



Outdoor Survival

Program Purpose

The purpose of this program is to introduce students to basic outdoor survival concepts and participate in a small group shelter building exercise.

Length of Program: 1-2 ½ hours

Age: Grades 4th – 12th

Maximum Number of Participants: 20

Objectives:

After completion of all activities, students will be able to:

- Identify the seven basic needs for survival.
- Describe the symptoms and treatment for frostbite and hypothermia.
- Compare and contrast the value of different materials in a survival situation.
- Demonstrate creative and critical thinking in a group shelter building exercise.

Preparation:

Before the class arrives:

- Obtain the “Outdoor Survival” kit from the storage room.
- On the dry erase or chalkboard, draw a winter scene of the road from a bus driver’s viewpoint with a deer ahead.
- Set up chairs in the side-by-side formation of bus seats with an aisle down the middle.

Basic Outline:

- I. Introduction (10 minutes)
- II. The Seven Basic Survival Needs (20 minutes)
- III. Dangers of Cold (10 minutes)
- IV. Dangers of Heat
- V. Interactive Immersion (optional)
- VI. Gilligan’s Island (30 minutes)
- VII. 10 Essentials for a survival kit
- VIII. Shelter/Fire Building (50 minutes)
- IX. Conclusion (10 minutes)

Materials:

- 5 plastic tarps
- 5 foam pads
- 5 – 4” lengths of twine
- 5 coffee cans
- 5 fire building pans
- 5 ziplock bags with matches and tinder
- 5 clipboards with paper and pen attached

Dry erase board & markers (or chalkboard & chalk)

Coffee can survival kit w/ 10 essential items

Interactive Immersion - See Appendix A

Introduction:

What is the purpose of learning to survive outside? Because we humans have a tendency to put ourselves into potentially risky (survival) situations and even though we’re not all campers it is still a good skill to learn. So what is a survival situation? It is a time when you are forced to rely on your own resources to live. It is usually a sudden and unplanned situation where there is little or no outside help and it could happen anywhere. There are usually four reasons why we get into survival situations.

1. Lack of skills – lost and don’t know how to use a compass
2. Weather – can’t control
3. Accidents – illness or injury
4. Under prepared

The Seven Basic Survival Needs:

In any survival situation, the following seven basic needs must be met. Write numbers 1-7 on the board. Given the scenario of a survival situation (real life if possible). Ask the students for suggestions of what they might need to survive in the given scenario. As the students give suggestions, list them on the board in order. Then ask the students how long they think they could survive without each.

1. **PMA** (Positive Mental Attitude, or “don’t lose your head”): The most important thing in any survival situation is not to panic. Your brain is your best tool for inventorying what resources you have and for coming up with a plan to provide for your needs. Panic can lead to making irrational, counterproductive decisions that actually make the situation worse, not better. This is the hardest yet the most important of all survival skills. If you think you will live and try to survive, chances are that you will. If not relaxed, clam, and positive you will not be able to think clearly enough to be able to accomplish the other tasks at hand. “If you think you can or can’t, then you will” Henry Ford. Using the STOP acronym helps you make a plan of attack. Sit-down, Think, Observe, and Plan.
- **How long? 3 seconds.** If your car breaks through the ice on a frozen lake and you panic, you may waste time pounding against the windows when you should be rolling them down. People have saved

themselves by popping the trunk, pulling down the back seats and swimming out.

2. **AIR** (oxygen): Although we take air for granted, in a drowning, choking, or toxic fume situation it becomes critical to maintain an adequate supply of oxygen to the brain.
 - **How Long? 3 minutes.** After that, brain cells begin to die.
3. **SHELTER:** A shelter is used to conserve the heat your body already has. Clothing is considered shelter because it traps a layer of warm air and holds it next to your body. Shelters do NOT add heat. Fires or electric blankets may add heat. Would you be warmer standing outside in winter in swimsuit next to a fire, or in a parka and snowpants with no fire? The best way to keep warm is to keep from losing heat. Exposure is the most common cause of death in the backcountry; hence, it is important that you learn the skills in order to build a good one. In some situations the shelter might be the second thing that is needed most. If you don't have a good shelter whether from the sun or for warmth, it could mean surviving or not. When building a shelter, you want to find a spot that will protect you from wind (usually SW), precipitation or sun, depending on your situation. To build your shelter you should keep these few things in mind.
 - a. Location: protection from weather, natural hazards, dry/well drained area, open southern exposure, entryway facing east, fire safety, plant and animal hazards, abundance of building materials, and comfort.
 - b. Shelter size: small is beautiful where as large is a waste of time and resources, plus more space to heat.
 - c. Conservation: use dead vegetation and try to leave as little impact on the land as possible.
 - d. Insulation: the more the merrier depending on the situation. "Watch the squirrel!"

There are many different types of shelters; the kind you build is up to you and your abilities. Here is one way that can work in all situations. Start by leaning a sapling into the crotch of the tree and then stack sticks at right angles to it for the frame, then pile debris (leaves, needles, grass, ferns) on it. Repeat the frame and debris piles until it is the thickness of your arm length. In the winter snow caves (quinzee) make great shelters. If you can find a large snow bank try to dig a cave with enough space for yourself. If a large snow bank isn't readily available you can make a large pile of snow, which is 6 feet tall and 6 feet in diameter. Then let it settle for at least an hour and a half before you start to dig a cave into it. Remember that both of these take a lot of energy, so start early and work at a moderate pace as not to overexert yourself.

- **How long? 3 hours.** If you are wet and exposed to wind and/or cold temperatures, failure to seek shelter can lead to fatal hypothermia. Keeping you DRY and out of the WIND are the two most important assets of any shelter.
- 4. **WARMTH:** If you are in an extended survival situations that may last for days, shelter alone may not be enough to prevent frostbite and/or hypothermia. Warmth can be added through building a fire or drinking hot liquids. Physical activity of any kind will increase blood flow and raise body temperature. The body heat from a warm person can be used to add heat to a cold person. A fire has many purposes in a survival situation. Not only will it keep you warm but purify water, cook food, and signal to others your presence. When building a fire there are some hints to help with the process.
 - *The smaller, the more efficient* - A small fire is better than a big one. A big fire may make you feel better, but will waste your energy having to gather fuel.
 - A fire needs three main things
 1. *Heat for ignition* - A fire starts with a spark. Tools for getting a spark could be a lighter, matches, or flint and steel. You can also make a bow drill, mouth drill, hand drill, or catch rays of sun in an eyeglass lens to start a fire.
 2. *Fuel* - Dry fuel is very important (see the different classes below).
 3. *Oxygen* - Make sure you don't smother the fire by putting too much wood on the fire at one time.
 - Have a four-foot radius cleared of debris for your fire.
 - Keep a careful watch over the fire. Be aware of wind shifts and other hazards.

When you are gathering wood to make a fire, gather twice as much as you think necessary and there are four types to look for. **Tinder** is a material that will light with just a spark. Dry grasses, nest material of rodents, cattail fluff, down from thistles and milkweed and the fibers of dried plants all make good tinder. Tinder must be totally dry, unless you are using birch bark. Birch bark has oils in it that will catch fire even when wet. **Kindling** is made of tiny slivers or twigs as thick as a pencil. If needed, you can shave slivers off larger pieces of wood to create kindling. Collect more than you think you will need, it burns up quickly. **Intermediate firewood** is thicker and longer than kindling. Pencil size to as big around as your wrist. This is what you will use the most of once your fire gets going. **Bulk firewood** is wood that is bigger than your wrist and too big to break. It is added only after your fire is going strong. Remember when your done to have everything that you used burnt completely, put out completely and Leave No Trace.

- **How long? 3 hours-3 days:** Variable depending upon conditions.
- 5. **REST (sleep):** Any physical activity will burn calories – energy that cannot be used later. Resting will conserve calories so that they may be burned slowly for warmth over time. Before any activity, make sure to weigh the benefits and costs, especially if you have no food give yourself more energy.
- **How long? 1-3 days:** Variable, depending upon conditions. 24 hours without sleep or rest will lead to fuzzy thinking and bad decision making for most people.
- 6. **WATER:** It is possible to survive a full three days without water, but as the body dehydrates it begins to function less efficiently. Water loss can occur through breathing, sweating and evaporation. There is no place in the world you can be guaranteed pure water but there are three ways that you can treat water so it is drinkable. Boil for at least 10 minutes (add 1 min for every 1000 feet in elevation gain), filter, or chemically treat. If your water is not purified then you risk the chance of getting *garridia*, a micro-organism, that causes dysentery and vomiting. Once you treat your water you want to keep in mind the concept of conservation. There are seven good ideas to keep in mind: don't eat anything unless you have some liquid (digestion uses most of your body fluids), travel during cool hours, walk at an easy pace without breaking a sweat, don't drink urine, store water in your stomach by drinking as much of your water as you can as often as possible, and don't try to conserve by not drinking it. The last thing you need to know is how to obtain the water and how much to get. On average you need 2-3 liters of water a day but that can change depending on the situation. Several ways to get that water would be water from rain. Absorbing dew from plants with a cloth, and tapping a vine, plant, or tree. Of course if there were a body of water near by that would be the best recommendation.
- **How long? 3 days:** In winter especially people forget to drink because they are not hot. Drink even BEFORE you are thirsty! Thirst is a warning signal telling you that you are already dehydrated. People tend to get dehydrated more in the winter because they don't feel hot. If snow is the only source of water, melt it first so you do not cool your body temperature by eating snow.
- 7. **FOOD:** In most survival situations, food is not a top priority. However, food helps your body stay warm by adding calories to burn and raising body temperature by activating your metabolism. Food is usually the first thing people think they need when in fact it is the last thing they need. We feel we need food because we are used to eating three meals a day every day but as mentioned before you can go three weeks without food if water is available. When gathering food, there are several things to consider.
 - a. Gather with respect, whether plant or animal, take only what you need.
 - b. Make sure the area where you are collecting is not polluted or contaminated.
 - c. Positive identification is essential! There are many look a likes. Don't eat anything that you aren't sure of.
 - d. Make sure you know what kind of food preparation is needed
 - e. Know what parts of the plant are edible in what season.There are four types of plants that you can be fairly safe eating in all parts of the country. **Grasses:** The roots, shoots, leaves, and seeds are all edible. The young shoots can be eaten raw. They are high in vitamins and minerals. When the grass become more mature, they are harder to digest, so chew them, swallow the juices, and spit out the fibrous parts. Grass seeds are rich in protein. These can be eaten raw, roasted, boiled into a mash or ground into flour. It is suggested that you roast all grass seeds you are not sure of; some are toxic if eaten raw. Seeds that are black or purple may indicate the presence of a toxic fungus so just eat seeds that are green or brown. **Cattails:** In early spring the young shoots (up to two feet tall) can be peeled and eaten raw or boiled. In late spring the green flower heads can be husked and boiled. In the summer the pollen heads can be picked and eaten raw or ground into flour. The root can be eaten in late summer and winter, boiled or raw. **Pine Trees:** All types are edible. The needles can be chopped and steeped in hot water to make a tea that is rich in vitamin C. In spring the male pollen anthers can also be eaten, they are high in protein. The seeds are a tasty treat and very high in protein. **Acorns:** All acorns are edible, even when green. A handful will provide as much nutritional value as a pound of hamburger. White oak and pin oak acorns can be eaten raw, but the rest need to be leached of the bitter tannic acids, done by boiling them in several changes of water. **Insects:** Nearly all insects are edible; just make sure to cook them first to get rid of parasites. Insects contain protein and essential vitamins. They work well added to soups and stews even if you don't have many of them. Grasshoppers, crickets, katydids and cicadas can be gathered from the grasses they cling to. Gather ants by digging into their nest with a small bucket and collecting the ants along with their nesting material. Then roast them and the sugary abdomen. Look in the rivers and streams under rocks for stonefly and mayfly larvae. Caterpillars can also be eaten, but avoid the fuzzy ones, they tend to be poisonous. Grubs, maggots and earthworms are easy to gather and a good source of protein. Put them in a stew or fry them.
- **How long? 3 weeks:** Without food, your body will burn fat reserves as fuel. After fat reserves are used

up, the body will begin to metabolize protein, burning muscle as a food source.

Dangers of Cold:

There are two main winter dangers: hypothermia and frostbite. Hypothermia can be fatal; frostbite can lead to the amputation of body parts. It is critical to understand and be able to recognize and treat both these conditions.

Hypothermia is a drop in the body's core temperature (in the central part of the body). As the body loses heat, it begins to function less and less efficiently. Blood vessels constrict, drawing blood away from the hands and feet toward the heart and lungs.

98.6 ° F : Average normal body temperature

96.0 ° F : Body shivers to generate heat. Chemical reactions slow.

94.0 ° F : Body may shiver uncontrollably. Mental and physical processes are very inefficient; good chance of making dangerous, irrational mistakes.

92.0 ° F : Beyond this body requires added heat to warm itself. Person is mentally and physically incompetent.

90.0 ° F - 85 ° F : All shivering stops. Muscles become rigid. Unconsciousness sets in.

78.0 ° F : Death occurs.

Signs of Hypothermia

Mild Hypothermia (above 90.0 ° F): Look for consistent shivering and blue lips, progressing to slurred speech, dazed expression, and stiff muscles.

Severe Hypothermia (below 90.0 ° F): Shivering has stopped. Person appears confused and unaware; muscles are rigid and unconsciousness sets in.

Treatment of Hypothermia

Reduce heat loss and add heat. Get victim out of the weather and remove wet clothing. Replace it with dry clothing or a sleeping bag. You must get the victim warm. If possible, get to a warm place (inside heated shelter or car). Get several people to huddle around the victim to slowly add heat. If conscious, give victim warm liquids to drink. They should see a doctor as soon as possible.

Frostbite occurs when cells in the body freeze and burst. This most commonly happens to exposed body parts like the cheeks, nose, and ears, and to the extremities, like the hands and feet. What happens to a pop can that you stick in the freezer? It explodes, because as the water inside turns to ice, it expands. The same thing can happen to your skin. If the water inside your cells freezes, it will expand and burst your cells. Frostbite is not usually fatal, but it can kill body parts, turning them black.

Signs of Frostbite

Pain or burning sensation in exposed area. White spot forms surrounded by red skin
Numbness in affected area

Treatment of Frostbite

Slowly and gently warm the affected parts by placing them on someone's stomach, a hand on the exposed part, or putting in lukewarm (not hot) water. If the body parts are numb, the victim should see a doctor.

To prevent cold dangers keep in mind the COLD theory.

C – clean wool clothing

O – over heating

L – layers

D – dry

Dangers of Heat:

Not only does the cold have adverse effects on your body but also heat and dehydration. Heat exhaustion is a mild form of heat related illness, while heat stroke is the severe result of overheating and could possibly lead to death.

Heat Exhaustion is severe exhaustion caused by extreme body heat. Excessive heat and dehydration can cause the body to overreact, thus raising your body temperature to over 102°.

Signs of Heat Exhaustion

Paleness, nausea, extreme fatigue, dizziness, lightheadedness, vomiting, fainting and cool, clammy skin.

Treatment of Heat Exhaustion

Cool, shady environments, liquids, cool rags placed on various areas of the body and replacement of electrolytes (sport drinks) are used to treat this condition. If body temperatures don't drop consult a doctor immediately as possible.

Heat Stroke is a medical emergency, and the most severe form of heat related illness. Anyone exhibiting the signs and symptoms of heat stroke should be rushed to the nearest hospital or clinic. Unlike other forms of heat illness, heat stroke doesn't have to be caused by exercise or exertion. High temperatures, lack of body fluids and overexposure to the elements can all bring about heat stroke.

Signs of Heat Stroke

The first sign to look for is red, flushed skin. People, who are suffering heat stroke, do not sweat, so it is critical that they receive emergency care. Other signs include body temperatures above 103° F, red, hot and dry skin, rapid, strong pulse, throbbing headache, dizziness, nausea, confusion and unconsciousness.

Treatment of Heat Stroke

If you notice any of these conditions have someone call for medical assistance. Until medical assistance gets there get the victim to a shady area. Cool the victim

rapidly using whatever methods you can. These include immersing the victim in a tub of cool water, place in a cool shower, spray with a garden hose or sponge down. If humidity is low, wrap the victim in a cool, wet sheet and fan them vigorously. Monitor body temperature, and continue cooling efforts until the body temperature drops to 101° or 102° F. Do not give the victim any alcoholic beverages. If emergency medical personnel are delayed, call the hospital emergency room for further instructions. Lastly if the victims' muscles begin to twitch uncontrollably as a result of heat stroke keep the victim from injuring themselves and make sure the airway remains open by turning them onto their side.

Gilligan's Island:

Split the students into groups of four and give each group a clipboard, paper and pencil. Give them the following scenario: They have crash-landed on an island that has a climate similar to Wisconsin's in winter. The distance to the mainland is too great to walk and there is no boat. What five items would the group choose to have with them to increase their chances of survival? Tell the students to be specific. Give them about 15 minutes to work within their group. Call the groups back together and one by one have each group write their items on the board, explaining why each was chosen. Encourage the students to question each other's choices. The purpose of this activity is to get them to think critically and creatively and be able to justify their reasons for choosing certain items over others.

Answers may vary greatly; here are a few things to consider:

- Is a tent better than a sleeping bag?
- Is a tent without a waterproof ground cloth effective?
- If matches are chosen, how will they get dry wood?
- Would a knife or axe be more useful?
- Would a signal mirror, CD, or flare gun be useful?
- If blankets or extra clothing is chosen, what material are they made from?

10 Essentials of a Coffee Can Survival Kit:

If a survival situation does occur, there are ten items to always have with you no matter where you are adventuring. These ten items should be able to fit into a coffee can, not that you have to transport them in the can. By being prepared, the goal is to avoid a survival situation from ever occurring. As an old saying goes, "There is no such thing as bad weather, only inappropriate clothing." (Show example can and items as naming and explaining usage).

- Knife (small folding model with a locking blade)
- Lighter or other fire starter (waterproof matches, flint and steel)
- Garbage bag (an emergency shelter, raincoat, or insulation jacket when stuffed with leaves or grass or to carry water)

- Water
- High energy food (non-perishable)
- Map and compass
- Raingear
- Extra warm clothes
- Signaling whistle and mirror
- Small first aid kit

There are other items that could be included will depend on where you will spend most of your time tripping and what you are willing to carry.

Not only having the right survival equipment helps during your trip but also having the right clothing for the weather conditions can save you. Here are some recommendations.

- Layer clothing to adjust to the level of activity and weather conditions – a light synthetic layer such as polypropylene to wick moisture away from the skin, followed by an insulating layer such as a polar fleece jacket and finally a storm shell to keep out the wind and rain.
- Choose the proper fabrics – wool and synthetic fabrics such as polar fleece, nylon and polypropylene are superior to cotton in keeping you warm, even when wet.
- Wear a hat for warmth and to keep the sun, rain and bugs off. An uncovered head will loose 50% of your body heat in 40°F weather.
- Mittens are warmer than gloves; your fingers heat each other.
- Loose clothing provides easier movement and greater warmth.
- Wear sturdy, comfortable, well broken-in boots for support and to avoid blisters.

Fire/Shelter Building:

Break them up into groups, with one adult, in which to practice their survival skills. You may want to pull the adults aside to emphasize that they are there for supervision only, not to participate. Set up a situation (35° F, raining, one hour before sunset, and they are lost in the woods). They need to work together to build a fire, boil water and/or build a shelter (depending on time and seasons). If they can maintain PMA through out the activity, they will survive the situation.

Give each group the materials necessary for their activity and appropriate further instructions.

Fire

- Zip lock bag, fire pan
- Gathered kindling – *down and dead Only!*

Shelter

- A tarp, foam pad, and four feet of twine.
- Emphasize that knocking down trees or logs is strictly forbidden.

- Tell the group that they will have about 40 minutes to build a shelter using just those items and what they find at the site.
- Encourage them to consider the slope of their location, relationship to the wind or sunrays, etc.
- Everyone must be able to fit inside the shelter, and everyone must participate in making it.
- At the end, we will have a “Parade of Homes” where each group can show off their shelter and explain how and why it was constructed to the other groups.

Once they begin, circulate among the groups and ask them about their choice of location for their shelter and the shelter’s entrance. Give suggestions when necessary but let them try ideas on their own and evaluate their success. Watch to make sure the adults don’t take over the activities of the group. After the allotted time gather everyone, and start the “Parade of Homes”. Ask questions like; why this location, reasons for design, are they worried about any elements, if they had more time what would they add.

Conclusion:

After the success of boiling water, students must return zip lock bag to teacher with all items and disperse unused wood. Ask them what methods worked best in building a fire and what things did the fire need in order to start and keep burning? After the parade of homes, students must disassemble their shelters and bring materials back to the classroom. For both activities ask the students: Did they work at a team? Did they have PMA? Remind them that it is not the tools they bring with them but the ability to use what they’ve got. For review have the students list the Seven Basic Survival Needs, and the signs and treatment of hypothermia and frostbite or heat exhaustion and stroke. Emphasize that the most important factors in keeping warm are staying dry, out of the wind, keeping exposed areas and extremities covered, and seeking shelter.

Appendix A

Interactive Water Immersion:

(Fits well before Gilligan’s Island)

Materials

- 2 large containers
 - Ice cubes
 - Several pennies
 - 2 towels
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- Fill one cooler half full with luke-warm water and the other cooler with ice water (use the bag of ice to help accomplish this)
 - Place pennies in the bottom of each cooler
 - Have three students at each cooler attempt to pick up the coins, then switch
 - Have them try with their eyes closed – When able to see, students typically blame their inability to pick up coins on the ice obscuring their view.
 - Make them use just their fingertips
 - Don’t let them use the side of the cooler to aid them
 - Use towels to dry off
 - Students should note that it is more difficult to pick up coins in the ice water rather than in the warm water. This is because ice water constricts blood vessels decreasing the flow of nutrients to the muscles, which causes sense of touch and dexterity to deteriorate. This is showing what happens when you don’t have the proper hand covering.