

Post Visit 1  
Survival  
6-8



## Survival Scenario Games

### Purpose/Objective

Students will be able to list items of importance in a survival situation

### Materials

Supply lists for each group  
Pencils

### Procedure

1. Review with students the three things you need to survive:
  - a. Food
  - b. Water
  - c. Shelter
2. Once those three things are located, what is the most important thing to do?
  - a. Signal for help
3. Place students into groups and read the survival scenario (plane crash or water).
4. Hand out the list of supplies and each group should rank them in order of importance, 1 being the most important. They should also give a reason why they ranked it at that number
5. Have the groups present their ranking, allow time for debate among the groups about their ranking.
6. Share the 'correct' answers with the class.

Scenario 1

### **Lost at Sea Exercise**

#### **Scenario:**

- You and your team have chartered a yacht.
- None of you have any previous sailing experience, and you have hired an experienced skipper and two-person crew.
- As you sail through the Southern Pacific Ocean a fire breaks out and much of the yacht and its contents are destroyed.
- The yacht is slowly sinking.
- Your location is unclear because vital navigational and radio equipment has been damaged.

- The yacht skipper and crew have been lost whilst trying to fight the fire.
- Your best estimate is that you are approximately 1000 miles South West of the nearest landfall.
- You and your friends have managed to save the following 15 items, undamaged and intact after the fire.
  1. A sextant
  2. A shaving mirror
  3. A quantity of mosquito netting
  4. A 5 gallon can of water
  5. A case of army rations
  6. Maps of the Pacific Ocean
  7. A floating seat cushion
  8. A 2 gallon can of oil/petrol mixture
  9. A small transistor radio
  10. 20 square feet of Opaque plastic sheeting
  11. Shark repellent
  12. One quart of 160 per cent proof rum
  13. 15ft nylon rope
  14. 2 boxes of chocolate bars
  15. A fishing kit
- In addition to the above, you have salvaged a four man rubber life craft.
- The total contents of your combined pocket's amounts to a packet of cigarettes, three boxes of matches and 3 \$5 notes.

Answers:

### **Lost at Sea Rationale**

According to the experts (US Coastguard), the basic supplies needed when a person is stranded mid-ocean are articles to attract attention and articles to aid survival until rescue arrives. Articles for navigation are of little importance since even if a small life raft were capable of reaching land, it would be impossible to store enough food and water to survive for the requisite amount of time.

Without signaling devices, there is almost no chance of being spotted and ultimately rescued. Furthermore, most rescues occur within the first 36 hours and a person can survive with only a minimum of food and water during that period.

So, the following is the order of ranking the items in their importance to your survival:

- |                                       |   |
|---------------------------------------|---|
| 1. Shaving Mirror                     | Critical for signaling  |
| 2. 2 gallon can of oil/petrol mixture | Critical for signaling.<br>The mixture will float<br>on water and could |

- |   |  |
|---|--|
|   | be ignited with one of the \$5 bills and a match.  |
|   | <i>What the experts don't say is how you get away from this conflagration or what to do if the wind should push the life raft into the flames!</i> |
| 3. 5 gallon can of water                | Necessary to replenish fluids lost through perspiration ( <i>that's sweat</i> )  |
| 4. One case of army rations             | Basic food intake  |
| 5. 20 square feet of opaque plastic     | Can be utilised to collect rain water and provide shelter from the elements  |
| 6. 2 boxes of chocolate bars            | Reserve food supply ( <i>what were you going to do with that much chocolate?</i> )   |
| 7. Fishing kit                          | Ranked lower than the chocolate as 'a bird in the hand is worth two in the bush' There is no guarantee you will catch any fish.                    |
| 8. 15ft of nylon rope                   | Could be used to lash people or equipment together to prevent it being washed overboard.   |
| 9. Floating seat cushion                | A life preserver if someone fell overboard   |
| 10. Shark repellent                     | Enough said  |
| 11. One quart of 160 per cent proof rum | Contains 80%   |

- alcohol, which is enough to be used as an antiseptic for any injuries, otherwise of little value – would cause dehydration if ingested (*that's drunk to you and me*)
12. Small transistor radio  
Of no use without a transmitter. You would also be out of range of any radio station.
13. Maps of the Pacific Ocean  
Worthless without navigation equipment. It does not matter where you are but **where the rescuers are!**
14. Mosquito netting  
There are **NO** mosquitos in the midpacific ocean. As for fishing with it? – stick to the fishing kit.
15. Sextant  
Useless without the relevant tables and a chronometer.

#### Scenario 2

You and your companions have just survived the crash of a small plane. Both the pilot and co-pilot were killed in the crash. It is mid-January , and you are in Northern Canada. The daily temperature is 25 below zero, and the night time temperature is 40 below zero. There is snow on the ground, and the countryside is wooded with with several creeks criss-crossing the area. The nearest town is 20 miles away. You are all dressed in city clothes appropriate for a business meeting. Your group of survivors managed to salvage the following items:

A ball of steel wool

A small ax  
A loaded .45-caliber pistol  
Can of Crisco shortening  
Newspapers (one per person)  
Cigarette lighter (without fluid)  
Extra shirt and pants for each survivor  
20 x 20 ft. piece of heavy-duty canvas  
A sectional air map made of plastic  
One quart of 100-proof whiskey  
A compass  
Family-size chocolate bars (one per person)

Your task as a group is to list the above 12 items in order of importance for your survival. List the uses for each. You **MUST** come to agreement as a group.

### **EXPLANATION**

Mid-January is the coldest time of year in Northern Canada. The first problem the survivors face is the preservation of body heat and the protection against its loss. This problem can be solved by building a fire, minimizing movement and exertion, using as much insulation as possible, and constructing a shelter.

The participants have just crash-landed. Many individuals tend to overlook the enormous shock reaction this has on the human body, and the deaths of the pilot and co-pilot increases the shock. Decision-making under such circumstances is extremely difficult. Such a situation requires a strong emphasis on the use of reasoning for making decisions and for reducing fear and panic. Shock would be shown in the survivors by feelings of helplessness, loneliness, hopelessness, and fear. These feelings have brought about more fatalities than perhaps any other cause in survival situations. Certainly the state of shock means the movement of the survivors should be at a minimum, and that an attempt to calm them should be made.

Before taking off, a pilot has to file a flight plan which contains vital information such as the course, speed, estimated time of arrival, type of aircraft, and number of passengers. Search-and-rescue operations begin shortly after the failure of a plane to appear at its destination at the estimated time of arrival.

The 20 miles to the nearest town is a long walk under even ideal conditions, particularly if one is not used to walking such distances. In this situation, the

walk is even more difficult due to shock, snow, dress, and water barriers. It would mean almost certain death from freezing and exhaustion. At temperatures of minus 25 to minus 40, the loss of body heat through exertion is a very serious matter.

Once the survivors have found ways to keep warm, their next task is to attract the attention of search planes. Thus, all the items the group has salvaged must be assessed for their value in signaling the group's whereabouts.

The ranking of the survivors items was made by Mark Wanvig, a former instructor in survival training for the Reconnaissance School of the 101st Division of the U.S. Army. Mr. Wanvig currently conducts wilderness survival training programs in the Minneapolis, Minnesota area. This survival simulation game is used in military training classrooms.

## **RANKINGS**

### 1. Cigarette lighter (without fluid)

The gravest danger facing the group is exposure to cold. The greatest need is for a source of warmth and the second greatest need is for signaling devices. This makes building a fire the first order of business. Without matches, something is needed to produce sparks, and even without fluid, a cigarette lighter can do that.

### 2. Ball of steel wool

To make a fire, the survivors need a means of catching the sparks made by the cigarette lighter. This is the best substance for catching a spark and supporting a flame, even if the steel wool is a little wet.

### 3. Extra shirt and pants for each survivor

Besides adding warmth to the body, clothes can also be used for shelter, signaling, bedding, bandages, string (when unraveled), and fuel for the fire.

### 4. Can of Crisco shortening

This has many uses. A mirror-like signaling device can be made from the lid. After shining the lid with steel wool, it will reflect sunlight and generate 5 to 7 million candlepower. This is bright enough to be seen beyond the horizon. While this could be limited somewhat by the trees, a member of the group could climb a tree and use the mirrored lid to signal search planes. If they had no other means of signaling than this, they would have a better than 80%

chance of being rescued within the first day.

There are other uses for this item. It can be rubbed on exposed skin for protection against the cold. When melted into an oil, the shortening is helpful as fuel. When soaked into a piece of cloth, melted shortening will act like a candle. The empty can is useful in melting snow for drinking water. It is much safer to drink warmed water than to eat snow, since warm water will help retain body heat. Water is important because dehydration will affect decision-making. The can is also useful as a cup.

#### 5. 20 x 20 foot piece of canvas

The cold makes shelter necessary, and canvas would protect against wind and snow (canvas is used in making tents). Spread on a frame made of trees, it could be used as a tent or a wind screen. It might also be used as a ground cover to keep the survivors dry. It's shape, when contrasted with the surrounding terrain, makes it a signaling device.

#### 6. Small ax

Survivors need a constant supply of wood in order to maintain the fire. The ax could be used for this as well as for clearing a sheltered campsite, cutting tree branches for ground insulation, and constructing a frame for the canvas tent.

#### 7. Family size chocolate bars (one per person)

Chocolate will provide some food energy. Since it contains mostly carbohydrates, it supplies the energy without making digestive demands on the body.

#### 8. Newspapers (one per person)

These are useful in starting a fire. They can also be used as insulation under clothing when rolled up and placed around a person's arms and legs. A newspaper can also be used as a verbal signaling device when rolled up in a megaphone-shape. It could also provide reading material for recreation.

#### 9. Loaded .45-caliber pistol

The pistol provides a sound-signaling device. (The international distress signal is 3 shots fired in rapid succession). There have been numerous cases of survivors going undetected because they were too weak to make a loud enough noise to attract attention. The butt of the pistol could be used as a hammer, and the powder from the shells will assist in fire building. By placing a small bit of cloth in a cartridge emptied of its bullet, one can start a fire by firing the gun at dry wood on the ground. The pistol also has some serious disadvantages. Anger, frustration, impatience, irritability, and lapses of

rationality may increase as the group awaits rescue. The availability of a lethal weapon is a danger to the group under these conditions. Although a pistol could be used in hunting, it would take an expert marksman to kill an animal with it. Then the animal would have to be transported to the crash site, which could prove difficult to impossible depending on its size.

#### 10. Quart of 100 proof whiskey

The only uses of whiskey are as an aid in fire building and as a fuel for a torch (made by soaking a piece of clothing in the whiskey and attaching it to a tree branch). The empty bottle could be used for storing water. Can also be used as an antiseptic for a wound. The danger of whiskey is that someone might drink it, thinking it would bring warmth. Alcohol takes on the temperature it is exposed to, and a drink of minus 30 degrees Fahrenheit whiskey would freeze a person's esophagus and stomach. Alcohol also dilates the blood vessels in the skin, resulting in chilled blood being carried back to the heart, resulting in a rapid loss of body heat. Thus, a drunk person is more likely to get hypothermia than a sober person is.

#### 11. Compass

Because a compass might encourage someone to try to walk to the nearest town, it is a dangerous item. It's only redeeming feature is that it could be used as a reflector of sunlight (due to its glass top).

#### 12. Sectional air map made of plastic

This is also among the least desirable of the items because it will encourage individuals to try to walk to the nearest town. It's only useful feature is as a ground cover to keep someone dry.

### Scenario 3

Just for fun

You are a member of a space crew originally scheduled to rendezvous with a mother ship on the lighted surface of the moon. However, due to mechanical difficulties, your ship was forced to land at a spot some 200 miles from the rendezvous point. During reentry and landing, much of the equipment aboard was damaged and, since survival depends on reaching the mother ship, the most critical items available must be chosen for the 200-mile trip. Below are listed the 15 items left intact and undamaged after landing. Your task is to rank order them in terms of their importance for your crew in allowing them to reach the rendezvous point. Place the number **1** by the most important item, the number **2**



by the second most important, and so on through number **15** for the least important.

**Your Ranking NASA Ranking**

- \_\_\_\_\_ Box of matches \_\_\_\_\_
- \_\_\_\_\_ Food concentrate \_\_\_\_\_
- \_\_\_\_\_ 50 feet of nylon rope \_\_\_\_\_
- \_\_\_\_\_ Parachute silk \_\_\_\_\_
- \_\_\_\_\_ Portable heating unit \_\_\_\_\_
- \_\_\_\_\_ Two .45 caliber pistols \_\_\_\_\_
- \_\_\_\_\_ One case of dehydrated milk \_\_\_\_\_
- \_\_\_\_\_ Two 100 lb. tanks of oxygen \_\_\_\_\_
- \_\_\_\_\_ Stellar map \_\_\_\_\_
- \_\_\_\_\_ Self-inflating life raft \_\_\_\_\_
- \_\_\_\_\_ Magnetic compass \_\_\_\_\_
- \_\_\_\_\_ 5 gallons of water \_\_\_\_\_
- \_\_\_\_\_ Signal flares \_\_\_\_\_
- \_\_\_\_\_ First aid kit, including injection needle \_\_\_\_\_
- \_\_\_\_\_ Solar-powered FM receiver-transmitter \_\_\_\_\_

**Answers to the Survival on the Moon Exercise**

<b>Item</b>	<b>NASA Ranking</b>	<b>NASA's Reasoning</b>
Box of matches	<b>15</b>	Virtually worthless -- there's no oxygen on the moon to sustain combustion
Food concentrate	<b>4</b>	Efficient means of supplying energy requirements
50 feet of nylon rope	<b>6</b>	Useful in scaling cliffs and tying injured together
Parachute silk	<b>8</b>	Protection from the sun's rays
Portable heating unit	<b>13</b>	Not needed unless on the dark side
Two .45 caliber pistols	<b>11</b>	Possible means of self-propulsion

One case of dehydrated milk	<b>12</b>	Bulkier duplication of food concentrate
Two 100 lb. tanks of oxygen	<b>1</b>	Most pressing survival need (weight is not a factor since gravity is one-sixth of the Earth's -- each tank would weigh only about 17 lbs. on the moon)
Stellar map	<b>3</b>	Primary means of navigation - star patterns appear essentially identical on the moon as on Earth
Self-inflating life raft	<b>9</b>	bottle in military raft may be used for propulsion
Magnetic compass	<b>14</b>	The magnetic field on the moon is not polarized, so it's worthless for navigation
5 gallons of water	<b>2</b>	Needed for replacement of tremendous liquid loss on the light side
Signal flares	<b>10</b>	Use as distress signal when the mother ship is sighted
First aid kit, including injection needle	<b>7</b>	Needles connected to vials of vitamins, medicines, etc. will fit special aperture in NASA space suit
Solar-powered FM receiver-transmitter	<b>5</b>	For communication with mother ship (but FM requires line-of-sight transmission and can only be used over short ranges)

[://wilderdom.com/games/descriptions/SurvivalScenarios.](http://wilderdom.com/games/descriptions/SurvivalScenarios)

1.

Post Visit 2  
Survival  
6-8



## Solar Still

### Purpose/Objective

Students will be able to calculate the amount of water gathered in a solar still in one school day.

### Materials

Shovels or digging tools

Large piece of clear plastic tarp

Plastic tupper ware container or cup

Large open, sunny area where you will have permission to dig

Flagging tape to mark the area so no one disturbs it.

Yard sticks or measuring tape

Graduated cylinder

### Procedure

1. As the students to describe in a drawing or in writing how the solar still works. This should include the words evaporation and condensation.
2. Take the students out to the area that you have permission to dig.
3. Break the kids up into teams depending on how much space and materials you have.
4. Have each group dig a hole. They can all be the same dimensions (ei 1ft wide by 1ft deep) and you can compare the amount of water collected from different soil types. Or, each hole can be a different size (ie 1 ft wide, 1 ft deep, and 1 ft wide 2 ft deep, and 2 ft wide, 1 ft deep) to compare the amount of water collected by dimensions.
5. Dig the holes and have the students build the solar stills like they did at Crystal Springs Preserve, tupper ware or cup at the bottom to collect the water, plastic stretched across the top and sealed at the edges with dirt, one small rock or weight in the center of the plastic over the water collecting cup.
6. Leave the stills alone for a full day if possible.
7. Carefully remove the plastic cover, make observations about condensation on the plastic that did not drip into the cup.
8. Measure the amount of water collected in the cups/tupper ware using the graduated cylinder.
9. Make a chart to compare hole size to amount of water collected or soil type to amount of water collected.

10. What conclusion can you draw from your data?

Post Visit 3  
Survival  
6-8



## O is for Observe

### Purpose/Objective

Student will be able to identify plants on their campus and any survival uses that they may have and any dangers they may pose

### Materials

Florida plant field guides

Digital camera and/or permission to collect and press plant samples

Paper and printer for making brochure to share

### Procedure

1. Discuss the hierarchy of needs in a survival situation: shelter, then water, lastly food.
2. Make a list on the board/overhead of plants that are common in your area that are edible and ones that are poisonous
3. Make a third list of plants that the class knows but does not know if they are edible or poisonous
4. Take a tour of your campus
5. Have students collect pictures or plants that they find or samples of the plants if you have permission
6. Back in the classroom, use field guides and websites to identify the plants that they have collected.
7. List any benefits or harmful parts of the plants.
8. Have students make brochures about the plants found on your campus

[://www.equipped.org/21-76/ch9.](http://www.equipped.org/21-76/ch9)

## Post Visit 4 Survival

3-5



### Measurements

#### Purpose/Objective

To teach children a method of measurement, without any instruments, in order to assist them during a survival situation.

#### Materials

Measuring tape

#### Procedure

1. Begin by measuring out 10 feet on the ground with a measuring tape and marking it on the ground.
2. Have the kids pace out the 10 feet counting how many steps it takes to reach the 10-foot mark.
3. The number of steps it takes for each child to reach the mark is considered to be a length and each length is equal to 10 feet.
4. Have the children measure lengths to different places around the campus and compare results with the others.

Pre Visit 2  
Survival  
6-8



## Water Cycle

### Purpose/Objective

Students will be able to define evaporation, transpiration, condensation, and precipitation in relation to the water cycle.

### Materials

large hand mirror  
freezer or ice cubes  
pot holder  
kettle or pot  
water

### Procedure

1. Place 'Water Cycle' on the board or over head.
2. Do a 'think pair share' to come up with an explanation for or a definition of 'Water Cycle'.
3. If students have not used the terms Evaporation, Transpiration, Precipitation, and/or Condensation, define them and add them into the working explanation of the water cycle.
4. In lab groups or as a class experiment do the following:
  1. Put the mirror in the freezer, or place ice cubes on it to make it really cold.
  2. Place water in a kettle on the stove, and bring it to a boil.
  3. When the water is boiling, hold the mirror so that the steam (water vapor) is hitting it. Use a pot holder or glove to protect your hand. Steam or hot water vapor can burn your skin. Ask an adult for help using the stove and holding the mirror.
5. Have students draw a picture of the kettle, stove, mirror set up and label where the water evaporated, condensed, and precipitated.
6. Discuss why transpiration did not occur.

Pre Visit 3  
Survival  
6-8



## Entomophagy

Eatbug.com

### Purpose/Objective

Students will be able to state the benefits of eating insects  
Students will make a brochure/flyer to educate others about eating insects

### Materials

Computer access  
Reference books  
Paper

### Procedure

1. Write 'Entomophagy' on the board or over head.
2. Have students write a definition for the word, and a reason why they think it means that.
3. Share their definitions.
4. Tell the class the definition of the suffix -phage which is

VARIANT FORMS: -phagia or -phagy

SUFFIX: The eating of a specified substance or eating in a specified manner: dysphagia.

ETYMOLOGY: Greek -phagi, from phagein, to eat ([://www.bartleby.com](http://www.bartleby.com).)

5. Ask the class to re think their definitions in pairs.
6. Have the pairs present their new definitions and how they came to those conclusions.
7. Tell the class the definition of the root/prefix entomo-

entomo-, entom-

(Greek: insect, bug; literally, "cut up, cut in pieces"; an insect because it appears to be segmented) ([://www.wordinfo.com](http://www.wordinfo.com).)

2. Ask the class as a whole to come up with a definition now that they know the root and suffix meaning.
3. Brainstorm and list where and when people would willingly eat insects.
4. Discuss some cultures that eat insects on a regular basis. If time allows, have the students do the research-some site you can use :
  1. [://www.riverdeep.net/current/2002/03/030402\\_eatingbugs](http://www.riverdeep.net/current/2002/03/030402_eatingbugs).
  2. [://www.eatbug.com/](http://www.eatbug.com/)



3. [://vm.cfsan.fda.gov/%7Edms/dalbook](http://vm.cfsan.fda.gov/%7Edms/dalbook). (this is the food and drug administration web site, it has a by letter database to look up specific foods. Use this site for the next step)
5. Ask students if they have ever eaten an insect on purpose. Explain the Food And Drug Administrations 'Food Defect Action Levels' and give some examples (see FDA website above)
6. Pose a few discussion questions for homework or class discussion
  1. How do you feel about the FDA's policy that some of your food may be contaminated with insects? Which would you prefer: higher pesticide use at the risk of environmental pollution, or insects in your food? Provide reasons for your answer.
  2. Would you prefer that we hadn't told you about food contamination levels?
  3. When would you willingly eat an insect? Explain why you would be willing to eat it at that time.

Extend the activity

Have your students research what insects are edible in your state. Are there any clubs or organizations in the area that eat these insects on a regular basis? Would any of your students be willing to prepare an insect dish for the class?

Pre Visit 4  
Survival  
6-8



## Multiple uses

A person in a survival situation must think outside the box and use the items that they have with them to help them survive. This activity will help kids get into the mind set of looking at everyday things in a new way.

## Purpose/Objective

Students will be able to demonstrate new uses for an existing item  
Students will use creative thinking

## Materials

Everyday items that may be used during a camping trip  
Every item that is a typical lunch box

## Procedure

1. As a class, create a list of items that you would take on a common camping trip or put into a lunch box that is packaging, not food itself.
  - a. Example: Spoon, pudding cup, pudding cup lid, ziploc bag, aluminum foil, napkin.
2. As student name items, hold up an example of the item if you have it.
3. In pairs, have students pick one of the items that you physically have.
4. Tell the groups that they are to imagine that they are in a survival situation and they are to come up with as many uses for the item they have pick as possible. They should think of at least one possible function for the item in each of the following categories:
  - a. Food gathering
  - b. First aid
  - c. Protection
  - d. Water collection
  - e. Fire making
  - f. Shelter building/finding
5. Have pairs present their item to the class and tell all of the uses they have come up with.

## **Survival**

Grades: 6-8

Capacity: 50 people

Length: 3 hours

Description: Get lost!! Learn what it takes to survive if you ever get lost in the wilderness. Identify poisonous plants and animals you may encounter in Florida. Collect drinking water using only what you have in your lunch box. Build a shelter using only what you brought with you and the things that nature has to provide.

SSS 6-8

SC.B.2.3.1, SC.D.1.3.3, SC.D.2.3, SC.G.2.3

Pre-Visit Activity 1

Survival Vocabulary

Pre-Visit Activity 2

Lashing

Purpose:

Students will be able to make a square lash two poles together

Materials:

2 per student – 8-12 inch dowels, sticks, or tightly rolled paper

1 per student – 3-5 feet of string or yarn

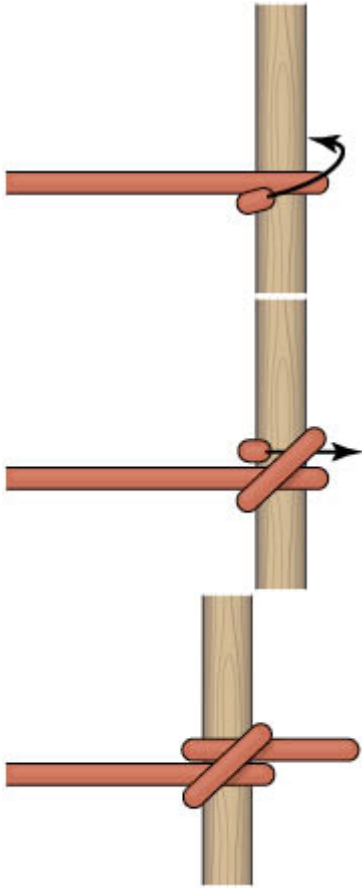
Over head transparencies of lashing steps (optional)

Procedure:

1. Introduce and define the word lashing (1. the act of tying objects together or securing them in position; 2. also refers to the rope used to do that)
2. As a class brainstorm where/how lashing would be important (tying boats together, building rafts, building huts etc.)
3. Pass out the materials and as a class practice the clove hitch.
4. Using the clove hitch, practice the square lashing
5. Brainstorm what could be made with more sticks and more rope/string/yarn

## **Clove Hitch**

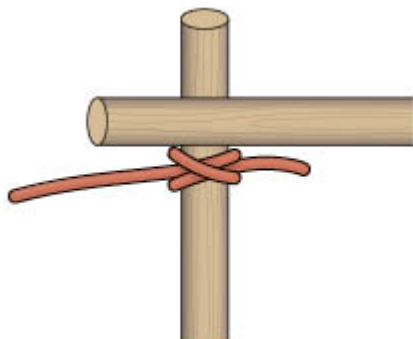
A hitch used primarily to secure a horizontal bar or pole. It's easy to tie and untie but may spill if the load twists or sways.



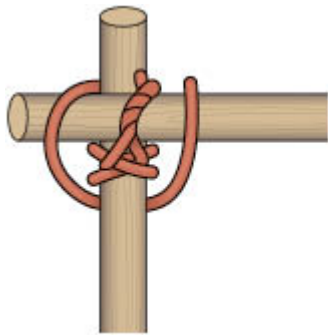
## Square Lashing

A lashing used to fasten together two poles so that they cross at an angle between  $45^\circ$  and  $90^\circ$  and are in direct contact with each other. The square lashing is considered the most secure lashing.

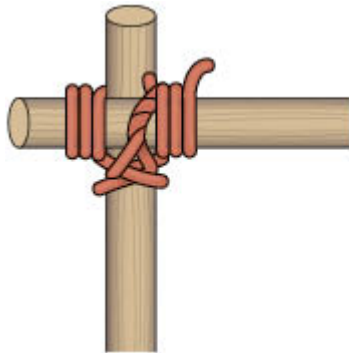
1. Tie a  on the vertical pole, beneath the horizontal pole.



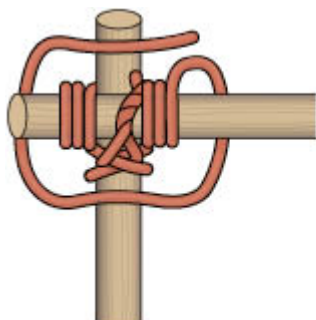
2. Wrap the working end diagonally across the horizontal pole, twisting the tail of the clove hitch around it as you do. Now wrap behind the vertical pole, down and in front of the horizontal pole, and behind the vertical pole again.



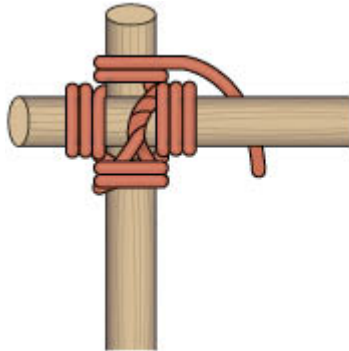
3. Repeat step 2 twice more.



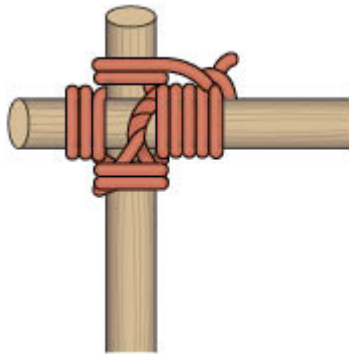
4. Wrap behind the horizontal pole, in front of the vertical pole, behind the horizontal pole again, and then in front of the vertical pole again.



5. Repeat step 4.



6. Tie a clove hitch on the horizontal pole.



### Pre-visit Activity 3 Water Cycle

#### Purpose:

Students will be able to define evaporation, transpiration, condensation, and precipitation in relation to the water cycle.

#### Materials:

large hand mirror  
freezer or ice cubes  
pot holder  
kettle or pot  
water

#### Procedure:

1. Place 'Water Cycle' on the board or over head.

2. Do a 'think pair share' to come up with an explanation for or a definition of 'Water Cycle.
3. If students have not used the terms Evaporation, Transpiration, Precipitation, and/or Condensation, define them and add them into the working explanation of the water cycle.
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  3. When the water is boiling, hold the mirror so that the steam (water vapor) is hitting it. Use a pot holder or glove to protect your hand. Steam or hot water vapor can burn your skin. Ask an adult for help using the stove and holding the mirror.
5. Have students draw a picture of the kettle, stove, mirror set up and label where the water evaporated, condensed, and precipitated.
6. Discuss why transpiration did not occur.

#### Pre-Visit Activity 4

#### Entomophagy

Eatbug.com

#### Purpose:

Students will be able to state the benefits of eating insects

Students will make a brochure/flyer to educate others about eating insects

#### Materials:

Computer access

Reference books

Paper

#### Procedure:

1. Write 'Entomophagy' on the board or over head.
2. Have students write a definition for the word, and a reason why they think it means that.
3. Share their definitions.
4. Tell the class the definition of the suffix -phage which is

VARIANT FORMS: -phagia or -phagy

SUFFIX: The eating of a specified substance or eating in a specified manner: dysphagia.

ETYMOLOGY: Greek -phagi, from phagein, to eat ( [://www.bartleby.com](http://www.bartleby.com) )

5. Ask the class to re think their definitions in pairs.
6. Have the pairs present their new definitions and how they came to those conclusions.
7. Tell the class the definition of the root/prefix entomo-

entomo-, entom-

(Greek: insect, bug; literally, "cut up, cut in pieces"; an insect because it appears to be segmented) ( [://www.wordinfo.com](http://www.wordinfo.com) )

7. Ask the class as a whole to come up with a definition now that they now the root and suffix meaning.
8. Brainstorm and list where and when people would willingly eat insects.
9. Discuss some cultures that eat insects on a regular basis. If time allows, have the students do the research-some site you can use :
  1. [://www.riverdeep.net/current/2002/03/030402\\_eatingbugs](http://www.riverdeep.net/current/2002/03/030402_eatingbugs).
  2. [://www.eatbug.com/](http://www.eatbug.com/)
  3. [://vm.cfsan.fda.gov/%7Edms/dalbook](http://vm.cfsan.fda.gov/%7Edms/dalbook). (this is the food and drug administration web site, it has a by letter database to look up specific foods. Use this site for the next step)
10. Ask students if they have ever eaten an insect on purpose. Explain the Food And Drug Administrations 'Food Defect Action Levels' and give some examples (see FDA website above)
11. Pose a few discussion questions for homework or class discussion
  1. How do you feel about the FDA's policy that some of your food may be contaminated with insects? Which would you prefer: higher pesticide use at the risk of environmental pollution, or insects in your food? Provide reasons for your answer.
  2. Would you prefer that we hadn't told you about food contamination levels?
  3. When would you willingly eat an insect? Explain why you would be willing to eat it at that time.

Extend the activity

Have your students research what insects are edible in your state. Are there any clubs or organizations in the area that eat these insects on a regular basis? Would any of your students be willing to prepare an insect dish for the class?

Pre-visit Activity 5

Multiple uses

A person in a survival situation must think outside the box and use the items that they have with them to help them survive. This activity will help kids get into the mind set of looking at everyday things in a new way.

Purpose:

Students will be able to demonstrate new uses for an existing item

Students will use creative thinking

Materials:

Everyday items that may be used during a camping trip

Every item that is a typical lunch box

Procedure:

1. As a class, create a list of items that you would take on a common camping trip or put into a lunch box that is packaging, not food itself.



- a. Example: Spoon, pudding cup, pudding cup lid, ziploc bag, aluminum foil, napkin.
2. As student name items, hold up an example of the item if you have it.
3. In pairs, have students pick one of the items that you physically have.
4. Tell the groups that they are to imagine that they are in a survival situation and they are to come up with as many uses for the item they have pick as possible. They should think of at least one possible function for the item in each of the following categories:
  - a. Food gathering
  - b. First aid
  - c. Protection
  - d. Water collection
  - e. Fire making
  - f. Shelter building/finding
5. Have pairs present their item to the class and tell all of the uses they have come up with.

### Post-Visit Activity 1 Survival Scenario Games

Now that the students have a better understanding of what they would need to survive, have them try one of these challenges.

#### Purpose:

Students will be able to list items of importance in a survival situation

#### Materials:

Supply lists for each group

Pencils

#### Procedure:

1. Review with students the three things you need to survive:
  - a. Food
  - b. Water
  - c. Shelter
2. Once those three things are located, what is the most important thing to do?
  - a. Signal for help
3. Place students into groups and read the survival scenario (plane crash or water).
4. Hand out the list of supplies and each group should rank them in order of importance, 1 being the most important. They should also give a reason why they ranked it at that number
5. Have the groups present their ranking, allow time for debate among the groups about their ranking.
6. Share the 'correct' answers with the class.

## Scenario 1

### **Lost at Sea Exercise**

#### **Scenario:**

- You and your team have chartered a yacht.
- None of you have any previous sailing experience, and you have hired an experienced skipper and two-person crew.
- As you sail through the Southern Pacific Ocean a fire breaks out and much of the yacht and its contents are destroyed.
- The yacht is slowly sinking.
- Your location is unclear because vital navigational and radio equipment has been damaged.
- The yacht skipper and crew have been lost whilst trying to fight the fire.
- Your best guesstimate is that you are approximately 1000 miles South West of the nearest landfall.
- You and your friends have managed to save the following 15 items, undamaged and intact after the fire.
  1. A sextant
  2. A shaving mirror
  3. A quantity of mosquito netting
  4. A 5 gallon can of water
  5. A case of army rations
  6. Maps of the Pacific Ocean
  7. A floating seat cushion
  8. A 2 gallon can of oil/petrol mixture
  9. A small transistor radio
  10. 20 square feet of Opaque plastic sheeting
  11. Shark repellent
  12. One quart of 160 per cent proof rum
  13. 15ft nylon rope
  14. 2 boxes of chocolate bars
  15. A fishing kit
- In addition to the above, you have salvaged a four man rubber life craft.
- The total contents of your combined pocket's amounts to a packet of cigarettes, three boxes of matches and 3 \$5 notes.

Answers:

#### **Lost at Sea Rationale**

According to the experts (US Coastguard), the basic supplies needed when a person is stranded mid-ocean are articles to attract attention and articles to aid survival until rescue arrives. Articles for navigation are of little importance since even if a small life raft were capable of reaching land, it would be impossible to store enough food and water to survive for the requisite amount of time.

Without signaling devices, there is almost no chance of being spotted and ultimately rescued. Furthermore, most rescues occur within the first 36 hours and a person can survive with only a minimum of food and water during that period.

So, the following is the order of ranking the items in their importance to your survival:

1. Shaving Mirror  
Critical for signaling
2. 2 gallon can of oil/petrol mixture  
Critical for signaling.  
The mixture will float on water and could be ignited with one of the \$5 bills and a match.  
*What the experts don't say is how you get away from this conflagration or what to do if the wind should push the life raft into the flames!*
3. 5 gallon can of water  
Necessary to replenish fluids lost through perspiration (*that's sweat*)
4. One case of army rations  
Basic food intake
5. 20 square feet of opaque plastic  
Can be utilised to collect rain water and provide shelter from the elements
6. 2 boxes of chocolate bars  
Reserve food supply (*what were you going to do with that much chocolate?*)
7. Fishing kit  
Ranked lower than the chocolate as 'a bird in the hand is worth two in the bush' There is no guarantee you will catch any fish.

8. 15ft of nylon rope  
Could be used to lash people or equipment together to prevent it being washed overboard.
9. Floating seat cushion  
A life preserver if someone fell overboard
10. Shark repellent  
Enough said
11. One quart of 160 per cent proof rum  
Contains 80% alcohol, which is enough to be used as an antiseptic for any injuries, otherwise of little value – would cause dehydration if ingested (*that's drunk to you and me*)
12. Small transistor radio  
Of no use without a transmitter. You would also be out of range of any radio station.
13. Maps of the Pacific Ocean  
Worthless without navigation equipment. It does not matter where you are but **where the rescuers are!**
14. Mosquito netting  
There are **NO** mosquitos in the midpacific ocean. As for fishing with it? – stick to the fishing kit.
15. Sextant  
Useless without the relevant tables and a chronometer.

## Scenario 2

You and your companions have just survived the crash of a small plane. Both the pilot and co-pilot were killed in the crash. It is mid-January, and you are in Northern Canada. The daily temperature is 25 below zero, and the night time temperature is 40 below zero. There is snow on the ground, and the countryside is wooded with several creeks criss-crossing the area. The nearest town is 20 miles away. You are all dressed in city clothes appropriate for a business meeting. Your group of survivors managed to salvage the following items:

A ball of steel wool

A small ax

A loaded .45-caliber pistol

Can of Crisco shortening

Newspapers (one per person)

Cigarette lighter (without fluid)

Extra shirt and pants for each survivor

20 x 20 ft. piece of heavy-duty canvas

A sectional air map made of plastic

One quart of 100-proof whiskey

A compass

Family-size chocolate bars (one per person)

Your task as a group is to list the above 12 items in order of importance for your survival. List the uses for each. You **MUST** come to agreement as a group.

## **EXPLANATION**

Mid-January is the coldest time of year in Northern Canada. The first problem the survivors face is the preservation of body heat and the protection against its loss. This problem can be solved by building a fire, minimizing movement and exertion, using as much insulation as possible, and constructing a shelter.

The participants have just crash-landed. Many individuals tend to overlook the enormous shock reaction this has on the human body, and the deaths of the pilot and co-pilot increases the shock. Decision-making under such circumstances is extremely difficult. Such a situation requires a strong emphasis on the use of reasoning for making decisions and for reducing fear and panic. Shock would be shown in the survivors by feelings of helplessness,

loneliness, hopelessness, and fear. These feelings have brought about more fatalities than perhaps any other cause in survival situations. Certainly the state of shock means the movement of the survivors should be at a minimum, and that an attempt to calm them should be made.

Before taking off, a pilot has to file a flight plan which contains vital information such as the course, speed, estimated time of arrival, type of aircraft, and number of passengers. Search-and-rescue operations begin shortly after the failure of a plane to appear at its destination at the estimated time of arrival.

The 20 miles to the nearest town is a long walk under even ideal conditions, particularly if one is not used to walking such distances. In this situation, the walk is even more difficult due to shock, snow, dress, and water barriers. It would mean almost certain death from freezing and exhaustion. At temperatures of minus 25 to minus 40, the loss of body heat through exertion is a very serious matter.

Once the survivors have found ways to keep warm, their next task is to attract the attention of search planes. Thus, all the items the group has salvaged must be assessed for their value in signaling the group's whereabouts.

The ranking of the survivors items was made by Mark Wanvig, a former instructor in survival training for the Reconnaissance School of the 101st Division of the U.S. Army. Mr. Wanvig currently conducts wilderness survival training programs in the Minneapolis, Minnesota area. This survival simulation game is used in military training classrooms.

## **RANKINGS**

### **1. Cigarette lighter (without fluid)**

The gravest danger facing the group is exposure to cold. The greatest need is for a source of warmth and the second greatest need is for signaling devices. This makes building a fire the first order of business. Without matches, something is needed to produce sparks, and even without fluid, a cigarette lighter can do that.

### **2. Ball of steel wool**

To make a fire, the survivors need a means of catching the sparks made by the cigarette lighter. This is the best substance for catching a spark and supporting a flame, even if the steel wool is a little wet.

### 3. Extra shirt and pants for each survivor

Besides adding warmth to the body, clothes can also be used for shelter, signaling, bedding, bandages, string (when unraveled), and fuel for the fire.

### 4. Can of Crisco shortening

This has many uses. A mirror-like signaling device can be made from the lid. After shining the lid with steel wool, it will reflect sunlight and generate 5 to 7 million candlepower. This is bright enough to be seen beyond the horizon. While this could be limited somewhat by the trees, a member of the group could climb a tree and use the mirrored lid to signal search planes. If they had no other means of signaling than this, they would have a better than 80% chance of being rescued within the first day.

There are other uses for this item. It can be rubbed on exposed skin for protection against the cold. When melted into an oil, the shortening is helpful as fuel. When soaked into a piece of cloth, melted shortening will act like a candle. The empty can is useful in melting snow for drinking water. It is much safer to drink warmed water than to eat snow, since warm water will help retain body heat. Water is important because dehydration will affect decision-making. The can is also useful as a cup.

### 5. 20 x 20 foot piece of canvas

The cold makes shelter necessary, and canvas would protect against wind and snow (canvas is used in making tents). Spread on a frame made of trees, it could be used as a tent or a wind screen. It might also be used as a ground cover to keep the survivors dry. It's shape, when contrasted with the surrounding terrain, makes it a signaling device.

### 6. Small ax

Survivors need a constant supply of wood in order to maintain the fire. The ax could be used for this as well as for clearing a sheltered campsite, cutting tree branches for ground insulation, and constructing a frame for the canvas tent.

### 7. Family size chocolate bars (one per person)

Chocolate will provide some food energy. Since it contains mostly carbohydrates, it supplies the energy without making digestive demands on the body.

### 8. Newspapers (one per person)

These are useful in starting a fire. They can also be used as insulation under clothing when rolled up and placed around a person's arms and legs. A

newspaper can also be used as a verbal signaling device when rolled up in a megaphone-shape. It could also provide reading material for recreation.

#### 9. Loaded .45-caliber pistol

The pistol provides a sound-signaling device. (The international distress signal is 3 shots fired in rapid succession). There have been numerous cases of survivors going undetected because they were too weak to make a loud enough noise to attract attention. The butt of the pistol could be used as a hammer, and the powder from the shells will assist in fire building. By placing a small bit of cloth in a cartridge emptied of its bullet, one can start a fire by firing the gun at dry wood on the ground. The pistol also has some serious disadvantages. Anger, frustration, impatience, irritability, and lapses of rationality may increase as the group awaits rescue. The availability of a lethal weapon is a danger to the group under these conditions. Although a pistol could be used in hunting, it would take an expert marksman to kill an animal with it. Then the animal would have to be transported to the crash site, which could prove difficult to impossible depending on its size.

#### 10. Quart of 100 proof whiskey

The only uses of whiskey are as an aid in fire building and as a fuel for a torch (made by soaking a piece of clothing in the whiskey and attaching it to a tree branch). The empty bottle could be used for storing water. Can also be used as an antiseptic for a wound. The danger of whiskey is that someone might drink it, thinking it would bring warmth. Alcohol takes on the temperature it is exposed to, and a drink of minus 30 degrees Fahrenheit whiskey would freeze a person's esophagus and stomach. Alcohol also dilates the blood vessels in the skin, resulting in chilled blood being carried back to the heart, resulting in a rapid loss of body heat. Thus, a drunk person is more likely to get hypothermia than a sober person is.

#### 11. Compass

Because a compass might encourage someone to try to walk to the nearest town, it is a dangerous item. Its only redeeming feature is that it could be used as a reflector of sunlight (due to its glass top).

#### 12. Sectional air map made of plastic

This is also among the least desirable of the items because it will encourage individuals to try to walk to the nearest town. Its only useful feature is as a ground cover to keep someone dry.

Scenario 3



## Just for fun

You are a member of a space crew originally scheduled to rendezvous with a mother ship on the lighted surface of the moon. However, due to mechanical difficulties, your ship was forced to land at a spot some 200 miles from the rendezvous point. During reentry and landing, much of the equipment aboard was damaged and, since survival depends on reaching the mother ship, the most critical items available must be chosen for the 200-mile trip. Below are listed the 15 items left intact and undamaged after landing. Your task is to rank order them in terms of their importance for your crew in allowing them to reach the rendezvous point. Place the number **1** by the most important item, the number **2** by the second most important, and so on through number **15** for the least important.

### Your Ranking NASA Ranking

- \_\_\_\_\_ Box of matches \_\_\_\_\_
- \_\_\_\_\_ Food concentrate \_\_\_\_\_
- \_\_\_\_\_ 50 feet of nylon rope \_\_\_\_\_
- \_\_\_\_\_ Parachute silk \_\_\_\_\_
- \_\_\_\_\_ Portable heating unit \_\_\_\_\_
- \_\_\_\_\_ Two .45 caliber pistols \_\_\_\_\_
- \_\_\_\_\_ One case of dehydrated milk \_\_\_\_\_
- \_\_\_\_\_ Two 100 lb. tanks of oxygen \_\_\_\_\_
- \_\_\_\_\_ Stellar map \_\_\_\_\_
- \_\_\_\_\_ Self-inflating life raft \_\_\_\_\_
- \_\_\_\_\_ Magnetic compass \_\_\_\_\_
- \_\_\_\_\_ 5 gallons of water \_\_\_\_\_
- \_\_\_\_\_ Signal flares \_\_\_\_\_
- \_\_\_\_\_ First aid kit, including injection needle \_\_\_\_\_
- \_\_\_\_\_ Solar-powered FM receiver-transmitter \_\_\_\_\_

### Answers to the Survival on the Moon Exercise

Item	NASA Ranking	NASA's Reasoning
Box of matches	<b>15</b>	Virtually worthless -- there's no oxygen on the moon to sustain combustion

Food concentrate	<b>4</b>	Efficient means of supplying energy requirements
50 feet of nylon rope	<b>6</b>	Useful in scaling cliffs and tying injured together
Parachute silk	<b>8</b>	Protection from the sun's rays
Portable heating unit	<b>13</b>	Not needed unless on the dark side
Two .45 caliber pistols	<b>11</b>	Possible means of self-propulsion
One case of dehydrated milk	<b>12</b>	Bulkier duplication of food concentrate
Two 100 lb. tanks of oxygen	<b>1</b>	Most pressing survival need (weight is not a factor since gravity is one-sixth of the Earth's -- each tank would weigh only about 17 lbs. on the moon)
Stellar map	<b>3</b>	Primary means of navigation - star patterns appear essentially identical on the moon as on Earth
Self-inflating life raft	<b>9</b>	bottle in military raft may be used for propulsion
Magnetic compass	<b>14</b>	The magnetic field on the moon is not polarized, so it's worthless for navigation
5 gallons of water	<b>2</b>	Needed for replacement of tremendous liquid loss on the light side
Signal flares	<b>10</b>	Use as distress signal when the mother ship is sighted
First aid kit, including injection needle	<b>7</b>	Needles connected to vials of vitamins, medicines, etc. will fit special aperture in NASA space

		suit
Solar-powered FM receiver-transmitter	<b>5</b>	For communication with mother ship (but FM requires line-of-sight transmission and can only be used over short ranges)

[://wilderdom.com/games/descriptions/SurvivalScenarios.](http://wilderdom.com/games/descriptions/SurvivalScenarios)

## Post-Visit Activity 2 Solar Still

### Purpose:

Students will be able to calculate the amount of water gathered in a solar still in one school day.

### Materials:

Shovels or digging tools

Large piece of clear plastic tarp

Plastic tupper ware container or cup

Large open, sunny area where you will have permission to dig

Flagging tape to mark the area so no one disturbs it.

Yard sticks or measuring tape

Graduated cylinder

### Procedure:

1. As the students to describe in a drawing or in writing how the solar still works. This should include the words evaporation and condensation.
2. Take the students out to the area that you have permission to dig.
3. Break the kids up into teams depending on how much space and materials you have.
4. Have each group dig a hole. They can all be the same dimensions (ei 1ft wide by 1ft deep) and you can compare the amount of water collected from different soil types. Or, each hole can be a different size (ie 1 ft wide, 1 ft deep, and 1 ft wide 2 ft deep, and 2 ft wide, 1 ft deep) to compare the amount of water collected by dimensions.
5. Dig the holes and have the students build the solar stills like they did at Crystal Springs Preserve, tupper ware or cup at the bottom to collect the water, plastic stretched across the top and sealed at the edges with dirt, one small rock or weight in the center of the plastic over the water collecting cup.
6. Leave the stills alone for a full day if possible.
7. Carefully remove the plastic cover, make observations about condensation on the plastic that did not drip into the cup.

8. Measure the amount of water collected in the cups/tupper ware using the graduated cylinder.
9. Make a chart to compare hole size to amount of water collected or soil type to amount of water collected.
10. What conclusion can you draw from your data?

### Post-visit Activity 3

O is for Observe

#### Purpose:

Student will be able to identify plants on their campus and any survival uses that they may have and any dangers they may pose

#### Materials:

Florida plant field guides

Digital camera and/or permission to collect and press plant samples

Paper and printer for making brochure to share

#### Procedure:

1. Discuss the hierarchy of needs in a survival situation: shelter, then water, lastly food.
2. Make a list on the board/overhead of plants that are common in your area that are edible and ones that are poisonous
3. Make a third list of plants that the class knows but does not know if they are edible or poisonous
4. Take a tour of your campus
5. Have students collect pictures or plants that they find or samples of the plants if you have permission
6. Back in the classroom, use field guides and websites to identify the plants that they have collected.
7. List any benefits or harmful parts of the plants.
8. Have students make brochures about the plants found on your campus

[://www.equipped.org/21-76/ch9.](http://www.equipped.org/21-76/ch9)

### Post-visit Activity 4

Other kids Survival

#### Purpose:

Students will read an age appropriate book about a kid in a survival situation

#### Materials:

Several young adult novels about survival

#### Procedure:

1. Arrange a visit to your school library. Have your librarian pull all the young adult survival novels that are available.
2. Ask the librarian to book talk the books or do it yourself.
3. Let each student choose a book or find one on their own at another library.
4. Set a date that the books must be completed.
5. Have the students list all the tricks, tools, skills, and smart ideas that the character in their book used to survive. What mistakes did they make? What would the students have done if they were put into the same situation?
6. Allow each student to present their book to the class. They should give a brief book talk (why someone would enjoy this book, they should not give away the ending) and include their favorite survival trick/skill that a character used in the book.

Book list websites

[://www.carnegielibrary.org/teens/read/booklists/outdoorpursuits.](http://www.carnegielibrary.org/teens/read/booklists/outdoorpursuits)

[://browse.barnesandnoble.com/browse/nav.asp?visgrp=children's&N=700121&Ne=700108+700109+700121&z=](http://browse.barnesandnoble.com/browse/nav.asp?visgrp=children's&N=700121&Ne=700108+700109+700121&z=)

[://www.harf.lib.md.us/kids/booklists/middleschool/survival.](http://www.harf.lib.md.us/kids/booklists/middleschool/survival)

Post-visit Activity 5

Classroom survival

Purpose:

Students will help prepare a classroom survival kit

Materials:

This will depend on the list that your students come up with. Ask for parent donations if necessary.

Procedure:

1. As a class list all the things that were placed into the 'day hike' backpack at Crystal Springs Preserve.
2. Go through each item and list what it's purpose was in the pack and what it could have been used for in a survival situation.
3. Talk about disasters that happen in your area (hurricanes, floods, tornadoes, if they are old enough, terrorists or other attack)

## Survival Vocabulary (Middle School)

**Poisonous** – Capable of harming or killing by a poison or toxin.

**Toxic** – Acting or having the effect of a poison.

**Camouflage** - Concealment by some means that alters or obscures the appearance.

**Edible** – Fit to be eaten as food.

**Transpiration** – The passage of water through a plant from the roots through the vascular system to the atmosphere.

**Solar Energy** – Energy derived from the sun in the form of solar radiation.

**Vegetation** – All the plants or plant life of a place, taken as a whole.

**Environment** – the air, water, minerals, organisms, and all other external factors surrounding and affecting a given organism at any time.

**Habitat** - A place that is natural for the life and growth of an organism.

**Evaporation** – The process of water converting or changing into water vapor.

**Dehydration** – Excessive loss of water from the body.

**Condensation** – The process of by which a gas or vapor changes to a liquid.

**Dew** – Moisture from the atmosphere, especially at night, that deposits in the form of small drops on a surface such as grass.

**Shelter** – A dwelling place or home considered as a refuge from the elements.

**Observation** – The act of observing; taking a patient look.

## Survival Vocabulary (Elementary)

**Poisonous** – Capable of harming or killing by a poison or toxin.

**Toxic** – Acting or having the effect of a poison.

**Camouflage** - Concealment by some means that alters or obscures the appearance.

**Edible** – Fit to be eaten as food.

**Transpiration** – The passage of water through a plant from the roots through the vascular system to the atmosphere.

**Solar Energy** – Energy derived from the sun in the form of solar radiation.

**Vegetation** – All the plants or plant life of a place, taken as a whole.

**Environment** – the air, water, minerals, organisms, and all other external factors surrounding and affecting a given organism at any time.

**Habitat** - A place that is natural for the life and growth of an organism.

**Evaporation** – The process of water converting or changing into water vapor.

**Dehydration** – Excessive loss of water from the body.

**Condensation** – The process of by which a gas or vapor changes to a liquid.

**Dew** – Moisture, especially at night, that deposits in the form of small drops on a surface such as grass.

**Shelter** – A place or home to protect you from the sun, wind, rain, etc.

**Observation** – Observing the sights, sounds, and smells around you.