptoms of snow blindness?
1. grit in the eyes, pain in and over the eyes that increases with eyeball movement, red and teary eyes, and a headache that intensifies with continued exposure to light. Prolonged exposure to these rays can result in permanent eye damage. To treat snow blindness, bandage your eyes until the symptoms disappear.
378. How can you prevent snow blindness?
1. wearing sunglasses. If you don't have sunglasses, improvise. Cut slits in a piece of cardboard, thin wood, tree bark, or other available material (Figure 15-3). Putting soot under your eyes will help reduce shine and glare.
379. How does constipation impact your survival in an arctic environment?
1. It is very important to relieve yourself when needed. Do not delay because of the cold condition. Delaying relieving yourself because of the cold, eating dehydrated foods, drinking too little liquid, and irregular eating habits can cause you to become constipated. Although not disabling, constipation can cause some discomfort. Increase your fluid intake to at least 2 liters above your normal 2 to 3 liters daily intake and, if available, eat fruit and other foods that will loosen the stool.
380. How do insect bites impact your survival in an arctic environment?
1. Insect bites can become infected through constant scratching. Flies can carry various disease-producing germs. To prevent insect bites, use insect repellent,

netting, and wear proper clothing. See Chapter 11 for information on insect bites and Chapter 4 for treatment.

381. Your environment and the equipment you carry with you will determine the type of:
  1. shelter you can build. You can build shelters in wooded areas, open country, and barren areas. Wooded areas usually provide the best location, while barren areas have only snow as building material. Wooded areas provide timber for shelter construction, wood for fire, concealment from observation, and protection from the wind.
382. In extreme cold, do not use metal, such as an aircraft fuselage, for shelter. Why shouldn't you use metal?
  1. The metal will conduct away from the shelter what little heat you can generate.
383. Shelters made from ice or snow usually require tools like:
  1. Ice axes or saws. You must also expend much time and energy to build such a shelter. Be sure to ventilate an enclosed shelter, especially if you intend to build a fire in it.
384. Why should you try to block your shelter's entrance?
  1. To keep the heat in and the wind out. Use a rucksack or snow block. Construct a shelter no larger than needed. This will reduce the amount of space to heat. A fatal error in cold weather shelter construction is making the shelter so large that it steals body heat rather than saving it. Keep shelter space small.
385. What should you do instead of sleeping directly on the ground?
  1. the ground. Lay down some pine boughs, grass, or other insulating material to keep the ground from absorbing your body heat.
386. Never fall asleep without turning out your stove or lamp. Why is this?
  1. Carbon monoxide poisoning can result from a fire burning in an unventilated shelter. Carbon monoxide is a great danger. It is colorless and odorless. Any time you have an open flame, it may generate carbon monoxide. Always check your ventilation. Even in a ventilated shelter, incomplete combustion can cause carbon monoxide poisoning.
387. Usually, there are no symptoms of carbon monoxide poisoning. What can occur after carbon monoxide poisoning, however?
  1. Unconsciousness and death can occur without warning. Sometimes, however, pressure at the temples, burning of the eyes, headache, pounding pulse, drowsiness, or nausea may occur. The one characteristic, visible sign of carbon monoxide poisoning is a cherry red coloring in the tissues of the lips, mouth, and inside of the eyelids. Get into fresh air at once if you have any of these symptoms.
388. What is the snow cave shelter? How do you make it?
  1. The most effective shelter because of the insulating qualities of snow. Remember that it takes time and energy to build and that you will get wet while building it. First, you need to find a drift about 3 meters deep into which you can dig. While building this shelter, keep the roof arched for strength and to allow melted snow to drain down the sides.
389. What is a Snow Trench Shelter? How do you make it?

1. The idea behind this shelter (Figure 15-4) is to get you below the snow and wind level and use the snow's insulating qualities. If you are in an area of compacted snow, cut snow blocks and use them as overhead cover. If not, you can use a poncho or other material. Build only one entrance and use a snow block or rucksack as a door.
390. How can you make a Snow Block and Parachute Shelter?
  1. Use snow blocks for the sides and parachute material for overhead cover (Figure 15-4). If snowfall is heavy, you will have to clear snow from the top at regular intervals to prevent the collapse of the parachute material.
391. How can you use a Snow House or Igloo for shelter in an arctic environment?
  1. In certain areas, the natives frequently use this type of shelter (Figure 15-4) as hunting and fishing shelters. They are efficient shelters but require some practice to make them properly. Also, you must be in an area that is suitable for cutting snow blocks and have the equipment to cut them (snow saw or knife).
392. How can you use a Lean-To for shelter in an arctic environment?
  1. Construct this shelter in the same manner as for other environments; however, pile snow around the sides for insulation (Figure 15-5).
393. How can you use a Fallen Tree shelter in an arctic environment?
  1. To build this shelter, find a fallen tree and dig out the snow underneath it (Figure 15-6). The snow will not be deep under the tree. If you must remove branches from the inside, use them to line the floor.
394. How can you use a tree pit shelter in an arctic environment?
  1. Dig snow out from under a suitable large tree. It will not be as deep near the base of the tree. Use the cut branches to line the shelter. Use a ground sheet as overhead cover to prevent snow from falling off the tree into the shelter. If built properly, you can have 360-degree visibility (Figure 5-12, Chapter 5).
395. How can the military's 20-Man Life Raft be used in a survival situation?
  1. This raft is the standard overwater raft on U.S. Air Force aircraft. You can use it as a shelter. Do not let large amounts of snow build up on the overhead protection. If placed in an open area, it also serves as a good signal to overhead aircraft.
396. Fire is especially important in cold weather. Why?
  1. It not only provides a means to prepare food, but also to get warm and to melt snow or ice for water. It also provides you with a significant psychological boost by making you feel a little more secure in your situation.
397. What considerations should you make when starting fires in enemy territory?
  1. If you are in enemy territory, remember that the smoke, smell, and light from your fire may reveal your location. Light reflects from surrounding trees or rocks, making even indirect light a source of danger. Smoke tends to go straight up in cold, calm weather, making it a beacon during the day, but helping to conceal the smell at night. In warmer weather, especially in a wooded area, smoke tends to hug the ground, making it less visible in the day, but making its odor spread.
398. If you are in enemy territory, how should you collect firewood?

1. cut low tree boughs rather than the entire tree for firewood. Fallen trees are easily seen from the air.
399. All wood will burn, but some types of wood create more smoke than others. How do different types of wood create smoke?
1. For instance, coniferous trees that contain resin and tar create more and darker smoke than deciduous trees. There are few materials to use for fuel in the high mountainous regions of the arctic. You may find some grasses and moss, but very little. The lower the elevation, the more fuel available. You may find some scrub willow and small, stunted spruce trees above the tree line. On sea ice, fuels are seemingly nonexistent. Driftwood or fats may be the only fuels available to a survivor on the barren coastlines in the arctic and subarctic regions.
400. Abundant fuels within the tree line are--
1. • Spruce trees are common in the interior regions. As a conifer, spruce makes a lot of smoke when burned in the spring and summer months. However, it burns almost smoke-free in late fall and winter.
  2. • The tamarack tree is also a conifer. It is the only tree of the pine family that loses its needles in the fall. Without its needles, it looks like a dead spruce, but it has many knobby buds and cones on its bare branches. When burning, tamarack wood makes a lot of smoke and is excellent for signaling purposes.
  3. • Birch trees are deciduous and the wood burns hot and fast, as if soaked with oil or kerosene. Most birches grow near streams and lakes, but occasionally you will find a few on higher ground and away from water.
  4. • Willow and alder grow in arctic regions, normally in marsh areas or near lakes and streams. These woods burn hot and fast without much smoke.
401. Dried moss, grass, and scrub willow are other materials you can use for fuel. Where can these normally be found?
1. These are usually plentiful near streams in tundras (open, treeless plains). By bundling or twisting grasses or other scrub vegetation to form a large, solid mass, you will have a slower burning, more productive
402. If fuel or oil is available from a wrecked vehicle or downed aircraft, how should it be used?
1. use it for fuel. Leave the fuel in the tank for storage, drawing on the supply only as you need it. Oil congeals in extremely cold temperatures, therefore, drain it from the vehicle or aircraft while still warm if there is no danger of explosion or fire. If you have no container, let the oil drain onto the snow or ice. Scoop up the fuel as you need it.
403. In cold weather regions, there are some hazards in using fires, whether to keep warm or to cook. What are some examples?
1. • Fires have been known to burn underground, resurfacing nearby. Therefore, do not build a fire too close to a shelter.
  2. • In snow shelters, excessive heat will melt the insulating layer of snow that may also be your camouflage.
  3. • A fire inside a shelter lacking adequate ventilation can result in carbon monoxide poisoning.

4. • A person trying to get warm or to dry clothes may become careless and burn or scorch his clothing and equipment.
  5. • Melting overhead snow may get you wet, bury you and your equipment, and possibly extinguish your fire.
404. In general, what is best for cooking in a survival situation?
1. a small fire and some type of stove is the best combination for cooking purposes. A hobo stove (Figure 15-7) is particularly suitable to the arctic. It is easy to make out of a tin can, and it conserves fuel. A bed of hot coals provides the best cooking heat. Coals from a crisscross fire will settle uniformly. Make this type of fire by crisscrossing the firewood. A simple crane propped on a forked stick will hold a cooking container over a fire.
405. For heating purposes, a single candle provides enough heat to do what?
1. warm an enclosed shelter. A small fire about the size of a man's hand is ideal for use in enemy territory. It requires very little fuel, yet it generates considerable warmth and is hot enough to warm liquids.
406. Water sources in arctic and subarctic regions are more sanitary than in other regions due to what?
1. Climatic and environmental conditions. However, always purify the water before drinking it. During the summer months, the best natural sources of water are freshwater lakes, streams, ponds, rivers, and springs. Water from ponds or lakes may be slightly stagnant, but still usable. Running water in streams, rivers, and bubbling springs is usually fresh and suitable for drinking.
407. Is the brownish surface water found in a tundra during the summer a good source of water?
1. It is a good source of water. However, you may have to filter the water before purifying
408. What are considerations for melting freshwater ice and snow for water?
1. Completely melt both before putting them in your mouth. Trying to melt ice or snow in your mouth takes away body heat and may cause internal cold injuries. If on or near pack ice in the sea, you can use old sea ice to melt for water. In time, sea ice loses its salinity. You can identify this ice by its rounded corners and bluish color. You can use body heat to melt snow. Place the snow in a water bag and place the bag between your layers of clothing. This is a slow process, but you can use it on the move or when you have no fire.
409. What are advantages of using ice as a source of water compared to snow? What are some methods you can use to melt ice? How can you prevent it from refreezing once it has been melted?
1. When ice is available, melt it, rather than snow. One cup of ice yields more water than one cup of snow. Ice also takes less time to melt. You can melt ice or snow in a water bag, MRE ration bag, tin can, or improvised container by placing the container near a fire. Begin with a small amount of ice or snow in the container and, as it turns to water, add more ice or snow. Another way to melt ice or snow is by putting it in a bag made from porous material and suspending the bag near the fire. Place a container under the bag to catch the water. During cold weather,



avoid drinking a lot of liquid before going to bed. Crawling out of a warm sleeping bag at night to relieve yourself means less rest and more exposure to the cold. Once you have water, keep it next to you to prevent refreezing. Also, do not fill your canteen completely. Allowing the water to slosh around will help keep it from freezing.

410. During the summer months, you can easily get fish and other water life from coastal waters, streams, rivers, and lakes. What are some examples of these food sources?
1. The North Atlantic and North Pacific coastal waters are rich in seafood. You can easily find crawfish, snails, clams, oysters, and king crab. In areas where there is a great difference between the high and low tide water levels, you can easily find shellfish at low tide. Dig in the sand on the tidal flats. Look in tidal pools and on offshore reefs. In areas where there is a small difference between the high- and low-tide water levels, storm waves often wash shellfish onto the beaches. The eggs of the spiny sea urchin that lives in the waters around the Aleutian Islands and southern Alaska are excellent food. Look for the sea urchins in tidal pools. Break the shell by placing it between two stones. The eggs are bright yellow in color. Most northern fish and fish eggs are edible. Exceptions are the meat of the arctic shark and the eggs of the sculpins. The bivalves, such as clams and mussels, are usually more palatable than spiral-shelled seafood, such as snails. The sea cucumber is another edible sea animal. Inside its body are five long white muscles that taste much like clam meat. In early summer, smelt spawn in the beach surf. Sometimes you can scoop them up with your hands. You can often find herring eggs on the seaweed in midsummer. Kelp, the long ribbonlike seaweed, and other smaller seaweed that grow among offshore rocks are also edible.
411. You find polar bears in practically all arctic coastal regions, but rarely inland. How should you react to polar bears in the wild?
1. Avoid them if possible. They are the most dangerous of all bears. They are tireless, clever hunters with good sight and an extraordinary sense of smell. If you must kill one for food, approach it cautiously. Aim for the brain; a bullet elsewhere will rarely kill one. Always cook polar bear meat before eating it.
412. Earless seal meat is some of the best meat available. You need considerable skill, however, to get close enough to an earless seal to kill it. In spring, seals often bask on the ice beside their breathing holes. How do you approach a seal?
1. They raise their heads about every 30 seconds, however, to look for their enemy, the polar bear. To approach a seal, do as the Eskimos do--stay downwind from it, cautiously moving closer while it sleeps. If it moves, stop and imitate its movements by lying flat on the ice, raising your head up and down, and wriggling your body slightly. Approach the seal with your body side-ways to it and your arms close to your body so that you look as much like another seal as possible. The ice at the edge of the breathing hole is usually smooth and at an incline, so the least movement of the seal may cause it to slide into the water. Therefore, try to get within 22 to 45 meters of the seal and kill it instantly (aim for the brain). Try

to reach the seal before it slips into the water. In winter, a dead seal will usually float, but it is difficult to retrieve from the water.

413. Keep the seal blubber and skin from coming into contact with any scratch or broken skin you may have. Why is this?
1. You could get "spekk-finger," that is, a reaction that causes the hands to become badly swollen. Keep in mind that where there are seals, there are usually polar bears, and polar bears have stalked and killed seal hunters.
414. You can find porcupines in some arctic areas. How can they be found?
1. Porcupines feed on bark; if you find tree limbs stripped bare, you are likely to find porcupines in the area.
415. Ptarmigans, owls, Canadian jays, grouse, and ravens are the only birds that remain in the arctic during the winter. Where can they be found?
1. They are scarce north of the tree line. Ptarmigans and owls are as good for food as any game bird. Ravens are too thin to be worth the effort it takes to catch them. Ptarmigans, which change color to blend with their surroundings, are hard to spot. Rock ptarmigans travel in pairs and you can easily approach them.
416. What plants in the arctic provide sources of food?
1. • Arctic raspberry and blueberry
  2. • Arctic willow
  3. • Bearberry
  4. • Cranberry
  5. • Crowberry
  6. • Dandelion
  7. • Eskimo potato
  8. • Fireweed
  9. • Iceland moss
  10. • Marsh marigold
  11. • Reindeer moss
  12. • Rock tripe
  13. • Spatterdock
417. As a survivor or an evader in an arctic or subarctic region, you will face many obstacles. Your location and the time of the year will determine the types of obstacles and the inherent dangers. You should--
1. • Avoid traveling during a blizzard.
  2. • Take care when crossing thin ice. Distribute your weight by lying flat and crawling.
  3. • Cross streams when the water level is lowest. Normal freezing and thawing action may cause a stream level to vary as much as 2 to 2.5 meters per day. This variance may occur any time during the day, depending on the distance from a glacier, the temperature, and the terrain. Consider this variation in water level when selecting a campsite near a stream.
  4. • Consider the clear arctic air. It makes estimating distance difficult. You more frequently
  5. underestimate than overestimate distances.

6. • Do not travel in "whiteout" conditions. The lack of contrasting colors makes it impossible to judge the nature of the terrain.
  7. • Always cross a snow bridge at right angles to the obstacle it crosses. Find the strongest part of the bridge by poking ahead of you with a pole or ice axe. Distribute your weight by crawling or by wearing snowshoes or skis.
  8. • Make camp early so that you have plenty of time to build a shelter.
  9. • Consider frozen or unfrozen rivers as avenues of travel. However, some rivers that appear frozen may have soft, open areas that make travel very difficult or may not allow walking, skiing, or sledding.
  10. • Use snowshoes if you are traveling over snow-covered terrain. Snow 30 or more centimeters deep makes traveling difficult. If you do not have snowshoes, make a pair using willow, strips of cloth, leather, or other suitable material.
418. How can you determine wind direction? How can you use wind to increase situational awareness?
1. You can determine wind direction by dropping a few leaves or grass or by watching the treetops. Once you determine the wind direction, you can predict the type of weather that is imminent. Rapidly shifting winds indicate an unsettled atmosphere and a likely change in the weather.
419. How can smoke help determine the weather?
1. Smoke rising in a thin vertical column indicates fair weather. Low rising or "flattened out" smoke indicates stormy weather.
420. How do birds and insects help determine weather patterns?
1. Birds and insects fly lower to the ground than normal in heavy, moisture-laden air. Such flight indicates that rain is likely. Most insect activity increases before a storm, but bee activity increases before fair weather.
421. What do Low-Pressure Fronts tell you about the weather?
1. Slow-moving or imperceptible winds and heavy, humid air often indicate a low-pressure front. Such a front promises bad weather that will probably linger for several days. You can "smell" and "hear" this front. The sluggish, humid air makes wilderness odors more pronounced than during high-pressure conditions. In addition, sounds are sharper and carry farther in low-pressure than high-pressure conditions.
422. As a survivor on the open sea, you will face waves and wind. You may also face extreme heat or cold. To keep these environmental hazards from becoming serious problems, take precautionary measures as soon as possible. What are some of these precautionary measures?
1. Use the available resources to protect yourself from the elements and from heat or extreme cold and humidity. Protecting yourself from the elements meets only one of your basic needs. You must also be able to obtain water and food. Satisfying these three basic needs will help prevent serious physical and psychological problems. However, you must know how to treat health problems that may result from your situation.
423. Your survival at sea depends upon what factors?
1. • Your knowledge of and ability to use the available survival equipment.

2. • Your special skills and ability to apply them to cope with the hazards you face.
  3. • Your will to live.
424. If you are in an aircraft that goes down at sea, take the following actions once you clear the aircraft:
1. • Get clear and upwind of the aircraft as soon as possible, but stay in the vicinity until the aircraft sinks.
  2. • Get clear of fuel-covered water in case the fuel ignites.
  3. • Try to find other survivors.
425. A search for survivors usually takes place around:
1. the entire area of and near the crash site. Missing personnel may be unconscious and floating low in the water. Figure 16-1 illustrates rescue procedures.
426. The best technique for rescuing personnel from the water is:
1. to throw them a life preserver attached to a line. Another is to send a swimmer (rescuer) from the raft with a line attached to a flotation device that will support the rescuer's weight. This device will help conserve a rescuer's energy while recovering the survivor. The least acceptable technique is to send an attached swimmer without flotation devices to retrieve a survivor. In all cases, the rescuer wears a life preserver. A rescuer should not underestimate the strength of a panic-stricken person in the water.
427. The following are the best swimming strokes during a survival situation:
1. • Dog paddle. This stroke is excellent when clothed or wearing a life jacket. Although slow in speed, it requires very little energy.
  2. • Breaststroke. Use this stroke to swim underwater, through oil or debris, or in rough seas. It is probably the best stroke for long-range swimming: it allows you to conserve your energy and maintain a reasonable speed.
  3. • Sidestroke. It is a good relief stroke because you use only one arm to maintain momentum and buoyancy.
  4. • Backstroke. This stroke is also an excellent relief stroke. It relieves the muscles that you use for other strokes. Use it if an underwater explosion is likely.
428. If you are in an area where surface oil is burning--
1. • Discard your shoes and buoyant life preserver.
  2. Note: If you have an uninflated life preserver, keep it.
  3. • Cover your nose, mouth, and eyes and quickly go underwater.
  4. • Swim underwater as far as possible before surfacing to breathe.
  5. • Before surfacing to breathe and while still underwater, use your hands to push burning fluid away from the area where you wish to surface. Once an area is clear of burning liquid, you can surface and take a few breaths. Try to face downwind before inhaling.
  6. • Submerge feet first and continue as above until clear of the flames.
429. If you are in oil-covered water that is free of fire, what should you do?
1. hold your head high to keep the oil out of your eyes.
  2. Attach your life preserver to your wrist and then use it as a raft.

3. If you have a life preserver, you can stay afloat for an indefinite period. In this case, use the "HELP" body position: Heat Escaping Lessening Posture (HELP). Remain still and assume the fetal position to help you retain body heat. You lose about 50 percent of your body heat through your head. Therefore, keep your head out of the water. Other areas of high heat loss are the neck, the sides, and the groin. Figure 16-3 illustrates the HELP position.
430. If you are in a raft--
1. • Check the physical condition of all on board. Give first aid if necessary. Take seasickness pills if available. The best way to take these pills is to place them under the tongue and let them dissolve. There are also suppositories or injections against seasickness. Vomiting, whether from seasickness or other causes, increases the danger of dehydration.
  2. • Try to salvage all floating equipment--rations; canteens, thermos jugs, and other containers; clothing; seat cushions; parachutes; and anything else that will be useful to you. Secure the salvaged items in or to your raft. Make sure the items have no sharp edges that can puncture the raft.
  3. • If there are other rafts, lash the rafts together so they are about 7.5 meters apart. Be ready to draw them closer together if you see or hear an aircraft. It is easier for an aircrew to spot rafts that are close together rather than scattered.
  4. • Remember, rescue at sea is a cooperative effort. Use all available visual or electronic signaling devices to signal and make contact with rescuers. For example, raise a flag or reflecting material on an oar as high as possible to attract attention.
  5. • Locate the emergency radio and get it into operation. Operating instructions are on it. Use the emergency transceiver only when friendly aircraft are likely to be in the area.
  6. • Have other signaling devices ready for instant use. If you are in enemy territory, avoid using a signaling device that will alert the enemy. However, if your situation is desperate, you may have to signal the enemy for rescue if you are to survive.
431. Throw out the sea anchor, or improvise a drag from the raft's case, bailing bucket, or a roll of clothing. Are seas anchors important for your survival?
1. A sea anchor helps you stay close to your ditching site, making it easier for searchers to find you if you have relayed your location. Without a sea anchor, your raft may drift over 160 kilometers in a day, making it much harder to find you. You can adjust the sea anchor to act as a drag to slow down the rate of travel with the current, or as a means to travel with the current. You make this adjustment by opening or closing the sea anchor's apex. When open, the sea anchor (Figure 16-5) acts as a drag that keeps you in the general area. Additionally, adjust the sea anchor so that when the raft is on the wave's crest, the sea anchor is in the wave's trough.
432. What are some other considerations to make when using a raft in a survival situation?
1. • Wrap the sea anchor rope with cloth to prevent its chafing the raft. The anchor also helps to keep the raft headed into the wind and waves.

2. • In stormy water, rig the spray and windshield at once. In a 20-man raft, keep the canopy erected at all times. Keep your raft as dry as possible. Keep it properly balanced. All personnel should stay seated, the heaviest one in the center.
  3. • Calmly consider all aspects of your situation and determine what you and your companions must do to survive. Inventory all equipment, food, and water. Waterproof items that salt water may affect. These include compasses, watches, sextant, matches, and lighters. Ration food and water.
  4. • Assign a duty position to each person: for example, water collector, food collector, lookout, radio operator, signaler, and water bailers.
433. If you are in a cold climate--
1. • Put on an antiexposure suit. If unavailable, put on any extra clothing available. Keep clothes loose and comfortable.
  2. • Take care not to snag the raft with shoes or sharp objects. Keep the repair kit where you can readily reach it.
  3. • Rig a windbreak, spray shield, and canopy.
  4. • Try to keep the floor of the raft dry. Cover it with canvas or cloth for insulation.
  5. • Huddle with others to keep warm, moving enough to keep the blood circulating. Spread an extra tarpaulin, sail, or parachute over the group.
  6. • Give extra rations, if available, to men suffering from exposure to cold.
434. The greatest problem you face when submerged in cold water is:
1. hypothermia. When you are immersed in cold water, hypothermia occurs rapidly due to the decreased insulating quality of wet clothing and the result of water displacing the layer of still air that normally surrounds the body. The rate of heat exchange in water is about 25 times greater than it is in air of the same temperature.
435. If you are in a hot climate--
1. • Rig a sunshade or canopy. Leave enough space for ventilation.
  2. • Cover your skin, where possible, to protect it from sunburn. Use sunburn cream, if available, on all exposed skin. Your eyelids, the back of your ears, and the skin under your chin sunburn easily.
436. How can One-Man Rafts help you in a water survival situation?
1. The one-man raft has a main cell inflation. If the CO<sub>2</sub> bottle should malfunction or if the raft develops a leak, you can inflate it by mouth. The spray shield acts as a shelter from the cold, wind, and water. In some cases, this shield serves as insulation. The raft's insulated bottom limits the conduction of cold thereby protecting you from hypothermia (Figure 16-8).
437. You can travel more effectively by:
1. inflating or deflating the raft to take advantage of the wind or current. You can use the spray shield as a sail while the ballast buckets serve to increase drag in the water. You may use the sea anchor to control the raft's speed and direction. There are rafts developed for use in tactical areas that are black. These rafts blend with the sea's background. You can further modify these rafts for evasion by partially deflating them to obtain a lower profile.
438. If you have an arm injury, the best way to board is:

1. by turning your back to the small end of the raft, pushing the raft under your buttocks, and lying back. Another way to board the raft is to push down on its small end until one knee is inside and lie forward (Figure 16-10). If not, board in the following manner:
  2. • Approach the lower boarding ramp.
  3. • Remove your life preserver and tether it to yourself so that it trails behind you.
  4. • Grasp the boarding handles and kick your legs to get your body into a prone position on the water's surface; then kick and pull until you are inside the raft.
439. Rafts do not have keels, therefore, you can't sail them into the wind. Can you rafts to sail when necessary?
1. However, anyone can sail a raft downwind. You can successfully sail multiplace (except 20- to 25-man) rafts 10 degrees off from the direction of the wind. Do not try to sail the raft unless land is near. If you decide to sail and the wind is blowing toward a desired destination, fully inflate the raft, sit high, take in the sea anchor, rig a sail, and use an oar as a rudder.
440. How can you create a square sail for a raft?
1. In a multiplace (except 20- to 25-man) raft, erect a square sail in the bow using the oars and their extensions as the mast and crossbar. You may use a waterproof tarpaulin or parachute material for the sail. If the raft has no regular mast socket and step, erect the mast by tying it securely to the front cross seat using braces. Pad the bottom of the mast to prevent it from chafing or punching a hole through the floor, whether or not there is a socket. The heel of a shoe, with the toe wedged under the seat, makes a good improvised mast step. Do not secure the corners of the lower edge of the sail. Hold the lines attached to the corners with your hands so that a gust of wind will not rip the sail, break the mast, or capsize the boat. Water is your most important need. With it alone, you can live for ten days or longer, depending on your will to live. When drinking water, moisten your lips, tongue, and throat before swallowing.
441. What should you do when you do not have easy access to water?
1. When you have a limited water supply and you can't replace it by chemical or mechanical means, use shaded, both from overhead sun and from reflection off the sea surface. Allow ventilation of air; dampen your clothes during the hottest part of the day. Do not exert yourself. Relax and sleep when possible. Fix your daily water ration after considering the amount of water you have, the output of solar stills and desalting kit, and the number and physical condition of your party.
442. If you don't have water, don't eat. Why is this?
1. If your water ration is two liters or more per day, eat any part of your ration or any additional food that you may catch, such as birds, fish, shrimp. The life raft's motion and anxiety may cause nausea. If you eat when nauseated, you may lose your food immediately. If nauseated, rest and relax as much as you can, and take only water.
443. How should Solar Stills be used in a water survival situation?
1. When solar stills are available, read the instructions and set them up immediately. Use as many stills as possible, depending on the number of men in

the raft and the amount of sunlight available. Secure solar stills to the raft with care. This type of solar still only works on flat, calm seas.

444. How should Desalting Kits be used?
1. When desalting kits are available in addition to solar stills, use them only for immediate water needs or during long overcast periods when you cannot use solar stills. In any event, keep desalting kits and emergency water stores for periods when you cannot use solar stills or catch rainwater.
445. Can water be procured from fish?
1. Yes. Drink the aqueous fluid found along the spine and in the eyes of large fish. Carefully cut the fish in half to get the fluid along the spine and suck the eye. If you are so short of water that you need to do this, then do not drink any of the other body fluids. These other fluids are rich in protein and fat and will use up more of your reserve water in digestion than they supply.
446. Can Sea Ice be used to procure water?
1. In arctic waters, use old sea ice for water. This ice is bluish, has rounded comers, and splinters easily. It is nearly free of salt. New ice is gray, milky, hard, and salty. Water from icebergs is fresh, but icebergs are dangerous to approach. Use them as a source of water only in emergencies.
447. What are some other things you should not drink in a survival situation?
1. Do not drink seawater.
  2. Do not drink urine.
  3. Do not drink alcohol.
  4. Do not smoke.
  5. Do not eat, unless water is available.
448. What are the best ways to endure periods of reduced water and food intake?
1. Sleep and rest. However, make sure that you have enough shade when napping during the day. If the sea is rough, tie yourself to the raft, close any cover, and ride out the storm as best you can. Relax is the key word--at least try to relax.
449. Is Food Procurement an issue when stranded at sea?
1. In the open sea, fish will be the main food source. There are some poisonous and dangerous ocean fish, but, in general, when out of sight of land, fish are safe to eat. Nearer the shore there are fish that are both dangerous and poisonous to eat. There are some fish, such as the red snapper and barracuda, that are normally edible but poisonous when taken from the waters of atolls and reefs. Flying fish will even jump into your raft!
450. When fishing, do not handle the fishing line with bare hands and never wrap it around your hands or tie it to a life raft. Why is this?
1. The salt that adheres to it can make it a sharp cutting edge, an edge dangerous both to the raft and your hands. Wear gloves, if they are available, or use a cloth to handle fish and to avoid injury from sharp fins and gill covers.
451. In warm regions, why should you gut and bleed fish immediately after catching them?
1. Cut fish that you do not eat immediately into thin, narrow strips and hang them to dry. A well-dried fish stays edible for several days. Fish not cleaned and dried



may spoil in half a day. Fish with dark meat are very prone to decomposition. If you do not eat them all immediately, do not eat any of the leftovers.

452. What can fish leftovers be used for?
1. Use the leftovers for bait. Never eat fish that have pale, shiny gills, sunken eyes, flabby skin and flesh, or an unpleasant odor. Good fish show the opposite characteristics. Sea fish have a saltwater or clean fishy odor. Do not confuse eels with sea snakes that have an obviously scaly body and strongly compressed, paddle-shaped tail
453. Both eels and sea snakes are edible, but you must handle the latter with care because of their poisonous bites. What parts of these animals are edible?
1. The heart, blood, intestinal wall, and liver of most fish are edible. Cook the intestines. Also edible are the partly digested smaller fish that you may find in the stomachs of large fish. In addition, sea turtles are edible.
454. Shark meat is a good source of food whether raw, dried, or cooked. What are some considerations to make when processing shark meat?
1. Shark meat spoils very rapidly due to the high concentration of urea in the blood, therefore, bleed it immediately and soak it in several changes of water. People prefer some shark species over others. Consider them all edible except the Greenland shark whose flesh contains high quantities of vitamin A. Do not eat the livers, due to high vitamin A content.
455. What are some materials that can be used as fishing aids?
1. • Fishing line. Use pieces of tarpaulin or canvas. Unravel the threads and tie them together in short lengths in groups of three or more threads. Shoelaces and parachute suspension line also work well.
  2. • Fish hooks. No survivor at sea should be without fishing equipment but if you are, improvise hooks as shown in Chapter 8.
  3. • Fish lures. You can fashion lures by attaching a double hook to any shiny piece of metal.
  4. • Grapple. Use grapples to hook seaweed. You may shake crabs, shrimp, or small fish out of the seaweed. These you may eat or use for bait. You may eat seaweed itself, but only when you have plenty of drinking water. Improvise grapples from wood. Use a heavy piece of wood as the main shaft, and lash three smaller pieces to the shaft as grapples.
  5. • Bait. You can use small fish as bait for larger ones. Scoop the small fish up with a net. If you don't have a net, make one from cloth of some type. Hold the net under the water and scoop upward. Use all the guts from birds and fish for bait. When using bait, try to keep it moving in the water to give it the appearance of being alive.
456. Your fishing should be successful if you remember the following important hints:
1. • Be extremely careful with fish that have teeth and spines.
  2. • Cut a large fish loose rather than risk capsizing the raft. Try to catch small rather than large fish.
  3. • Do not puncture your raft with hooks or other sharp instruments.
  4. • Do not fish when large sharks are in the area.

5. • Watch for schools of fish; try to move close to these schools.
  6. • Fish at night using a light. The light attracts fish.
  7. • In the daytime, shade attracts some fish. You may find them under your raft.
  8. • Improvise a spear by tying a knife to an oar blade. This spear can help you catch larger fish, but you must get them into the raft quickly or they will slip off the blade. Also, tie the knife very securely or you may lose it.
  9. • Always take care of your fishing equipment. Dry your fishing lines, clean and sharpen the hooks, and do not allow the hooks to stick into the fishing lines.
457. Seasickness is the nausea and vomiting caused by the motion of the raft. What can it result in?
1. • Extreme fluid loss and exhaustion.
  2. • Loss of the will to survive.
  3. • Others becoming seasick.
  4. • Attraction of sharks to the raft.
  5. • Unclean conditions.
458. How can you treat seasickness?
1. • Wash both the patient and the raft to remove the sight and odor of vomit.
  2. • Keep the patient from eating food until his nausea is gone.
  3. • Have the patient lie down and rest.
  4. • Give the patient seasickness pills if available. If the patient is unable to take the pills orally, insert them rectally for absorption by the body.
459. How do Saltwater Sores form? How are they treated?
1. These sores result from a break in skin exposed to saltwater for an extended period. The sores may form scabs and pus. Do not open or drain. Flush the sores with fresh water, if available, and allow to dry. Apply an antiseptic, if available.
460. How does Blindness/Headache form? How are they treated?
1. If flame, smoke, or other contaminants get in the eyes, flush them immediately with salt water, then with fresh water, if available. Apply ointment, if available. Bandage both eyes 18 to 24 hours, or longer if damage is severe. If the glare from the sky and water causes your eyes to become bloodshot and inflamed, bandage them lightly. Try to prevent this problem by wearing sunglasses. Improvise sunglasses if necessary.
461. How is Difficult Urination treated?
1. This problem is not unusual and is due mainly to dehydration. It is best not to treat it, as it could cause further dehydration.
462. How is Sunburn prevented? How is it treated?
1. Sunburn is a serious problem in sea survival. Try to prevent sunburn by staying in shade and keeping your head and skin covered. Use cream or Chap Stick from your first aid kit. Remember, reflection from the water also causes sunburn.
463. Of the many hundreds of shark species, only about 20 species are known to attack man. What are some of the most dangerous species?
1. The most dangerous are the great white shark, the hammerhead, the mako, and the tiger shark. Other sharks known to attack man include the gray, blue, lemon,

sand, nurse, bull, and oceanic white tip sharks. Consider any shark longer than 1 meter dangerous.

464. There are sharks in all oceans and seas of the world. While many live and feed in the depths of the sea, others hunt near the surface. What does this mean?
1. The sharks living near the surface are the ones you will most likely see. Their dorsal fins frequently project above the water. Sharks in the tropical and subtropical seas are far more aggressive than those in temperate waters.
465. All sharks are basically eating machines. What do sharks normally prey on? How do they locate their prey?
1. Their normal diet is live animals of any type, and they will strike at injured or helpless animals. Sight, smell, or sound may guide them to their prey. Sharks have an acute sense of smell and the smell of blood in the water excites them. They are also very sensitive to any abnormal vibrations in the water. The struggles of a wounded animal or swimmer, underwater explosions, or even a fish struggling on a fishline will attract a shark.
466. Sharks can bite from almost any position; they do not have to turn on their side to bite. What does this mean?
1. The jaws of some of the larger sharks are so far forward that they can bite floating objects easily without twisting to the side.
467. Some of the measures that you can take to protect yourself against sharks when you are in the water are--
1. • Stay with other swimmers. A group can maintain a 360-degree watch. A group can either frighten
  2. or fight off sharks better than one man.
  3. • Always watch for sharks. Keep all your clothing on, to include your shoes. Historically, sharks have attacked the unclothed men in groups first, mainly in the feet. Clothing also protects against abrasions should the shark brush against you.
  4. • Avoid urinating. If you must, only do so in small amounts. Let it dissipate between discharges. If you must defecate, do so in small amounts and throw it as far away from you as possible. Do the same if you must vomit.
468. When you are in a raft and see sharks, what should you do?
1. • Do not fish. If you have hooked a fish, let it go. Do not clean fish in the water.
  2. • Do not throw garbage overboard.
  3. • Do not let your arms, legs, or equipment hang in the water.
  4. • Keep quiet and do not move around.
  5. • Bury all dead as soon as possible. If there are many sharks in the area, conduct the burial at night.
469. You should watch carefully for any signs of land. What are some indications that land is near?
1. There are many indicators that land is near. A fixed cumulus cloud in a clear sky or in a sky where all other clouds are moving often hovers over or slightly downwind from an island.

470. In the tropics, the reflection of sunlight from shallow lagoons or shelves of coral reefs often causes a greenish tint in the sky. What does this indicate?
1. In the arctic, light-colored reflections on clouds often indicate ice fields or snow-covered land. These reflections are quite different from the dark gray ones caused by open water. Deep water is dark green or dark blue. Lighter color indicates shallow water, which may mean land is near.
471. At night, or in fog, mist, or rain, you may detect land by odors and sounds. How can you use odors and sounds to locate land?
1. You hear the roar of surf long before you see the surf. The musty odor of mangrove swamps and mud flats carry a long way. The continued cries of seabirds coming from one direction indicate their roosting place on nearby land. There usually are more birds near land than over the open sea. The direction from which flocks fly at dawn and to which they fly at dusk may indicate the direction of land. During the day, birds are searching for food and the direction of flight has no significance.
472. How do mirages impact you in a survival situation?
1. Mirages occur at any latitude, but they are more likely in the tropics, especially during the middle of the day. Be careful not to mistake a mirage for nearby land. A mirage disappears or its appearance and elevation change when viewed from slightly different heights. You may be able to detect land by the pattern of the waves (refracted) as they approach land (Figure 16- 20). By traveling with the waves and parallel to the slightly turbulent area marked "X" on the illustration,
  2. you should reach land.
473. Once you have found land, you must get ashore safely. What are some considerations to get a raft to shore?
1. To raft ashore, you can usually use the one-man raft without danger. However, going ashore in a strong surf is dangerous. Take your time. Select your landing point carefully. Try not to land when the sun is low and straight in front of you. Try to land on the lee side of an island or on a point of land jutting out into the water. Keep your eyes open for gaps in the surf line, and head for them. Avoid coral reefs and rocky cliffs. There are no coral reefs near the mouths of freshwater streams. Avoid rip currents or strong tidal currents that may carry you far out to sea. Either signal ashore for help or sail around and look for a sloping beach where the surf is gentle. If you have to go through the surf to reach shore, take down the mast. Keep your clothes and shoes on to avoid severe cuts. Adjust and inflate your life vest. Trail the sea anchor over the stem using as much line as you have. Use the oars or paddles and constantly adjust the sea anchor to keep a strain on the anchor line. These actions will keep the raft pointed toward shore and prevent the sea from throwing the stern around and capsizing you. Use the oars or paddles to help ride in on the seaward side of a large wave.
474. What is a good method of getting a raft through the surf?
1. The surf may be irregular and velocity may vary, so modify your procedure as conditions demand. A good method of getting through the surf is to have half the men sit on one side of the raft, half on the other, facing away from each other.

When a heavy sea bears down, half should row (pull) toward the sea until the crest passes; then the other half should row (pull) toward the shore until the next heavy sea comes along. Against a strong wind and heavy surf, the raft must have all possible speed to pass rapidly through the oncoming crest to avoid being turned broadside or thrown end over end. If possible, avoid meeting a large wave at the moment it breaks.

475. If in a medium surf with no wind or offshore wind, what should you do?
1. keep the raft from passing over a wave so rapidly that it drops suddenly after topping the crest. If the raft turns over in the surf, try to grab hold of it and ride it in. As the raft nears the beach, ride in on the crest of a large wave. Paddle or row hard and ride in to the beach as far as you can. Do not jump out of the raft until it has grounded, then quickly get out and beach it.
476. Should you try to land at night?
1. If you have a choice, do not land at night. If you have reason to believe that people live on the shore, lay away from the beach, signal, and wait for the inhabitants to come out and bring you in. If you encounter sea ice, land only on large, stable floes. Avoid icebergs that may capsize and small floes or those obviously disintegrating. Use oars and hands to keep the raft from rubbing on the edge of the ice. Take the raft out of the water and store it well back from the floe's edge. You may be able to use it for shelter. Keep the raft inflated and ready for use. Any floe may break up without warning.
477. If rafting ashore is not possible and you have to swim, what should you do?
1. wear your shoes and at least one thickness of clothing. Use the sidestroke or breaststroke to conserve strength. If the surf is moderate, ride in on the back of a small wave by swimming forward with it. Dive to a shallow depth to end the ride just before the wave breaks. In high surf, swim toward shore in the trough between waves. When the seaward wave approaches, face it and submerge. After it passes, work toward shore in the next trough. If caught in the undertow of a large wave, push off the bottom or swim to the surface and proceed toward shore as above.
478. If you must land on a rocky shore, what should you do?
1. look for a place where the waves rush up onto the rocks. Avoid places where the waves explode with a high, white spray. Swim slowly when making your approach. You will need your strength to hold on to the rocks. You should be fully clothed and wear shoes to reduce injury. After selecting your landing point, Advance behind a large wave into the breakers. Face toward shore and take a sitting position with your feet in front, 60 to 90 centimeters (2 or 3 feet) lower than your head. This position will let your feet absorb the shock when you land or strike sub-merged boulders or reefs. If you do not reach shore behind the wave you picked, swim with your hands only. As the next wave approaches, take a sitting position with your feet forward. Repeat the procedure until you land. Water is quieter in the lee of a heavy growth of seaweed. Take advantage of such growth. Do not swim through the seaweed; crawl over the top by grasping the vegetation with overhand movements. Cross a rocky or coral reef as you would

land on a rocky shore. Keep your feet close together and your knees slightly bent in a relaxed sitting posture to cushion the blows against the coral.

479. If the helicopter recovery is unassisted, do the following before pickup:
1. • Secure all the loose equipment in the raft, accessory bag, or in pockets.
  2. • Deploy the sea anchor, stability bags, and accessory bag.
  3. • Partially deflate the raft and fill it with water.
  4. • Unsnap the survival kit container from the parachute harness.
  5. • Grasp the raft handhold and roll out of the raft.
  6. • Allow the recovery device or the cable to ground out on the water's surface.
  7. • Maintain the handhold until the recovery device is in your other hand.
  8. • Mount the recovery device, avoiding entanglement with the raft.
  9. • Signal the hoist operator for pickup.
480. Search planes or ships do not always spot a drifting raft or swimmer. What does this mean for you?
1. You may have to land along the coast before being rescued. Surviving along the seashore is different from open sea survival. Food and water are more abundant and shelter is obviously easier to locate and construct. If you are in friendly territory and decide to travel, it is better to move along the coast than to go inland. Do not leave the coast except to avoid obstacles (swamps and cliffs) or unless you find a trail that you know leads to human habitation. In time of war, remember that the enemy patrols most coastlines.
481. What problems does this present for you, and how can you overcome them?
1. These patrols may cause problems for you if you land on a hostile shore. You will have extremely limited travel options in this situation. Avoid all contact with other humans, and make every effort to cover all tracks you leave on the shore.
482. What hazards does Coral cause when landing on a costal area?
1. Coral, dead or alive, can inflict painful cuts. There are hundreds of water hazards that can cause deep puncture wounds, severe bleeding, and the danger of infection. Clean all coral cuts thoroughly. Do not use iodine to disinfect any coral cuts. Some coral polyps feed on iodine and may grow inside your flesh if you use iodine.
483. What hazards do fish toxins pose to you?
1. Fish toxins are water soluble--no amount of cooking will neutralize them. They are tasteless, therefore the standard edibility tests are use-less. Birds are least susceptible to the poisons. Therefore, do not think that because a bird can eat a fish, it is a safe species for you to eat. The toxins will produce a numbness of the lips, tongue, toes, and tips of the fingers, severe itching, and a clear reversal of temperature sensations. Cold items appear hot and hot items cold. There will probably also be nausea, vomiting, loss of speech, dizziness, and a paralysis that eventually brings death. In addition to fish with poisonous flesh, there are those that are dangerous to touch. Many stingrays have a poisonous barb in their tail. There are also species that can deliver an electric shock. Some reef fish, such as stonefish and toadfish, have venomous spines that can cause very painful although seldom fatal injuries. The venom from these spines causes a

burning sensation or even an agonizing pain that is out of proportion to the apparent severity of the wound. Jellyfish, while not usually fatal, can inflict a very painful sting if it touches you with its tentacles.

484. What are some examples of aggressive fish in coastal environments?
1. You should also avoid some ferocious fish. The bold and inquisitive barracuda has attacked men wearing shiny objects. It may charge lights or shiny objects at night. The sea bass, which can grow to 1.7 meters, is another fish to avoid. The moray eel, which has many sharp teeth and grows to 1.5 meters, can also be aggressive if disturbed.
485. Do Sea Snakes pose a threat to you in coastal environments?
1. Sea snakes are venomous and sometimes found in mid ocean. They are unlikely to bite unless provoked. Avoid them.
486. What threat do crocodiles pose to you in a survival environments?
1. Crocodiles inhabit tropical saltwater bays and mangrove-bordered estuaries and range up to 65 kilometers into the open sea. Few remain near inhabited areas. You commonly find crocodiles in the remote areas of the East Indies and Southeast Asia. Consider specimens over 1 meter long dangerous, especially females guarding their nests. Crocodile meat is an excellent source of food when available.
487. How do Sea Urchins, Sea Biscuits, Sponges, and Anemones impact your survival?
1. These animals can cause extreme, though seldom fatal, pain. Usually found in tropical shallow water near coral formations, sea urchins resemble small, round porcupines. If stepped on, they slip fine needles of lime or silica into the skin, where they break off and fester. If possible, remove the spines and treat the injury for infection. The other animals mentioned inflict injury similarly.
488. What hazards do Tides and Undertow pose to you at sea?
1. These are another hazard to contend with. If caught in a large wave's undertow, push off the bottom or swim to the surface and proceed shoreward in a trough between waves. Do not fight against the pull of the undertow. Swim with it or perpendicular to it until it loses strength, then swim for shore. If there is no high place, climb a tree.
489. Good crossing locations include--
1. • A level stretch where it breaks into several channels. Two or three narrow channels are usually easier to cross than a wide river.
  2. • A shallow bank or sandbar. If possible, select a point upstream from the bank or sandbar so that the current will carry you to it if you lose your footing.
  3. • A course across the river that leads downstream so that you will cross the current at about a 45- degree angle.
490. What areas near rivers are dangerous to be in?
1. • Obstacles on the opposite side of the river that might hinder your travel. Try to select the spot from which travel will be the safest and easiest.
  2. • A ledge of rocks that crosses the river. This often indicates dangerous rapids or canyons.

3. • A deep or rapid waterfall or a deep channel. Never try to ford a stream directly above or even close to such hazards.
  4. • Rocky places. You may sustain serious injuries from slipping or falling on rocks. Usually, submerged rocks are very slick, making balance extremely difficult. An occasional rock that breaks the current, however, may help you.
  5. • An estuary of a river. An estuary is normally wide, has strong currents, and is subject to tides. These tides can influence some rivers many kilometers from their mouths. Go back upstream to an easier crossing site.
  6. • Eddies. An eddy can produce a powerful backward pull downstream of the obstruction causing the eddy and pull you under the surface.
491. Is the depth of a river and inherent measure of it's safety?
1. No. The depth of a fordable river or stream is no deterrent if you can keep your footing. In fact, deep water sometimes runs more slowly and is therefore safer than fast-moving shallow water. You can always dry your clothes later, or if necessary, you can make a raft to carry your clothing and equipment across the river. You must not try to swim or wade across a stream or river when the water is at very low temperatures. This swim could be fatal. Try to make a raft of some type. Wade across if you can get only your feet wet. Dry them vigorously as soon as you reach the other bank.
492. If necessary, you can safely cross a deep, swift river or rapids. How should you cross a deep, swift river?
1. To swim across a deep, swift river, swim with the current, never fight it. Try to keep your body horizontal to the water. This will reduce the danger of being pulled under.
493. How should you cross fast, shallow rapids?
1. In fast, shallow rapids, lie on your back, feet pointing downstream, finning your hands alongside your hips. This action will increase buoyancy and help you steer away from obstacles. Keep your feet up to avoid getting them bruised or caught by rocks.
494. How should you cross, deep rapids?
1. In deep rapids, lie on your stomach, head downstream, angling toward the shore whenever you can. Watch for obstacles and be careful of backwater eddies and converging currents, as they often contain dangerous swirls. Converging currents occur where new water courses enter the river or where water has been diverted around large obstacles such as small islands.
495. To ford a swift, treacherous stream, apply the following steps:
1. • Remove your pants and shirt to lessen the water's pull on you. Keep your footgear on to protect your feet and ankles from rocks. It will also provide you with firmer footing.
  2. • Tie your pants and other articles to the top of your rucksack or in a bundle, if you have no pack. This way, if you have to release your equipment, all your articles will be together. It is easier to find one large pack than to find several small items.



3. • Carry your pack well up on your shoulders and be sure you can easily remove it, if necessary.
  4. Not being able to get a pack off quickly enough can drag even the strongest swimmers under.
  5. Find a strong pole about 7.5 centimeters in diameter and 2.1 to 2.4 meters long to help you ford the stream. Grasp the pole and plant it firmly on your upstream side to break the current. Plant your feet firmly with each step, and move the pole forward a little downstream from its previous position, but still upstream from you. With your next step, place your foot below the pole. Keep the pole well slanted so that the force of the current keeps the pole against your shoulder (Figure 17-1).
  6. • Cross the stream so that you will cross the downstream current at a 45-degree angle.
496. The brush raft, if properly constructed, will support about 115 kilograms. To construct it, use ponchos, fresh green brush, two small saplings, and rope or vine as follows:
1. • Push the hood of each poncho to the inner side and tightly tie off the necks using the drawstrings.
  2. • Attach the ropes or vines at the corner and side grommets of each poncho. Make sure they are long enough to cross to and tie with the others attached at the opposite corner or side.
  3. • Spread one poncho on the ground with the inner side up. Pile fresh, green brush (no thick branches) on the poncho until the brush stack is about 45 centimeters high. Pull the drawstring up through the center of the brush stack.
  4. • Make an X-frame from two small saplings and place it on top of the brush stack. Tie the X-frame securely in place with the poncho drawstring.
  5. • Pile another 45 centimeters of brush on top of the X-frame, then compress the brush slightly.
  6. • Pull the poncho sides up around the brush and, using the ropes or vines attached to the corner or side grommets, tie them diagonally from corner to corner and from side to side.
  7. • Spread the second poncho, inner side up, next to the brush bundle.
  8. • Roll the brush bundle onto the second poncho so that the tied side is down. Tie the second poncho around the brush bundle in the same manner as you tied the first poncho around the brush.
  9. • Place it in the water with the tied side of the second poncho facing up.
497. Australian Poncho Raft
1. If you do not have time to gather brush for a brush raft, you can make an Australian poncho raft. This raft, although more waterproof than the poncho brush raft, will only float about 35 kilograms of equipment. To construct this raft, use two ponchos, two rucksacks, two 1.2-meter poles or branches, and ropes, vines, bootlaces, or comparable material as follows (Figure 17-5):
498. How can you construct an Australian poncho raft?
1. • Push the hood of each poncho to the inner side and tightly tie off the necks using the drawstrings.

2. • Spread one poncho on the ground with the inner side up. Place and center the two 1.2-meter poles on the poncho about 45 centimeters apart.
  3. • Place your rucksacks or packs or other equipment between the poles. Also place other items that you want to keep dry between the poles. Snap the poncho sides together.
  4. • Use your buddy's help to complete the raft. Hold the snapped portion of the poncho in the air and roll it tightly down to the equipment. Make sure you roll the full width of the poncho.
  5. • Twist the ends of the roll to form pigtails in opposite directions. Fold the pigtails over the bundle and tie them securely in place using ropes, bootlaces, or vines.
  6. • Spread the second poncho on the ground, inner side up. If you need more buoyancy, place some fresh green brush on this poncho.
  7. • Place the equipment bundle, tied side down, on the center of the second poncho. Wrap the second poncho around the equipment bundle following the same procedure you used for wrapping the equipment in the first poncho.
  8. • Tie ropes, bootlaces, vines, or other binding material around the raft about 30 centimeters from the end of each pigtail. Place and secure weapons on top of the raft.
499. Poncho Donut Raft. Another type of raft is the poncho donut raft. It takes more time to construct than the brush raft or Australian poncho raft, but it is effective. To construct it, use one poncho, small saplings, willow or vines, and rope, bootlaces, or other binding material (Figure 17-6) as follows:
1. • Make a framework circle by placing several stakes in the ground that roughly outline an inner and outer circle.
  2. • Using young saplings, willow, or vines, construct a donut ring within the circles of stakes.
  3. • Wrap several pieces of cordage around the donut ring about 30 to 60 centimeters apart and tie them securely.
  4. • Push the poncho's hood to the inner side and tightly tie off the neck using the drawstring.
  5. • Place the poncho on the ground, inner side up. Place the donut ring on the center of the poncho. Wrap the poncho up and over the donut ring and tie off each grommet on the poncho to the ring.
  6. • Tie one end of a rope to an empty canteen and the other end to the raft. This rope will help you to tow the raft.
500. How do you construct a log raft?
1. You can make a raft using any dry, dead, standing trees for logs. However, spruce trees found in polar and subpolar regions make the best rafts. A simple method for making a raft is to use pressure bars lashed securely at each end of the raft to hold the logs together (Figure 17-7).
501. How can logs and cattails be used as flotation devices?
1. Logs. Use a stranded drift log if one is available, or find a log near the water to use as a float. Be sure to test the log before starting to cross. Some tree logs, palm for example, will sink even when the wood is dead. Another method is to tie

two logs about 60 centimeters apart. Sit between the logs with your back against one and your legs over the other (Figure 17-8).

2. • Cattails. Gather stalks of cattails and tie them in a bundle 25 centimeters or more in diameter. The many air cells in each stalk cause a stalk to float until it rots. Test the cattail bundle to be sure it will support your weight before trying to cross a body of water. If the water is warm enough for swimming and you do not have the time or materials to construct one of the poncho-type rafts, you can use various flotation devices to negotiate the water obstacle.
502. Some items you can use for flotation devices are--
1. • Trousers. Knot each trouser leg at the bottom and close the fly. With both hands, grasp the waistband at the sides and swing the trousers in the air to trap air in each leg. Quickly press the sides of the waistband together and hold it underwater so that the air will not escape. You now have water wings to keep you afloat as you cross the body of water. Note: Wet the trousers before inflating to trap the air better. You may have to reinflate the trousers several times when crossing a large body of water.
  2. • Empty containers. Lash together her empty gas cans, water jugs, ammo cans, boxes, or other items that will trap or hold air. Use them as water wings. Use this type of flotation device only in a slow-moving river or stream.
  3. • Plastic bags and ponchos. Fill two or more plastic bags with air and secure them together at the opening. Use your poncho and roll green vegetation tightly inside it so that you have a roll at least 20 centimeters in diameter. Tie the ends of the roll securely. You can wear it around your waist or across one shoulder and under the opposite arm.
503. What are some other water obstacles you face?
1. Other water obstacles that you may face are bogs, quagmire, muskeg, or quicksand. Do not try to walk across these. Trying to lift your feet while standing upright will make you sink deeper. Try to bypass these obstacles. If you are unable to bypass them, you may be able to bridge them using logs, branches, or foliage. A way to cross a bog is to lie face down, with your arms and legs spread. Use a flotation device or form pockets of air in your clothing. Swim or pull your way across moving slowly and trying to keep your body horizontal.
  2. In swamps, the areas that have vegetation are usually firm enough to support your weight. However, vegetation will usually not be present in open mud or water areas. If you are an average swimmer, however, you should have no problem swimming, crawling, or pulling your way through miles of bog or swamp.
  3. Quicksand is a mixture of sand and water that forms a shifting mass. It yields easily to pressure and sucks down and engulfs objects resting on its surface. It varies in depth and is usually localized. Quicksand commonly occurs on flat shores, in silt-choked rivers with shifting watercourses, and near the mouths of large rivers. If you are uncertain whether a sandy area is quicksand, toss a small stone on it. The stone will sink in quicksand. Although quicksand has more suction than mud or muck, you can cross

4. it just as you would cross a bog. Lie face down, spread your arms and legs, and move slowly across.
504. Can underwater obstacles impact movements in the water?
1. Some water areas you must cross may have underwater and floating plants that will make swimming difficult. However, you can swim through relatively dense vegetation if you remain calm and do not thrash about. Stay as near the surface as possible and use the breaststroke with shallow leg and arm motion. Remove the plants around you as you would clothing. When you get tired, float or swim on your back until you have rested enough to continue with the breaststroke.
505. What is a mangrove swamp?
506. How can you effectively navigate through mangrove swamps?
1. To get through a mangrove swamp, wait for low tide. If you are on the inland side, look for a narrow grove of trees and work your way seaward through these. You can also try to find the bed of a waterway or creek through the trees and follow it to the sea. If you are on the seaward side, work inland along streams or channels. Be on the lookout for crocodiles that you find along channels and in shallow water. If there are any near you, leave the water and scramble over the mangrove roots. While crossing a mangrove swamp, it is possible to gather food from tidal pools or tree roots. To cross a large swamp area, construct some type of raft.
507. How can you use the sun and shadows to determine your direction on earth?
1. The earth's relationship to the sun can help you to determine direction on earth. The sun always rises in the east and sets in the west, but not exactly due east or due west. There is also some seasonal variation. In the northern hemisphere, the sun will be due south when at its highest point in the sky, or when an object casts no appreciable shadow. In the southern hemisphere, this same noonday sun will mark due north. In the northern hemisphere, shadows will move clockwise. Shadows will move counterclockwise in the southern hemisphere. With practice, you can use shadows to determine both direction and time of day. The shadow methods used for direction finding are the shadow-tip and watch methods.
508. How can you use the first shadow-tip method to determine your direction?
509. How can you use the alternate shadow-tip method to determine your direction?
1. In the first shadow-tip method, find a straight stick 1 meter long, and a level spot free of brush on which the stick will cast a definite shadow. This method is simple and accurate and consists of four steps:
  2. • Step 1. Place the stick or branch into the ground at a level spot where it will cast a distinctive shadow. Mark the shadow's tip with a stone, twig, or other means. This first shadow mark is always west--everywhere on earth.
  3. • Step 2. Wait 10 to 15 minutes until the shadow tip moves a few centimeters. Mark the shadow tip's new position in the same way as the first.
  4. • Step 3. Draw a straight line through the two marks to obtain an approximate east-west line.
  5. • Step 4. Stand with the first mark (west) to your left and the second mark to your right--you are now facing north. This fact is true everywhere on earth.

6. An alternate method is more accurate but requires more time. Set up your shadow stick and mark the first shadow in the morning. Use a piece of string to draw a clean arc through this mark and around the stick. At midday, the shadow will shrink and disappear. In the afternoon, it will lengthen again and at the point where it touches the arc, make a second mark. Draw a line through the two marks to get an accurate east-west line (see Figure 18-1).
510. You can also determine direction using a common or analog watch--one that has hands. How can you do this?
1. The direction will be accurate if you are using true local time, without any changes for daylight savings time. Remember, the further you are from the equator, the more accurate this method will be. If you only have a digital watch, you can overcome this obstacle. Quickly draw a watch on a circle of paper with the correct time on it and use it to determine your direction at that time. In the northern hemisphere, hold the watch horizontal and point the hour hand at the sun. Bisect the angle between the hour hand and the 12 o'clock mark to get the north-south line (Figure 18-2). If there is any doubt as to which end of the line is north, remember that the sun rises in the east, sets in the west, and is due south at noon. The sun is in the east before noon and in the west after noon.
511. Because the moon has no light of its own, we can only see it when it reflects the sun's light. How can the shape of the moon help you navigate at night?
1. As it orbits the earth on its 28-day circuit, the shape of the reflected light varies according to its position. We say there is a new moon or no moon when it is on the opposite side of the earth from the sun. Then, as it moves away from the earth's shadow, it begins to reflect light from its right side and waxes to become a full moon before waning, or losing shape, to appear as a sliver on the left side. You can use this information to identify direction. If the moon rises before the sun has set, the illuminated side will be the west. If the moon rises after midnight, the illuminated side will be the east. This obvious discovery provides us with a rough east-west reference during the night.
512. How can you use constellations to navigate at night?
1. Your location in the Northern or Southern Hemisphere determines which constellation you use to determine your north or south direction. The main constellations to learn are the Ursa Major, also known as the Big Dipper or the Plow, and Cassiopeia (Figure 18-3). Neither of these constellations ever sets. They are always visible on a clear night. Use them to locate Polaris, also known as the polestar or the North Star. The North Star forms part of the Little Dipper handle and can be confused with the Big Dipper. Prevent confusion by using both the Big Dipper and Cassiopeia together. The Big Dipper and Cassiopeia are always directly opposite each other and rotate counterclockwise around Polaris, with Polaris in the center. The Big Dipper is a seven star constellation in the shape of a dipper. The two stars forming the outer lip of this dipper are the "pointer stars" because they point to the North Star. Mentally draw a line from the outer bottom star to the outer top star of the Big Dipper's bucket. Extend this line

about five times the distance between the pointer stars. You will find the North Star along this line.

513. How are constellations used to navigation in the southern sky?
1. Because there is no star bright enough to be easily recognized near the south celestial pole, a constellation known as the Southern Cross is used as a signpost to the South (Figure 18-4). The Southern Cross or Crux has five stars. Its four brightest stars form a cross that tilts to one side. The two stars that make up the cross's long axis are the pointer stars. To determine south, imagine a distance five times the distance between These stars and the point where this imaginary line ends is in the general direction of south. Look down to the horizon from this imaginary point and select a landmark to steer by. In a static survival situation, you can fix this location in daylight if you drive stakes in the ground at night to point the way.
514. How can you make improvised compasses?
1. You can construct improvised compasses using a piece of ferrous metal that can be needle shaped or a flat double-edged razor blade and a piece of nonmetallic string or long hair from which to suspend it. You can magnetize or polarize the metal by slowly stroking it in one direction on a piece of silk or carefully through your hair using deliberate strokes. You can also polarize metal by stroking it repeatedly at one end with a magnet. Always rub in one direction only. If you have a battery and some electric wire, you can polarize the metal electrically. The wire should be insulated. If not insulated, wrap the metal object in a single, thin strip of paper to prevent contact. The battery must be a minimum of 2 volts. Form a coil with the electric wire and touch its ends to the battery's terminals. Repeatedly insert one end of the metal object in and out of the coil. The needle will become an electromagnet. When suspended from a piece of nonmetallic string, or floated on a small piece of wood in water, it will align itself with a north-south line.
515. What is another methods for constructing an improvised compass?
1. You can construct a more elaborate improvised compass using a sewing needle or thin metallic object, a nonmetallic container (for example, a plastic dip container), its lid with the center cut out and waterproofed, and the silver tip from a pen. To construct this compass, take an ordinary sewing needle and break in half. One half will form your direction pointer and the other will act as the pivot point. Push the portion used as the pivot point through the bottom center of your container; this portion should be flush on the bottom and not interfere with the lid. Attach the center of the other portion (the pointer) of the needle on the pen's silver tip using glue, tree sap, or melted plastic. Magnetize one end of the pointer and rest it on the pivot point.
516. Is true that moss growth indicates north? What are alternate methods to determine direction using natural growth?
1. The old saying about using moss on a tree to indicate north is not accurate because moss grows completely around some trees. Actually, growth is more

lush on the side of the tree facing the south in the Northern Hemisphere and vice versa in the Southern Hemisphere.

2. The side of the tree facing the south in the Northern Hemisphere and vice versa in the Southern Hemisphere. If there are several felled trees around for comparison, look at the stumps. Growth is more vigorous on the side toward the equator and the tree growth rings will be more widely spaced. On the other hand, the tree growth rings will be closer together on the side toward the poles. Wind direction may be helpful in some instances where there are prevailing directions and you know what they are. Recognizing the differences between vegetation and moisture patterns on north- and south-facing slopes
  3. can aid in determining direction. In the northern hemisphere, north-facing slopes receive less sun than south-facing slopes and are therefore cooler and damper. In the summer, north-facing slopes retain patches of snow. In the winter, the trees and open areas on south-facing slopes are the first to lose their snow, and ground snowpack is shallower.
517. When in a noncombat situation, where should you go to find a signaling location?
1. If in a noncombat situation, you need to find the largest available clear and flat area on the highest possible terrain. Use as obvious a signal as you can create. On the other hand, you will have to be more discreet in combat situations. You do not want to signal and attract the enemy. Pick an area that is visible from the air, but ensure there are hiding places nearby. Try to have a hill or other object between the signal site and the enemy to mask your signal from the enemy. Perform a thorough reconnaissance of the area to ensure there are no enemy forces nearby.
518. What should you ensure about your signaling device before it is used?
1. Whatever signaling technique or device you plan to use, know how to use it and be ready to put it into operation on short notice. If possible, avoid using signals or signaling techniques that can physically endanger you. Keep in mind that signals to your friends may alert the enemy of your presence and location. Before signaling, carefully weigh your rescue chances by friends against the danger of capture by the enemy.
519. What is one of the best signaling devices you can use?
1. A radio is probably the surest and quickest way to let others know where you are and to let you receive their messages. Become familiar with the radios in your unit. Learn how to operate them and how to send and receive messages.
520. How can you ensure more effective use of signaling techniques when in a survival situation?
1. You will find descriptions of other signaling techniques, devices, and articles you can use. Learn how to use them. Think of ways in which you can adapt or change them for different environments. Practice using these signaling techniques, devices, and articles before you need them. Planned, prearranged signaling techniques may improve your chance of rescue.
521. Can fire be an effective signaling method? How should fire be used as a signaling method?

1. During darkness, fire is the most effective visual means for signaling. Build three fires in a triangle (the international distress signal) or in a straight line with about 25 meters between the fires. Build them as soon as time and the situation permit and protect them until you need them. If you are alone, maintaining three fires may be difficult. If so, maintain one signal fire.
522. When constructing signal fires, what should you consider?
  1. Consider your geographic location. If in a jungle, find a natural clearing or the edge of a stream where you can build fires that the jungle foliage will not hide. You may even have to clear an area.
523. If in a snow-covered area, you may have to clear the ground of snow or make a platform on which to build the fire so that melting snow will not extinguish it. What are some alternate signaling methods?
  1. A burning tree (tree torch) is another way to attract attention (Figure 19-1). You can set pitch-bearing trees afire, even when green. You can get other types of trees to burn by placing dry wood in the lower branches and igniting it so that the flames flare up and ignite the foliage. Before the primary tree is consumed, cut and add more small green trees to the fire to produce more smoke. Always select an isolated tree so that you do not start a forest fire and endanger yourself.
524. How can you use smoke signals to indicate distress?
  1. During daylight, build a smoke generator and use smoke to gain attention (Figure 19-2). The international distress signal is three columns of smoke. Try to create a color of smoke that contrasts with the background; dark smoke against a light background and vice versa. If you practically smother a large fire with green leaves, moss, or a little water, the fire will produce white smoke. If you add rubber or oil-soaked rags to a fire, you will get black smoke.
525. How can you use Smoke Grenades to signal distress?
  1. If you have smoke grenades with you, use them in the same pattern as described for fires. Keep them dry so that they will work when you need them. Take care not to ignite the vegetation in the area when you use them.
526. How can you use pen flares to signal distress?
  1. These flares are part of an aviator's survival vest. The device consists of a pen-shaped gun with a flare attached by a nylon cord. When fired, the pen flare sounds like a pistol shot and fires the flare about 150 meters high. It is about 3 centimeters in diameter.
  2. To have the pen flare ready for immediate use, take it out of its wrapper, attach the flare, leave the gun uncocked, and wear it on a cord or chain around your neck. Be ready to fire it in front of search aircraft and be ready with a secondary signal. Also, be ready to take cover in case the pilot mistakes the flare for enemy fire.
527. How can tracer ammunition be used as a signaling method? What are important considerations when using tracer ammunition as a signaling method?
  1. You may use rifle or pistol tracer ammunition to signal search aircraft. Do not fire the ammunition in front of the aircraft. As with pen flares, be ready to take cover if the pilot mistakes your tracers for enemy fire.



528. How can star clusters be used as a signaling method? How long do they burn for?
1. Red is the international distress color; therefore, use a red star cluster whenever possible. Any color, however, will let your rescuers know where you are. Star clusters reach a height of 200 to 215 meters, burn an average of 6 to 10 seconds, and descend at a rate of 14 meters per second.
529. How can star parachute flares be used as a signaling method? How long do they burn for?
1. These flares reach a height of 200 to 215 meters and descend at a rate of 2.1 meters per second. The M126 (red) burns about 50 seconds and the M127 (white) about 25 seconds. At night you can see these flares at 48 to 56 kilometers.
530. How can Mirrors or Shiny Objects be used as a signaling method?
1. On a sunny day, a mirror is your best signaling device. If you don't have a mirror, polish your canteen cup, your belt buckle, or a similar object that will reflect the sun's rays. Direct the flashes in one area so that they are secure from enemy observation. Practice using a mirror or shiny object for signaling now; do not wait until you need it. If you have an MK-3 signal mirror, follow the instructions on its back (Figure 19-3).
531. How can Flashlight or Strobe Lights be used to signal for help?
1. At night you can use a flashlight or a strobe light to send an SOS to an aircraft. When using a strobe light, take care to prevent the pilot from mistaking it for incoming ground fire. The strobe light flashes 60 times per minute. Some strobe lights have infrared covers and lenses. Blue flash collimators are also available for strobe lights.
532. How can VS-17 panels be used to signal for help?
1. During daylight you can use a VS-17 panel to signal. Place the orange side up as it is easier to see from the air than the violet side. Flashing the panel will make it easier for the aircrew to spot. You can use any bright orange or violet cloth as a substitute for the VS-17.
533. How can clothing be used to signal for help?
1. Spreading clothing on the ground or in the top of a tree is another way to signal. Select articles whose color will contrast with the natural surroundings. Arrange them in a large geometric pattern to make them more likely to attract attention.
534. How can Natural Materials be used to signal for help?
1. If you lack other means, you can use natural materials to form a symbol or message that can be seen from the air. Build mounds that cast shadows; you can use brush, foliage of any type, rocks, or snow blocks. In snow-covered areas, tramp the snow to form letters or symbols and fill the depression with contrasting material (twigs or branches). In sand, use boulders, vegetation, or seaweed to form a symbol or message. In brush-covered areas, cut out patterns in the vegetation or sear the ground. In tundra, dig trenches or turn the sod upside down. In any terrain, use contrasting materials that will make the symbols visible to the aircrews.
535. How can Sea Dye Markers be used to signal for help?

1. All Army aircraft involved in operations near or over water will normally carry a water survival kit that contains sea dye markers. If you are in a water survival situation, use sea dye markers during daylight to indicate your location. These spots of dye stay conspicuous for about 3 hours, except in very rough seas. Use them only if you are in a friendly area. Keep the markers wrapped until you are ready to use them. Use them only when you hear or sight an aircraft. Sea dye markers are also very effective on snow-covered ground; use them to write distress code letters.
536. How can Radio Equipment be used to signal for help?
1. The AN/PRC-90 survival radio is a part of the Army aviator's survival vest. The AN/PRC-112 will eventually replace the AN/PRC-90. Both radios can transmit either tone or voice. Any other type of Army radio can do the same. The ranges of the different radios vary depending on the altitude of the receiving aircraft, terrain, vegetation density, weather, battery strength, type of radio, and interference.
537. To obtain maximum performance from radios, use the following procedures:
1. • Try to transmit only in clear, unobstructed terrain. Since radios are line-of-sight communications devices, any terrain between the radio and the receiver will block the signal.
  2. • Keep the antenna at right angles to the rescuing aircraft. There is no signal from the tip of the antenna.
  3. • If the radio has tone capability, place it upright on a flat, elevated surface so that you can perform other survival tasks.
  4. • Never let the antenna touch your clothing, body, foliage, or the ground. Such contact greatly reduces the range of the signal.
  5. • Conserve battery power. Turn the radio off when you are not using it. Do not transmit or receive constantly. In hostile territory, keep transmissions short to avoid enemy radio direction finding.
  6. • In cold weather, keep the battery inside your clothing when not using the radio. Cold quickly drains the battery's power. Do not expose the battery to extreme heat such as desert sun. High heat may cause the battery to explode. Try to keep the radio and battery as dry as possible, as water may destroy the circuitry.
538. Whistles can be used to signal for help. How can they best be used effectively?
1. Whistles provide an excellent way for close up signaling. In some documented cases, they have been heard up to 1.6 kilometers away. Manufactured whistles have more range than a human whistle.
539. What is the code for SOS?
1. You can use lights or flags to send an SOS--three dots, three dashes, three dots. The SOS is the internationally recognized distress signal in radio Morse code. A dot is a short, sharp pulse; a dash is a longer pulse. Keep repeating the signal. When using flags, hold flags on the left side for dashes and on the right side for dots.
540. What is the Ground-to-Air Emergency Code?

1. This code (Figure 19-6) is actually five definite, meaningful symbols. Make these symbols a minimum of 1 meter wide and 6 meters long. If you make them larger, keep the same 1: 6 ratio. Ensure the signal contrasts greatly with the ground it is on. Place it in an open area easily spotted from the air.
541. What signals do Body Signals use to signal for help?
  1. When an aircraft is close enough for the pilot to see you clearly, use body movements or positions (Figure 19-7) to convey a message.
542. What are Panel Signals used to signal for help?
  1. If you have a life raft cover or sail, or a suitable substitute, use the symbols shown in Figure 19-8 to convey a message.
543. What are methods used to show Aircraft Acknowledgment of your signal?
  1. Once the pilot of a fixed-wing aircraft has sighted you, he will normally indicate he has seen you by flying low, moving the plane, and flashing lights as shown in Figure 19-9. Be ready to relay other messages to the pilot once he acknowledges that he received and understood your first message. Use a radio, if possible, to relay further messages. If no radio is available, use the codes covered in the previous paragraphs.
544. What are aircraft vectoring procedures?
  1. If you can contact a friendly aircraft with a radio, guide the pilot to your location. Use the following general format to guide the pilot:
  2. • Mayday, Mayday.
  3. • Call sign (if any).
  4. • Name.
  5. • Location.
  6. • Number of survivors.
  7. • Available landing sites.
  8. • Any remarks such as medical aid or other specific types of help needed immediately.
545. What are phases of planning for rescue missions?
  1. Preparation is a requirement for all missions. When planning, you must consider how to avoid capture and return to your unit. Contingency plans must be prepared in conjunction with unit standing operating procedures (SOPs). Courses of action you or your unit will take must also be considered. Intelligence sections can help prepare personnel for rescue operations by: contingency actions through information supplied in area studies, SERE (survival, evasion, resistance, and escape) contingency guides, threat briefings, current intelligence reports, and current contact and authentication procedures. Pre-mission preparation includes the completion of a CPA. The study and research needed to develop the CPA will make you aware of the current situation in your mission area. Your CPA will let recovery forces know your probable
  2. actions should you have to move to avoid capture.
546. How do unit SOPs impact actions during recovery operations? What items should the SOP include?

1. Unit SOPs are valuable tools your unit has that will help your planning. When faced with a dangerous situation requiring immediate action, it is not the time to discuss options; it is the time to act. Many of the techniques used during small unit movement can be carried over to fit requirements for moving and returning to friendly control. Items from the SOP should include, but are not limited to--
    2. • Movement team size (three to four persons per team).
    3. • Team communications (technical and nontechnical).
    4. • Essential equipment.
    5. • Actions at danger areas.
    6. • Signaling techniques.
    7. • Immediate action drills.
    8. • Linkup procedures.
    9. • Helicopter recovery devices and procedures.
    10. • Security procedures during movement and at hide sites.
    11. • Rally points.
547. An isolated unit has several general courses of action it can take to avoid the capture of the group or individuals. What are they and how do they help commanders during mission planning?
1. These courses of action are not courses the commander can choose instead of his original mission. He cannot arbitrarily abandon the assigned mission. Rather, he may adopt these courses of action after completing his mission when his unit cannot complete its assigned mission (because of combat power losses) or when he receives orders to extract his unit from its current position. If such actions are not possible, the commander may decide to have the unit try to move to avoid capture and return to friendly control. In either case, as long as there is communication with higher headquarters, that headquarters will make the decision.
548. If the unit commander loses contact with higher headquarters, he must make the decision to move or wait. What factors does he base these decisions on?
1. He bases his decision on many factors, including the mission, rations and ammunition on hand, casualties, the chance of relief by friendly forces, and the tactical situation. The commander of an isolated unit faces other questions.
  2. What course of action will inflict maximum damage on the enemy?
  3. What course of action will assist in completing the higher headquarters' overall mission? When should movement teams execute their portion of the plan?
  4. What should be done when there is no communication with higher command?
  5. Movement teams conduct the execution portion of the plan when notified by higher headquarters or, if there is no contact with higher headquarters, when the highest ranking survivor decides that the situation requires the unit to try to escape capture or destruction. Movement team leaders receive their notification through prebriefed signals. Once the signal to try to avoid capture is given, it must be passed rapidly to all personnel. Notify higher headquarters, if possible. If unable to communicate with higher headquarters, leaders must recognize that organized resistance has ended, and that organizational control has ceased.

Command and control is now at the movement team or individual level and is returned to higher organizational control only after reaching friendly lines.

549. What should be done upon orders to avoid capture?
1. Upon notification to avoid capture, all movement team members will try to link up at the initial movement point. This point is where team members rally and actually begin their movement. Tentatively select the initial movement point during your planning phase through a map recon. Once on the ground, the team verifies this location or selects a better one. All team members must know its location. The initial movement point should be easy to locate and occupy for a minimum amount of time.
550. Once the team has rallied at the initial movement point, it must do what?
1. • Give first aid.
  2. • Inventory its equipment (decide what to abandon, destroy, or take along).
  3. • Apply camouflage.
  4. • Make sure everyone knows the tentative hide locations.
  5. • Ensure everyone knows the primary and alternate routes and rally points en route to the hide locations.
  6. • Always maintain security.
  7. • Split the team into smaller elements. The ideal element should have two to three members; however, it could include more depending on team equipment and experience.
551. What portion of returning to friendly control is the most dangerous?
1. The movement portion of returning to friendly control is the most dangerous as you are now most vulnerable. It is usually better to move at night because of the concealment darkness offers. Exceptions to such movement would be when moving through hazardous terrain or dense vegetation (for example, jungle or mountainous terrain).
552. When moving, avoid the following areas even if it takes more time and energy to bypass:
1. • Obstacles and barriers.
  2. • Roads and trails.
  3. • Inhabited areas.
  4. • Waterways and bridges.
  5. • Natural lines of drift.
  6. • Man-made structures.
  7. • All civilian and military personnel.
553. What are good protocols to follow when moving in enemy territory?
1. Movement in enemy-held territory is a very slow and deliberate process. The slower you move and the more careful you are, the better. Your best security will be using your senses. Use your eyes and ears to detect people before they detect you. Make frequent listening halts. In daylight, observe a section of your route before you move along it. The distance you travel before you hide will depend on the enemy situation, your health, the terrain, the availability of cover and concealment for hiding, and the amount of darkness left.

554. Once you have moved into the area in which you want to hide (hide area), select a hide site. Keep the following formula in mind when selecting a hide site: BLISS. What are the components of BLISS?
1. B - Blends in with the surroundings.
  2. L - Low in silhouette.
  3. I - Irregular in shape.
  4. S - Small in size.
  5. S - Secluded.
555. After you have located your hide site, do not move straight into it. What should you do instead?
1. Use a button hook or other deceptive technique to move to a position outside of the hide site. Conduct a listening halt before moving individually into the hide site. Be careful not to disturb or cut any vegetation. Once you have occupied the hide site, limit your activities to maintaining security, resting, camouflaging, and planning your next moves.
556. What actions should be taken once you have established a hide site?
1. Maintain your security through visual scanning and listening. Upon detection of the enemy, the security personnel alert all personnel, even if the team's plan is to stay hidden and not move upon sighting the enemy. Take this action so that everyone is aware of the danger and ready to react. If any team member leaves the team, give him a five-point contingency plan. Take such steps especially when a recon team or a work party is out of the hole-up or hide site. Camouflage is an important aspect of both moving and securing a hide site. Always use a buddy system to ensure that camouflage is complete. Ensure that team members blend with the hide site. Use natural or man-made materials. If you add any additional camouflage material to the hide site, do not cut vegetation in the immediate area.
557. It is extremely important to stay healthy and alert when trying to avoid capture. Take every opportunity to rest, but do not sacrifice security. What is the best way to manage rest cycles while maintaining security?
1. Rotate security so that all members of your movement team can rest. Treat all injuries, no matter how minor. Loss of your health will mean loss of your ability to continue to avoid capture.
558. What are additional actions that should be taken at the hide site?
1. Inform all team members of their current location and designate an alternate hide site location. Once this is done, start planning for the team's next movement. Plan your next actions while at the hide site. Start your planning process immediately upon occupying the hide site.
559. After moving and hiding for several days, usually three or four, you or the movement team will have to move into a hole-up area. What is a hole-up area?
1. This is an area where you can rest, recuperate, and get and prepare food.
  2. Choose an area near a water source. You then have a place to get water, to place fishing devices, and to trap game. Since waterways are a line of communication, locate your hide site well away from the water. The hole-up area

should offer plenty of cover and concealment for movement in and around the area. Always maintain security while in the hole-up area. Always man the hole-up area. Actions in the hole-up area are the same as in hide site, except that you can move away from the hole-up area to get and prepare food.

560. Actions in the hole-up area include--
1. • Selecting and occupying the next hide site (remember you are still in a dangerous situation; this is not a friendly area).
  2. • Reconnoitering the area for resources and potential concealed movement routes to the alternate hide site.
  3. • Gathering food (nuts, berries, vegetables). When moving around the area for food, maintain security and avoid leaving tracks or other signs. When setting traps and snares, keep them well- camouflaged and in areas where people are not likely to discover them. Remember, the local population sometimes heavily travels trails near water sources.
  4. • Getting water from sources within the hide area. Be careful not to leave tracks of signs along the banks of water sources when getting water. Moving on hard rocks or logs along the banks to get water will reduce the signs you leave.
  5. • Setting clandestine fishing devices, such as stakeouts, below the surface of the water to avoid detection.
  6. • Locating a fire site well away from the hide site. Use this site to prepare food or boil water. Camouflage and sterilize the fire site after each use. Be careful that smoke and light from the fire does not compromise the hole-up area.
561. While in the hole-up area, security is still your primary concern. How should security be structures in a hide site?
1. To limit movement around the area, you may have a two-man team perform more than one task. For example, the team getting water could also set the fishing devices. Do not occupy the hole- up area longer than 72 hours.
562. What is the most crucial component of returning to friendly control?
563. What important considerations to make when returning to friendly control?
1. Establishing contact with friendly lines or patrols is the most crucial part of movement and return to friendly control. All your patience, planning, and hardships will be in vain if you do not exercise caution when contacting friendly frontline forces. Friendly patrols have killed personnel operating behind enemy lines because they did not make contact properly. Most of the casualties could have been avoided if caution had been exercised and a few simple procedures followed. The normal tendency is to throw caution to the winds when in sight of friendly forces. You must overcome this tendency and understand that linkup is a very sensitive situation.
564. If you have made your way to a friendly or neutral country, use the following procedures to cross the border and link up with friendly forces on the other side:
1. • Occupy a hide site on the near side of the border and send a team out to reconnoiter the potential crossing site.
  2. • Surveil the crossing site for at least 24 hours, depending on the enemy situation.

3. • Make a sketch of the site, taking note of terrain, obstacles, guard routines and rotations, and any sensor devices or trip wires. Once the recon is complete, the team moves to the hide site, briefs the rest of the team, and plans to cross the border at night.
  4. • After crossing the border, set up a hide site on the far side of the border and try to locate friendly positions. Do not reveal your presence.
  5. • Depending on the size of your movement team, have two men surveil the potential linkup site with friendly forces until satisfied that the personnel are indeed friendly.
  6. • Make contact with the friendly forces during daylight. Personnel chosen to make contact should be unarmed, have no equipment, and have positive identification readily available. The person who actually makes the linkup should be someone who looks least like the enemy.
  7. • During the actual contact, have only one person make the contact. The other person provides the security and observes the linkup area from a safe distance. The observer should be far enough away so that he can warn the rest of the movement team if something goes wrong.
  8. • Wait until the party he is contacting looks in his direction so that he does not surprise the contact.
  9. He stands up from behind cover, with hands overhead and states that he is an American. After
  10. this, he follows any instructions given him. He avoids answering any tactical questions and does
  11. not give any indication that there are other team members.
  12. • Reveal that there are other personnel with him only after verifying his identity and satisfying
  13. himself he has made contact with friendly forces.
565. How can you Linkup at the FEBA/FLOT?
1. If caught between friendly and enemy forces and there is heavy fighting in the area, you may choose to hide and let the friendly lines pass over you. If overrun by friendly forces, you may try to link up from their rear during daylight hours. If overrun by enemy forces, you may move further to the enemy rear, try to move to the forward edge of the battle area (FEBA)/forward line of own troops (FLOT) during a lull in the fighting, or move to another area along the front.
566. The actual linkup will be done as for linkup during a border crossing. The only difference is that you must be more careful on the initial contact. Why is this?
1. Frontline personnel are more likely to shoot first and ask questions later, especially in areas of heavy fighting. You should be near or behind cover before trying to make Contact.
567. If friendly lines are a circular perimeter or an isolated camp, for example, any direction you approach from will be considered enemy territory. You do not have the option of moving behind the lines and trying to link up. This move makes the linkup extremely dangerous. What are your options in such a scenario?



1. One option you have is to place the perimeter under observation and wait for a friendly patrol to move out in your direction, providing a chance for a linkup. You may also occupy a position outside of the perimeter and call out to get the attention of the friendly forces. Ideally, display anything that is white while making contact. If nothing else is available, use any article of clothing. The idea is to draw attention while staying behind cover. Once you have drawn attention to your signal and called out, follow instructions given to you.
568. What are other considerations to make when linking up with friendly patrols?
1. Be constantly on the alert for friendly patrols because these provide a means for return to friendly control. Find a concealed position that allows you maximum visual coverage of the area. Try to memorize every terrain feature so that, if necessary, you can infiltrate friendly positions under the cover of darkness. Remember, trying to infiltrate in darkness is extremely dangerous.
569. What are your options for making contact if you do not want to make contact with combat patrols?
1. Because of the missions of combat and recon patrols and where they are operating, making contact can be dangerous. If you decide not to make contact, you can observe their route and approach friendly lines at about the same location. Such observation will enable you to avoid mines and booby traps. Once you have spotted a patrol, remain in position and, if possible, allow the patrol to move toward you. When the patrol is 25 to 50 meters from your position, signal them and call out a greeting that is clearly and unmistakably of American origin.
570. What can you do if you do not have a white textile to signal a patrol?
1. If you have nothing white, an article of clothing will suffice to draw attention. If the distance is greater than 50 meters, a recon patrol may avoid contact and bypass your position. If the distance is less than 25 meters, a patrol member may react instantly by firing a fatal shot. It is crucial, at the time of contact, that there is enough light for the patrol to identify you as an American. Whatever linkup technique you decide to use, use extreme caution. From the perspective of the friendly patrol or friendly personnel occupying a perimeter, you are hostile until they make positive identification.
571. What are considerations to make when camouflaging yourself?
1. When camouflaging yourself, consider that certain shapes are particular to humans. The enemy will look for these shapes. The shape of a hat, helmet, or black boots can give you away. Even animals know and run from the shape of a human silhouette. Break up your outline by placing small amounts of vegetation from the surrounding area in your uniform, equipment, and headgear. Try to reduce any shine from skin or equipment. Blend in with the surrounding colors and simulate the texture of your surroundings.
572. How are Shape and Outline important factors in camouflage?
1. Change the outline of weapons and equipment by tying vegetation or strips of cloth onto them. Make sure the added camouflage does not hinder the equipment's operation. When hiding, cover yourself and your equipment with

leaves, grass, or other local debris. Conceal any signaling devices you have prepared, but keep them ready for use.

573. How are Color and Texture important factors in camouflage?
1. Each area of the world and each climatic condition (arctic/winter, temperate/jungle, or swamp/desert) has color patterns and textures that are natural for that area. While color is self-explanatory, texture defines the surface characteristics of something when looking at it. For example, surface textures may be smooth, rough, rocky, leafy, or many other possible combinations. Use color and texture together to camouflage yourself effectively. It makes little sense to cover yourself with dead, brown vegetation in the middle of a large grassy field. Similarly, it would be useless to camouflage yourself with green grass in the middle of a desert or rocky area.
574. To hide and camouflage movement in any specific area of the world, you must take on the color and texture of the immediate surroundings. What does this mean?
1. Use natural or man-made materials to camouflage yourself. Camouflage paint, charcoal from burned paper or wood, mud, grass, leaves, strips of cloth or burlap, pine boughs, and camouflaged uniforms are a few examples.
575. What are important considerations for applying personal camouflage?
1. Cover all areas of exposed skin, including face, hands, neck, and ears. Use camouflage paint, charcoal, or mud to camouflage yourself. Cover with a darker color areas that stick out more and catch more light (forehead, nose, cheekbones, chin, and ears). Cover other areas, particularly recessed or shaded areas (around the eyes and under the chin), with lighter colors. Be sure to use an irregular pattern.
576. How does skin oil impact your camouflage?
1. As skin gets oily, it becomes shiny. Equipment with worn off paint is also shiny. Even painted objects, if smooth, may shine. Glass objects such as mirrors, glasses, binoculars, and telescopes shine. You must cover these glass objects when not in use. Anything that shines automatically attracts attention and will give away your location. Whenever possible, wash oily skin and reapply camouflage. Skin oil will wash off camouflage, so reapply it frequently. If you must wear glasses, camouflage them by applying a thin layer of dust to the outside of
  2. the lenses. This layer of dust will reduce the reflection of light. Cover shiny spots on equipment by painting, covering with mud, or wrapping with cloth or tape. Pay particular attention to covering boot eyelets, buckles on equipment, watches and jewelry, zippers, and uniform insignia. Carry a signal mirror in its designed pouch or in a pocket with the mirror portion facing your body.
577. How do shadows impact your use of camouflage?
1. When hiding or traveling, stay in the deepest part of the shadows. The outer edges of the shadows are lighter and the deeper parts are darker. Remember, if you are in an area where there is plenty of vegetation, keep as much vegetation between you and a potential enemy as possible.
578. How does movement impact your camouflage in enemy terrain?

1. Movement, especially fast movement, attracts attention. If at all possible, avoid movement in the presence of an enemy. If capture appears imminent in your present location and you must move, move away slowly, making as little noise as possible. By moving slowly in a survival situation, you decrease the chance of detection and conserve energy that you may need for long-term survival or long-distance evasion. When moving past obstacles, avoid going over them. If you must climb over an obstacle, keep your body level with its top to avoid silhouetting yourself. Do not silhouette yourself against the skyline when crossing hills or ridges. When you are moving, you will have difficulty detecting the movement of others. Stop frequently, listen, and look around slowly to detect signs of hostile movement.
579. What are good protocols to mitigate noise production when moving?
1. Noise attracts attention, especially if there is a sequence of loud noises such as several snapping twigs. If possible, avoid making any noise at all. Slow down your pace as much as necessary to avoid making noise when moving around or away from possible threats. Use background noises to cover the noise of your movement. Sounds of aircraft, trucks, generators, strong winds, and people talking will cover some or all the sounds produced by your movement. Rain will mask a lot of movement noise, but it also reduces your ability to detect potential enemy noise. Take steps about half your normal stride when stalking in the upright position. Such strides help you to maintain your balance. You should be able to stop at any point in that movement and hold that position as long as necessary. Curl the toes up out of the way when stepping down so the outside edge of the ball of the foot touches the ground. Feel for sticks and twigs that may snap when you place your weight on them. If you start to step on one, lift your foot and move it. After making contact with the outside edge of the ball of your foot, roll to the inside ball of your foot, place your heel down, followed by your toes. Then gradually shift your weight forward to the front foot. Lift the back foot to about knee height and start the process over again.
580. How can you mask your scent while evading enemy capture?
1. Whether hunting animals or avoiding the enemy, it is always wise to camouflage the scent associated with humans. Start by washing yourself and your clothes without using soap. This washing method removes soap and body odors. Avoiding strong smelling foods, such as garlic, helps reduce body odors. Do not use tobacco products, candy, gum, or cosmetics. You can use aromatic herbs or plants to wash yourself and your clothing, to rub on your body and clothing, or to chew on to camouflage your breath. Pine needles, mint, or any similar aromatic plant will help camouflage your scent from both animals and humans. Standing in smoke from a fire can help mask your scent from animals. While animals are afraid of fresh smoke from a fire, older smoke scents are normal smells after forest fires and do not scare them.
581. How can you use your sense of smell to aid you while moving in enemy territory?

1. While traveling, use your sense of smell to help you find or avoid humans. Pay attention to smells associated with humans, such as fire, cigarettes, gasoline, oil, soap, and food.
  2. Such smells may alert you to their presence long before you can see or hear them, depending on wind speed and direction. Note the wind's direction and, when possible, approach from or skirt around on the downwind side when nearing humans or animals.
582. When should you crawl when moving through enemy territory? How should you crawl?
1. Crawl on your hands and knees when the vegetation is too low to allow you to walk upright without being seen. Move one limb at a time and be sure to set it down softly, feeling for anything that may snap and make noise. Be careful that your toes and heels do not catch on vegetation.
583. How can you stalk in the prone position?
1. To stalk in the prone position, you do a low, modified push-up on your hands and toes, moving yourself forward slightly, and then lowering yourself again slowly. Avoid dragging and scraping along the ground as this makes excessive noise and leaves large trails for trackers to follow.
584. How should you stalk an animal?
1. Before stalking an animal, select the best route. If the animal is moving, you will need an intercepting route. Pick a route that puts objects between you and the animal to conceal your movement from it. By positioning yourself in this way, you will be able to move faster, until you pass that object. Some objects, such as large rocks and trees, may totally conceal you, and others, such as small bushes and grass, may only partially conceal you. Pick the route that offers the best concealment and requires the least amount of effort.
585. You must give serious consideration to dealing with the local people. What are some things to consider when dealing with them?
1. Do they have a primitive culture?
  2. Are they farmers, fishermen, friendly people, or enemy?
  3. As a survivor, "cross-cultural communication" can vary radically from area to area and from people to people. It may mean interaction with people of an extremely primitive culture or contact with people who have a relatively modern culture. A culture is identified by standards of behavior that its members consider proper and acceptable but may or may not conform to your idea of what is proper. No matter who these people are, you can expect they will have laws, social and economic values, and political and religious beliefs that may be radically different from yours.
586. How can you plan to deal with civilians in your operating environment?
1. Before deploying into your area of operations, study these different cultural aspects. Prior study and preparation will help you make or avoid contact if you have to deal with the local population. People will be friendly, unfriendly, or they will choose to ignore you. Their attitude may be unknown. If the people are known to be friendly, try to keep them friendly through your courtesy and respect

for their religion, politics, social customs, habits, and all other aspects of their culture. If the people are known to be enemies or are unknowns, make every effort to avoid any contact and leave no sign of your presence. A basic knowledge of the daily habits of the local people will be essential in this attempt. If after careful observation you determine that an unknown people are friendly, you may contact them if you absolutely need their help. Usually, you have little to fear and much to gain from cautious and respectful contact with local people of

2. friendly or neutral countries. If you become familiar with the local customs, display common decency, and most important, show respect for their customs, you should be able to avoid trouble and possibly gain needed help. To make contact, wait until only one person is near and, if possible, let that person make the initial approach.
587. What are some other considerations to make when interacting with civilians?
1. Most people will be willing to help a survivor who appears to be in need. However,
  2. local political attitudes, instruction, or propaganda efforts may change the attitudes of otherwise friendly people. Conversely, in unfriendly countries, many people, especially in remote areas, may feel animosity toward their politicians and may be more friendly toward a survivor. The key to successful contact with local peoples is to be friendly, courteous, and patient. Displaying fear, showing weapons, and making sudden or threatening movements can cause a local person to fear you. Such actions can prompt a hostile response. When attempting a contact, smile as often as you can. Many local peoples are shy and seem unapproachable, or they may ignore you. Approach them slowly and do not rush your contact. Use salt, tobacco, silver money, and similar items discreetly when trading with local people. Paper money is well-known worldwide. Do not overpay; it may lead to embarrassment and even danger. Always treat people with respect. Do not bully them or laugh at them. Using sign language or acting out needs or questions can be very effective. Many people are used to such language and communicate using nonverbal sign language. Try to learn a few words and phrases of the local language in and around your potential area of operations. Trying to speak someone's language is one of the best ways to show respect for his culture. Since English is widely used, some of the local people may understand a few words of English.
588. What are some examples of areas to steer clear from?
1. Some areas may be taboo. They range from religious or sacred places to diseased or danger areas. In some areas, certain animals must not be killed. Learn the rules and follow them. Watch and learn as much as possible. Such actions will help to strengthen relations and provide new knowledge and skills that may be very important later. Seek advice on local hazards and find out from friendly people where the hostile people are. Always remember that people frequently insist that other peoples are hostile, simply because they do not understand different cultures and distant peoples. The people they can usually trust are their immediate neighbors--much the same as in our own neighborhood.

589. What are some of the dangers of interacting with civilians?
1. Frequently, local people, like ourselves, will suffer from contagious diseases. Build a separate shelter, if possible, and avoid physical contact without giving the impression of doing so. Personally prepare your food and drink, if you can do so without giving offense. Frequently, the local people will accept the use of "personal or religious custom" as an explanation for isolationist behavior. Barter, or trading, is common in more primitive societies. Hard coin is usually good, whether for its exchange value or as jewelry or trinkets. In isolated areas, matches, tobacco, salt, razor blades, empty containers, or cloth may be worth more than any form of money. Be very cautious when touching people. Many people consider "touching" taboo and such actions may be dangerous. Avoid sexual contact. Hospitality among some people is such a strong cultural trait that they may seriously reduce their own supplies to feed a stranger. Accept what they offer and share it equally with all present. Eat in the same way they eat and, most important, try to eat all they offer. If you make any promises, keep them. Respect personal property and local customs and manners, even if they seem odd. Make some kind of payment for food, supplies, and so forth. Respect privacy. Do not enter a house unless invited.
590. What are the effects of nuclear weapons?
1. The effects of nuclear weapons are classified as either initial or residual. Initial effects occur in the immediate area of the explosion and are hazardous in the first minute after the explosion. Residual effects can last for days or years and cause death. The principal initial effects are blast and radiation.
591. What are the characteristics of a nuclear blast?
1. Defined as the brief and rapid movement of air away from the explosion's center and the pressure accompanying this movement. Strong winds accompany the blast. Blast hurls debris and personnel, collapses lungs, ruptures eardrums, collapses structures and positions, and causes immediate death or injury with its crushing effect.
592. What are the characteristics of Thermal Radiation?
1. The heat and light radiation a nuclear explosion's fireball emits. Light radiation consists of both visible light and ultraviolet and infrared light. Thermal radiation produces extensive fires, skin burns, and flash blindness.
593. What are the characteristics of Nuclear Radiation?
1. Nuclear radiation breaks down into two categories-initial radiation and residual radiation.
  2. Initial nuclear radiation consists of intense gamma rays and neutrons produced during the first minute after the explosion. This radiation causes extensive damage to cells throughout the body. Radiation damage may cause headaches, nausea, vomiting, diarrhea, and even death, depending on the radiation dose received. The major problem in protecting yourself against the initial radiation's effects is that you may have received a lethal or incapacitating dose before taking any protective action. Personnel exposed to lethal amounts of initial radiation may well have been killed or fatally injured by blast or

3. thermal radiation. Residual radiation consists of all radiation produced after one minute from the explosion. It has more effect on you than initial radiation. A discussion of residual radiation takes place in a subsequent paragraph.
594. What are the characteristics of blast and projectile injuries caused by nuclear weapons?
1. Blast injuries produced by nuclear weapons are similar to those caused by conventional high-explosive weapons. Blast overpressure can produce collapsed lungs and ruptured internal organs. Projectile wounds occur as the explosion's force hurls debris at you. Large pieces of debris striking you will cause fractured limbs or massive internal injuries. Blast over-pressure may throw you long distances, and you will suffer severe injury upon impact with the ground or other objects. Substantial cover and distance from the explosion are the best protection against blast injury. Cover blast injury wounds as soon as possible to prevent the entry of radioactive dust particles.
595. What are the characteristics of thermal injuries caused by nuclear weapons?
1. The heat and light the nuclear fireball emits causes thermal injuries. First-, second-, or third-degree burns may result. Flash blindness also occurs. This blindness may be permanent or temporary depending on the degree of exposure of the eyes. Substantial cover and distance from the explosion can prevent thermal injuries. Clothing will provide significant protection against thermal injuries. Cover as much exposed skin as possible before a nuclear explosion. First aid for thermal injuries is the same as first aid for burns. Cover open burns (second-or third-degree) to prevent the entry of radioactive particles. Wash all burns before covering.
596. What are radiation injuries caused by nuclear weapons?
1. Neutrons, gamma radiation, alpha radiation, and beta radiation cause radiation injuries. Neutrons are high-speed, extremely penetrating particles that actually smash cells within your body. Gamma radiation is similar to X rays and is also a highly penetrating radiation.
  2. During the initial fireball stage of a nuclear detonation, initial gamma radiation and neutrons are the most serious threat. Beta and alpha radiation are radioactive particles normally associated with radioactive dust from fallout. They are short-range particles and you can easily protect yourself against them if you take precautions. See Bodily Reactions to Radiation, below, for the symptoms of radiation injuries.
597. What is Residual Radiation?
1. Residual radiation is all radiation emitted after 1 minute from the instant of the nuclear explosion. Residual radiation consists of induced radiation and fallout.
598. What is Induced Radiation?
1. It describes a relatively small, intensely radioactive area directly underneath the nuclear weapon's fireball. The irradiated earth in this area will remain highly radioactive for an extremely long time. You should not travel into an area of induced radiation.
599. What is fallout?

1. Fallout consists of radioactive soil and water particles, as well as weapon fragments. During a surface detonation, or if an airburst's nuclear fireball touches the ground, large amounts of soil and water are vaporized along with the bomb's fragments, and forced upward to altitudes of 25,000 meters or more. When these vaporized contents cool, they can form more than 200 different radioactive products. The vaporized bomb contents condense into tiny radioactive particles that the wind carries and they fall back to earth as radioactive dust. Fallout particles emit alpha, beta, and gamma radiation. Alpha and beta radiation are relatively easy to counteract, and residual gamma radiation is much less intense than the gamma radiation emitted during the first minute after the explosion. Fallout is your most significant radiation hazard, provided you have not received a lethal radiation dose from the initial radiation.
600. How does radiation affect your body?
1. The effects of radiation on the human body can be broadly classed as either chronic or acute. Chronic effects are those that occur some years after exposure to radiation. Examples are cancer and genetic defects. Chronic effects are of minor concern insofar as they affect your immediate survival in a radioactive environment. On the other hand, acute effects are of primary importance to your survival. Some acute effects occur within hours after exposure to radiation. These effects result from the radiation's direct physical damage to tissue. Radiation sickness and beta burns are examples of acute effects. Radiation sickness symptoms include nausea, diarrhea, vomiting, fatigue, weakness, and loss of hair. Penetrating beta rays cause radiation burns; the wounds are similar to fire burns.
601. How well can the human body recover from radiation damage?
1. The extent of body damage depends mainly on the part of the body exposed to radiation and how long it was exposed, as well as its ability to recover. The brain and kidneys have little recovery capability. Other parts (skin and bone marrow) have a great ability to recover from damage. Usually, a dose of 600 centigrays (cgys) to the entire body will result in almost certain death. If only your hands received this same dose, your overall health would not suffer much, although your hands would suffer severe damage. An external or an internal hazard can cause body damage. Highly penetrating gamma radiation or the less penetrating beta radiation that causes burns can cause external damage. The entry of alpha or beta radiation-emitting particles into the body can cause internal damage. The external hazard produces overall irradiation and beta burns. The internal hazard results in irradiation of critical organs such as the gastrointestinal tract, thyroid gland, and bone. A very small amount of radioactive material can cause extreme damage to these and other internal organs. The internal hazard can enter the body either through consumption of contaminated water or food or by absorption through cuts or abrasions. Material that enters the body through breathing presents only a minor hazard. You can greatly reduce the internal radiation hazard by using good personal hygiene and carefully decontaminating your food and water.



602. What are the symptoms of radiation injuries?
1. The symptoms of radiation injuries include nausea, diarrhea, and vomiting. The severity of these symptoms is due to the extreme sensitivity of the gastrointestinal tract to radiation. The severity of the symptoms and the speed of onset after exposure are good indicators of the degree of radiation damage. The gastrointestinal damage can come from either the external or the internal radiation hazard.
603. What are some countermeasures against penetrating external radiation?
1. The means you can use to protect yourself from penetrating external radiation are time, distance, and shielding. You can reduce the level of radiation and help increase your chance of survival by controlling the duration of exposure. You can also get as far away from the radiation source as possible. Finally you can place some radiation-absorbing or shielding material between you and the radiation.
604. Time is important to you, as the survivor, in two ways. What are they?
1. First, radiation dosages are cumulative. The longer you are exposed to a radioactive source, the greater the dose you will receive. Obviously, spend as little time in a radioactive area as possible. Second, radioactivity decreases or decays over time. This concept is known as radioactive half-life. Thus, a radioactive element decays or loses half of its radioactivity within a certain time. The rule of thumb for radioactivity decay is that it decreases in intensity by a factor of ten for every sevenfold increase in time following the peak radiation level. For example, if a nuclear fallout area had a maximum radiation rate of 200 cgys per hour when fallout is complete, this rate would fall to 20 cgys per hour after 7 hours; it would fall still further to 2 cgys per hour after 49 hours. Even an untrained observer can see that the greatest hazard from fallout occurs immediately after detonation, and that the hazard decreases quickly over a relatively short time. As a survivor, try to avoid fallout areas until the radioactivity decays to safe levels. If you can avoid fallout areas long enough for most of the radioactivity to decay, you enhance your chance of survival.
605. How does distance impact radiation intensity?
1. Distance provides very effective protection against penetrating gamma radiation because radiation intensity decreases by the square of the distance from the source. For example, if exposed to 1,000 cgys of radiation standing 30 centimeters from the source, at 60 centimeters, you would only receive 250 cgys. Thus, when you double the distance, radiation decreases to  $(0.5)^2$  or 0.25 the amount. While this formula is valid for concentrated sources of radiation in small areas, it becomes more complicated for large areas of radiation such as fallout areas.
606. What is the most important method of protection from penetrating radiation?
1. Shielding is the most important method of protection from penetrating radiation. Of the three countermeasures against penetrating radiation, shielding provides the greatest protection and is the easiest to use under survival conditions. Therefore, it is the most desirable method. If shielding is not possible, use the other two methods to the maximum extent practical. Shielding actually works by

absorbing or weakening the penetrating radiation, thereby reducing the amount of radiation reaching your body. The denser the material, the better the shielding effect. Lead, iron, concrete, and water are good examples of shielding materials.

607. How does the presence of fallout impact medical procedures?
1. The presence of fallout material in your area requires slight changes in first aid procedures. You must cover all wounds to prevent contamination and the entry of radioactive particles. You must first wash burns of beta radiation, then treat them as ordinary burns. Take extra measures to prevent infection. Your body will be extremely sensitive to infections due to changes in your blood chemistry. Pay close attention to the prevention of colds or respiratory infections. Rigorously practice personal hygiene to prevent infections. Cover your eyes with improvised goggles to prevent the entry of particles.
608. How thick should a fallout shelter be?
1. The thickness required to weaken gamma radiation from fallout is far less than that needed to shield against initial gamma radiation. Fallout radiation has less energy than a nuclear detonation's initial radiation. For fallout radiation, a relatively small amount of shielding material can provide adequate protection. Figure 23-1 gives an idea of the thickness of various materials needed to reduce residual gamma radiation transmission by 50 percent. The principle of half-value layer thickness is useful in understanding the absorption of gamma radiation by various materials. According to this principle, if 5 centimeters of brick reduce the gamma radiation level by one-half, adding another 5 centimeters of brick (another half-value layer) will reduce the intensity by another half, namely, to one-fourth the original amount. Fifteen centimeters will reduce gamma radiation fallout levels to one-eighth its original amount, 20 centimeters to one-sixteenth, and so on. Thus, a shelter protected by 1 meter of dirt would reduce a radiation intensity of 1,000 cgy per hour on the outside to about 0.5 cgy per hour inside the shelter.
609. What are examples of natural shelters that may help against fallout and radiation?
1. Terrain that provides natural shielding and easy shelter construction is the ideal location for an emergency shelter. Good examples are ditches, ravines, rocky outcroppings, hills, and river banks. In level areas without natural protection, dig a fighting position or slit trench.
610. How should Trenches be built to protect from fallout?
1. When digging a trench, work from inside the trench as soon as it is large enough to cover part of your body thereby not exposing all your body to radiation. In open country, try to dig the trench from a prone position, stacking the dirt carefully and evenly around the trench. On level ground, pile the dirt around your body for additional shielding. Depending upon soil conditions, shelter construction time will vary from a few minutes to a few hours. If you dig as quickly as possible, you will reduce the dosage you receive.
611. While an underground shelter covered by 1 meter or more of earth provides the best protection against fallout radiation, the following unoccupied structures (in order listed) offer the next best protection:

1. • Caves and tunnels covered by more than 1 meter of earth.
  2. • Storm or storage cellars.
  3. • Culverts.
  4. • Basements or cellars of abandoned buildings.
  5. • Abandoned buildings made of stone or mud.
612. Is it a good practice to put a roof on your shelter?
1. It is not mandatory that you build a roof on your shelter. Build one only if the materials are readily available with only a brief exposure to outside contamination. If building a roof would require extended exposure to penetrating radiation, it would be wiser to leave the shelter roofless. A roof's sole function is to reduce radiation from the fallout source to your body. Unless you use a thick roof, a roof provides very little shielding. You can construct a simple roof from a poncho anchored down with dirt, rocks, or other refuse from your shelter. You can remove large particles of dirt and debris from the top of the poncho by beating it off from the inside at frequent intervals. This cover will not offer shielding from the radioactive particles deposited
  2. on the surface, but it will increase the distance from the fallout source and keep the shelter area from further contamination.
613. To reduce your exposure time and thereby reduce the dosage received, remember the following factors when selecting and setting up a shelter:
1. • Where possible, seek a crude, existing shelter that you can improve. If none is available, dig a trench.
  2. • Dig the shelter deep enough to get good protection, then enlarge it as required for comfort.
  3. • Cover the top of the fighting position or trench with any readily available material and a thick layer of earth, if you can do so without leaving the shelter. While a roof and camouflage are both desirable, it is probably safer to do without them than to expose yourself to radiation outside your fighting position.
  4. • While building your shelter, keep all parts of your body covered with clothing to protect it against beta burns.
614. The following timetable provides you with the information needed to avoid receiving serious dosage and still let you cope with survival problems:
1. • Complete isolation from 4 to 6 days following delivery of the last weapon.
  2. • A very brief exposure to procure water on the third day is permissible, but exposure should not exceed 30 minutes.
  3. • One exposure of not more than 30 minutes on the seventh day.
  4. • One exposure of not more than 1 hour on the eighth day.
  5. • Exposure of 2 to 4 hours from the ninth day through the twelfth day.
  6. • Normal operation, followed by rest in a protected shelter, from the thirteenth day on.
  7. • In all instances, make your exposures as brief as possible. Consider only mandatory
  8. requirements as valid reasons for exposure. Decontaminate at every stop.
615. How does fallout impact your water procurement?

1. In a fallout-contaminated area, available water sources may be contaminated. If you wait at least 48 hours before drinking any water to allow for radioactive decay to take place and select the safest possible water source, you will greatly reduce the danger of ingesting harmful amounts of radioactivity. Although many factors (wind direction, rainfall, sediment) will influence your choice in selecting water sources, consider the following guidelines.
616. What are the Safest Water Sources?
1. Water from springs, wells, or other underground sources that undergo natural filtration will be your safest source. Any water found in the pipes or containers of abandoned houses or stores will also be free from radioactive particles. This water will be safe to drink, although you will have to take precautions against bacteria in the water. Snow taken from 15 or more centimeters below the surface during the fallout is also a safe source of water. Water from streams and rivers will be relatively free from fallout within several days after the last nuclear explosion because of dilution. If at all possible, filter such water before drinking to get rid of radioactive particles. The best filtration method is to dig sediment holes or seepage basins along the side of a water source. The water will seep laterally into the hole through the intervening soil that acts as a filtering agent and removes the contaminated fallout particles that settled on the original body of water. This method can remove up to 99 percent of the radioactivity in water. You must cover the hole in some way in order to prevent further contamination. See Figure 6-9 for an example of a water filter.
617. How can you procure water in contaminated area?
1. Water from lakes, pools, ponds, and other standing sources is likely to be heavily contaminated, though most of the heavier, long-lived radioactive isotopes will settle to the bottom. Use the settling technique to purify this water. First, fill a bucket or other deep container three-fourths full with contaminated water. Then take dirt from a depth of 10 or more centimeters below the ground surface and stir it into the water. Use about 2.5 centimeters of dirt for every 10 centimeters of water. Stir the water until you see most dirt particles suspended in the water. Let the mixture settle for at least 6 hours. The settling dirt particles will carry most of the suspended fallout particles to the bottom and cover them. You can then dip out the clear water. Purify this water using a filtration device.
618. How can you procure food in contaminated areas?
1. Although it is a serious problem to obtain edible food in a radiation-contaminated area, it is not impossible to solve. You need to follow a few special procedures in selecting and preparing rations and local foods for use. Since secure packaging protects your combat rations, they will be perfectly safe for use. Supplement your rations with any food you can find on trips outside your shelter. Most processed foods you may find in abandoned buildings are safe for use after decontaminating them. These include canned and packaged foods after removing the containers or wrappers or washing them free of fallout particles. These processed foods also include food stored in any closed container and food stored in protected areas (such as cellars), if you wash them before eating. Wash

all food containers or wrappers before handling them to prevent further contamination. If little or no processed food is available in your area, you may have to supplement your diet with local food sources. Local food sources are animals and plants.

619. Can you get food from animals in contaminated areas? How can you get food from animals in contaminated areas?
1. Assume that all animals, regardless of their habitat or living conditions, were exposed to radiation. The effects of radiation on animals are similar to those on humans. Thus, most of the wild animals living in a fallout area are likely to become sick or die from radiation during the first month after the nuclear Explosion. Even though animals may not be free from harmful radioactive materials, you can and must use them in survival conditions as a food source if other foods are not available. With careful preparation and by following several important principles, animals can be safe food sources. First, do not eat an animal that appears to be sick. It may have developed a bacterial infection as a result of radiation poisoning. Contaminated meat, even if thoroughly cooked, could cause severe illness or death if eaten.
620. All eggs, even if laid during the period of fallout, will be safe to eat. Is milk safe to consume near areas of fallout?
1. Completely avoid milk from any animals in a fallout area because animals absorb large amounts of radioactivity from the plants they eat.
621. How does plant contamination occur? How does this impact your selection of plant food?
1. Plant contamination occurs by the accumulation of fallout on their outer surfaces or by absorption of radioactive elements through their roots. Your first choice of plant food should be vegetables such as potatoes, turnips, carrots, and other plants whose edible portion grows underground. These are the safest to eat once you scrub them and remove their skins. Second in order of preference are those plants with edible parts that you can decontaminate by washing and peeling their outer surfaces. Examples are bananas, apples, tomatoes, prickly pears, and other such fruits and vegetables.
622. What are Biological Agents? What do they cause? How are they Categorized? What are Pathogens? What are toxins and what are the toxins used in biological warfare?
1. Pathogens are living microorganisms that cause lethal or incapacitating diseases. Bacteria, rickettsiae, fungi, and viruses are included in the pathogens. Toxins are poisons that plants, animals, or microorganisms produce naturally. Possible biological war-fare toxins include a variety of neurotoxic (affecting the central nervous system) and cytotoxic (causing cell death) compounds.
623. What are germs? What threat do germs pose to you? How do germs affect the body?
1. Germs are living organisms. Some nations have used them in the past as weapons. Only a few germs can start an infection, especially if inhaled into the lungs. Because germs are so small and weigh so little, the wind can spread them

over great distances; they can also enter unfiltered or nonairtight places. Buildings and bunkers can trap them thus causing a higher concentration.

2. Germs do not affect the body immediately. They must multiply inside the body and overcome the body's defenses--a process called the incubation period. Incubation periods vary from several hours to several months, depending on the germ. Most germs must live within another living organism (host), such as your body, to survive and grow. Weather conditions such as wind, rain, cold, and sunlight rapidly kill germs.
624. Can germs form protective shells to increase duration of survival? How long can most germs survive without a host?
1. Some germs can form protective shells, or spores, to allow survival outside the host. Spore-producing agents are a long-term hazard you must neutralize by decontaminating infected areas or personnel. Fortunately, most live agents are not spore-producing.
  2. These agents must find a host within roughly a day of their delivery or they die. Germs have three basic routes of entry into your body: through the respiratory tract, through a break in the skin, and through the digestive tract. Symptoms of infection vary according to the disease.
625. What are toxins? What effects do toxins have on the body?
1. Toxins are substances that plants, animals, or germs produce naturally. These toxins are what actually harm man, not bacteria. Botulin, which produces botulism, is an example. Modern science has allowed large-scale production of these toxins without the use of the germ that produces the toxin.
  2. Toxins may produce effects similar to those of chemical agents. Toxic victims may not, however, respond to first aid measures used against chemical agents. Toxins enter the body in the same manner as germs. However, some toxins, unlike germs, can penetrate unbroken skin. Symptoms appear almost immediately, since there is no incubation period. Many toxins are extremely lethal, even in very small doses.
  3. Symptoms of exposure to toxins may include any of the following:
    - Dizziness.
    - Mental confusion.
    - Blurred or double vision.
    - Numbness or tingling of skin.
    - Paralysis.
    - Convulsions.
    - Rashes or blisters.
    - Coughing.
    - Fever.
    - Aching muscles.
    - Tiredness.
    - Nausea, vomiting, and/or diarrhea.
    - Bleeding from body openings.
    - Blood in urine, stool, or saliva.
    - Shock.

18. • Death.

626. Your best chance of detecting biological agents before they can affect you is to recognize their means of delivery. What are the three means of delivery of biological agents?
1. • Bursting-type munitions. These may be bombs or projectiles whose burst causes very little damage. The burst will produce a small cloud of liquid or powder in the immediate impact area. This cloud will disperse eventually; the rate of dispersion depends on terrain and weather conditions.
  2. • Spray tanks or generators. Aircraft or vehicle spray tanks or ground-level aerosol generators produce an aerosol cloud of biological agents.
  3. • Vectors. Insects such as mosquitoes, fleas, lice, and ticks deliver pathogens. Large infestations of these insects may indicate the use of biological agents.
627. How do weather patterns like sunlight, wind, and precipitation impact the effects of Chemical and Biological agents?
1. Sunlight contains visible and ultraviolet solar radiation that rapidly kills most germs used as biological agents. However, natural or man-made cover may protect some agents from sunlight. Other man-made mutant strains of germs may be resistant to sunlight.
  2. High wind speeds increase the dispersion of biological agents, dilute their concentration, and dehydrate them. The further downwind the agent travels, the less effective it becomes due to dilution and death of the pathogens. However, the downwind hazard area of the biological agent is significant and you cannot ignore it.
  3. Precipitation in the form of moderate to heavy rain tends to wash biological agents out of the air, reducing downwind hazard areas. However, the agents may still be very effective where they were deposited on the ground.
628. While you must maintain a healthy respect for biological agents, there is no reason for you to panic. You can reduce your susceptibility to biological agents by maintaining current immunizations, avoiding contaminated areas, and controlling rodents and pests. What are some other guidelines for dealing with biological agents?
1. You must also use proper first aid measures in the treatment of wounds and only safe or properly decontaminated sources of food and water. You must ensure that you get enough sleep to prevent a run-down condition. You must always use proper field sanitation procedures.
629. You can build expedient shelters under biological contamination conditions using the same techniques described in Chapter 5. However, you must make slight changes to reduce the chance of biological contamination. What are some of these changes?
1. Do not build your shelter in depressions in the ground. Aerosol sprays tend to concentrate in these depressions.
  2. Avoid building your shelter in areas of vegetation, as vegetation provides shade and some degree of protection to biological agents. Avoid using vegetation in constructing your shelter. Place your shelter's entrance at a 90-degree angle to the prevailing winds. Such placement will limit the entry of airborne agents and prevent air stagnation in your shelter. Always keep your shelter clean.

630. As a survivor, always use the following general steps, in the order listed, to protect yourself from a chemical attack:
1. • Use protective equipment.
  2. • Give quick and correct self-aid when contaminated.
  3. • Avoid areas where chemical agents exist.
  4. • Decontaminate your equipment and body as soon as possible.
631. What pieces of equipment are key to your survival in an CBRN environment?
1. Your protective mask and overgarment are the key to your survival. Without these, you stand very little chance of survival. You must take care of these items and protect them from damage. You must practice and know correct self-aid procedures before exposure to chemical agents.
  2. The detection of chemical agents and the avoidance of contaminated areas is extremely important to your survival. Use whatever detection kits may be available to help in detection. Since you are in a survival situation, avoid contaminated areas at all costs. You can expect no help should you become contaminated. If you do become contaminated, decontaminate yourself as soon as possible using proper procedures.
632. How do CBRN environments impact your ability to drink water? What are the safest sources of water? Where can you get safe drinking water?
1. Obviously, water in sealed containers is your best and safest source. You must protect this water as much as possible. Be sure to decontaminate the containers before opening.
  2. If you cannot get water in sealed containers, try to get it from a closed source such as underground water pipes. You may use rainwater or snow if there is no evidence of contamination.
  3. Use water from slow- moving streams, if necessary, but always check first for signs of contamination, and always filter the water as described under nuclear conditions.
  4. Signs of water source contamination are foreign odors such as garlic, mustard, geranium, or bitter almonds; oily spots on the surface of the water or nearby; and the presence of dead fish or animals. If these signs are present, do not use the water.
  5. Always boil or purify the water to prevent bacteriological infection.
  6. If water in sealed containers is not available, your next choice, only under emergency conditions, is water from springs. Again, boil the water for at least 10 minutes before drinking. Keep the water covered while boiling to prevent contamination by airborne pathogens.
  7. Your last choice, only in an extreme emergency, is to use standing water. Vectors and germs can survive easily in stagnant water. Boil this water as long as practical to kill all organisms. Filter this water through a cloth to remove the dead vectors. Use water purification tablets in all cases. Whenever possible, try to use water that has been in a sealed container. You can assume that the water inside the sealed container is not contaminated. Wash the water container thoroughly with soap and water or boil it for at least 10 minutes before breaking the seal.



633. How does contamination of food impact your ability to eat in CBRN environments?
1. It is extremely difficult to eat while in a contaminated area. You will have to break the seal on your protective mask to eat. If you eat, find an area in which you can safely unmask. The safest source of food is your sealed combat rations. Food in sealed cans or bottles will also be safe. Decontaminate all sealed food containers before opening, otherwise you will contaminate the food. If you must supplement your combat rations with local plants or animals, do not use plants from contaminated areas or animals that appear to be sick. When handling plants or animals, always use protective gloves and clothing.
634. What should you do if you find yourself in a contaminated area?
1. If you find yourself in a contaminated area, try to move out of the area as fast as possible. Travel crosswind or upwind to reduce the time spent in the downwind hazard area. If you cannot leave the area immediately and have to build a shelter, use normal shelter construction techniques, with a few changes. Build the shelter in a clearing, away from all vegetation.
  2. Remove all topsoil in the area of the shelter to decontaminate the area. Keep the shelter's entrance closed and oriented at a 90-degree angle to the prevailing wind. Do not build a fire using contaminated wood--the smoke will be toxic. Use extreme caution when entering your shelter so that you will not bring contamination inside.