



Overview:

In this lesson, students will explore emergency survival skills as a lifesaving tool in the event of an emergency and talk to an Elder or culture bearer to learn about traditional survival skills.

Targeted Alaska Grade Level Expectations:

Science

- [7]SF1.1-SF3.1 The student demonstrates an understanding of the dynamic relationships among scientific, cultural, social, and personal perspectives by investigating the basis of local knowledge (e.g., describing and predicting weather) and sharing that information. (L) Cross referenced with SA3.1
- [8]SF1.1-SF3.1 The student demonstrates an understanding of the dynamic relationships among scientific, cultural, social, and personal perspectives by describing how local knowledge, culture, and the technologies of various activities (e.g., hunting, fishing, subsistence) influence the development of scientific knowledge. (L) Cross referenced with SA3.1, grade 8
- [9]SB2.1 The student demonstrates an understanding of how energy can be transformed, transferred and conserved by applying the concepts of heat transfer (i.e. conduction, convection, radiation) to Alaskan dwellings.
- [9]SE2.1 The student demonstrates an understanding that solving problems involves different ways of thinking by questioning, researching, modeling, simulating, and testing a solution to a problem.

Reading

- [7]3.4.2 The student demonstrates understanding of main ideas/arguments by locating information in narrative and informative text to answer questions related to main ideas or key details.
- [7]3.4.4 The student demonstrates understanding of main ideas/arguments by explaining connections among main ideas/concepts (text to self, text to text, text to world). (L)

Objectives:

The student will:

- identify both traditional and Western emergency survival techniques;
- explore the relationship between hypothermia and heat loss caused by radiation, conduction, convection and evaporation; and
- create an emergency survival plan based on a proposed scenario.

Materials:

- Book: *Shadows on the Koyukuk: An Alaskan Native's Life Along the River*. Huntington, Sidney, 1915
- TEACHER INFORMATION SHEET: "Building a Shelter"
- OVERHEAD: "Building a Shelter"
- STUDENT INFORMATION SHEET: "Knowledge is Key in Emergency Survival"
- STUDENT WORKSHEET: "I'm a Survivor!"

Whole Picture:

This lesson serves only as an introduction to emergency survival. It would be highly beneficial for students to explore survival information beyond this lesson.

Embedded in the values of Alaska Native culture is preparedness. In this lesson students will read the words of Aleut Elder John "Smile" Knutsen. "You have to be prepared; be aware all the time. Let someone know where you are going, how long you're going to be there, when you're coming back. The most important thing is your mind—being prepared for anything that might come up."

Activity Preparation:

1. Contact an Elder or culture bearer and invite them to visit your class to share information about traditional wilderness survival techniques. Ask the Elder to arrive at a time that will allow the class to be settled and have reviewed the introductory question. Prepare students ahead of time to have appropriate and respectful behavior when an Elder is present.
2. When the Elder or culture bearer arrives, have students greet the guest and escort them to the classroom. Offer refreshments and invite the person to a comfortable spot until they are introduced, but do not keep them waiting long. As Chief Robert Charlie says, "Would you keep the governor waiting?"

Activity Procedure:

1. Write the following question on the board: "What would you do if you were stranded for a night in the wilderness with little or no supplies?" Ask students to think about the question for a minute then share with a partner.
2. Introduce Elder or culture bearer and ask them to share a story or an impression about wilderness survival, why such knowledge is important, and how students could learn more. Give students an opportunity to ask questions. Invite the Elder to stay for the remaining class time, if they wish, or leave at that time.
3. Read students an excerpt from *Shadows on the Koyukuk: An Alaskan Native's Life Along the River*, by Sidney Huntington. Start on page 142 beginning midway at "My dictionary says..." and read through 145. (Note: "Siwash" is pronounced with a long i sound.)
4. Ask students to share their thoughts about the reading, then as a class discuss the following:
 - a. What kinds of situations could lead to having to spend a night or more in the wilderness?
 - b. Who feels they could make it through the night during extremely windy and rainy weather? How about surviving the night at -10° F?
 - c. What do you know about survival techniques?
5. Hand out STUDENT INFORMATION SHEET: "Knowledge is Key in Emergency Survival." Ask for volunteers to read each section. Discuss. As students read, ask them to give examples of conduction, radiation, convection, and insulation.
6. Show students the OVERHEAD: "Building a Shelter" for both a debris shelter and a snow pit. Explain the process and reasoning behind each step—related to hypothermia and insulation. (Refer to both student information sheet and teacher information sheet for details.)
7. Hand out STUDENT WORKSHEET: "I'm a Survivor!" Ask students to work in pairs or in small groups to complete the assignment. Students should produce a plan based on what they have learned. Advise students to think about what they could use from the environment and how they could use what they have with them. Students must assume they have no cellular phone coverage, are out of radio range, and have no access to vehicles or buildings, etc. Students should write about the plan and illustrate it on notebook paper or chart paper. When students are finished, ask groups to volunteer to share their plan with the rest of the class.
8. Further discussion:
 - a. Do you think Sidney would have survived without the means to start a fire? Why or why not?
 - b. Who taught Sidney the survival techniques he used that night?
 - c. Sidney got caught up in the moment when chasing the marten and made some serious mistakes. What were some of those mistakes?
 - d. What did Sidney do that saved his life?
 - e. Why is it important to be prepared for an emergency?

- f. Embedded in Alaska Native culture is the value of being prepared for anything that could happen. What do you think Western culture could learn from that?
- g. Where did Sidney learn the knowledge that saved his life?
- h. What ways have you heard about that allow you to start a fire without matches or a lighter?
- i. Why would it be unwise to start a forest fire to attract attention?
- j. What kinds of traditional survival methods are still used today?

Extension Ideas:

- Take students out to a wooded area and practice making an emergency debris shelter or snow shelter. Have students do temperature measurements with a person inside the shelter and contrast with the outside temperature.
- Ask students to research methods for starting a fire with and without matches or a lighter. There are a lot of interesting and unique methods—like using a potato chip! Investigate fire safety and how to avoid forest fires. Ask students to research fire pit methods such as the Dakota Fire Hole and the Firebed.
- Develop a class emergency kit.
- Invite a Forest Service Ranger, a Fish and Game biologist or other expert into class to talk about the importance of preparedness.
- Have students read a story about survival or research survival accounts in the news.
- Investigate the way animals stay warm in the wilderness and what people can learn from them.
- Watch a survival movie.

Answers:

Answers will vary.

Additional Resources:

- Huntington, S., & Rearden, J. (1993). *Shadows on the Koyukuk: An Alaska native's life along the river*. Anchorage, AK: Alaska Northwest Books. (For readers above a 9th grade level.)
- Salisbury, G. (2007). *Night of the howling dogs*. New York, NY: Wendy Lamb Books. (For readers above a 7th grade level.)
- Hill, K. (1990). *Toughboy & sister*. New York, NY: Puffin Books. (For readers at a 5th grade level.)
- Smelcer, J. (2006). *The day that cries forever*. Anchorage, AK: Chenega Future, Inc.
- Earth connections school of wilderness survival and ancient skills*. (2000) <http://www.earth-connection.com/>

Lesson Information Sources:

- Huntington, S., & Rearden, J. (1993). *Shadows on the Koyukuk: An Alaska native's life along the river*. Anchorage, AK: Alaska Northwest Books.
- Dehydration*. (2009) Retrieved September 22, 2009 from <http://www.mayoclinic.com/health/dehydration/DS00561>
- Outdoor action guide to hypothermia and cold weather injuries*. (2009). Retrieved September 22, 2009 from <http://www.princeton.edu/~oa/safety/hypocold.shtml>
- How to build a decent wilderness survival kit*. (2009). Retrieved September 22, 2009, from <http://www.m4040.com/Survival/Survival%20Kit.htm>
- Types of shelters*. (2009). Retrieved September 22, 2009, from <http://www.wilderness-survival.net/shelters-2.php>

Piven, J., & Borgenicht, D. (2001). *The worst-case scenario survival handbook: Travel*. San Francisco, CA: Chronicle Books.

Wilderness survival. (2009) Retrieved September 22, 2009, from <http://www.wilderness-survival.net/shelters-2.php>

Cloyd, W. Personal INTERVIEW with John "Smile" Knutsen, Aleut Elder from Naknek. 1 October 2009. (2009, January 20). *Water Procurement*. Retrieved from <http://www.aircav.com/survival/asch06/asch06p01.html>



Alaska Native values emphasize that a person should always be prepared for anything that could happen. Common sense, resourcefulness and use of natural resources are important cultural values. In an emergency survival situation, this means knowing how to avoid hypothermia and dehydration. An emergency kit could mean the difference between life and death. If you are not prepared and become endangered, you put those attempting to locate and rescue you at risk. You also create fear and stress in your friends and family.

Hypothermia

Hypothermia is a life-threatening medical emergency that occurs when a body loses heat faster than it can produce it. When body temperature drops below 95° F (35° C) the heart, nervous system and other organs cannot function properly. If untreated, hypothermia eventually leads to organ failure and to death.

Hypothermia is most often caused by cold weather or falling into a cold body of water, but it can occur even in moderate weather. Heat always moves from an area of higher temperature to an area of lower temperature. (When your house gets cold in the winter, it isn't the cold moving in, it's the heat moving out.) Body heat is lost in four ways:



Radiation: loss of heat to the environment as the air temperature drops below the normal body temperature of 98.6° F (37° C); Heat radiates away from the body.

Conduction: Direct contact between objects of differing temperatures causes the direct transfer of heat. Water conducts heat away from the body much faster than air.

Convection: the transfer of heat energy in liquids and gases through the movement of the fluid; Wind chill is an example of the effects of air convection and evaporation.

Evaporation: heat loss from converting water from a liquid to a gas; The body's natural response to remove excess heat is to sweat, but if clothes get damp from sweat from exertion, the body will lose vital heat.

Keys to Survival:

- Keep insulated to stop heat from escaping.
- Get dry and stay dry.
- Find shelter from the wind.
- Do not exert yourself to the point of breaking a sweat.

Alaska Native Knowledge:

John "Smile" Knutsen, an Aleut Elder from Naknek, says dried grass is a good insulator in an emergency.

If you get wet, "Immediately take off those wet clothes and ring them out. Put them back on then stuff dry grass in your clothes for insulation."

Even if you aren't wet, putting grass in your clothes creates pockets of air that help you stay warm. Stay out of the wind by building a shelter out of the materials around you. "If you are in a place with no trees in the winter, find a snowdrift. Line it with willows and grass."

Knowledge is Key in Emergency Survival

Student Information Sheet

Insulation

To insulate means to slow the loss or transfer of heat. In a survival situation it is important to prevent heat loss.

Air trapped between layers of clothing acts as an insulator. (A thermos is an example of how this works. It has a vacuum between the inner container and the outer. Having a dead air space with few molecules really slows the transfer of heat.) Layer clothing, with the loosest as the outer layer, to insulate your body.



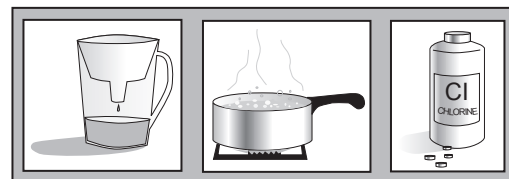
It is especially difficult to keep feet warm because the weight of the body pushes the trapped air out of the insulating material under the foot compressing it, which results in heat being conducted to the ground, or snow, more rapidly. This is why Bunny Boots, the nickname given to U.S. Army Extreme Cold Vapor Barrier Boots, are so effective at keeping feet warm. They provide layered dead air space underfoot along with an effective vapor barrier that prevents water from condensing inside.

Alaska Native Knowledge:

Always being prepared is an important cultural value. Part of that preparation is knowledge. If you don't have extra clothes, or if you need to boost the insulation in what you do have, pack dried grass or other dry, natural material to create pockets of air inside your clothes and boots.

Dehydration

Dehydration occurs when the body loses more fluid than it takes in. Severe loss of fluid can limit the body's ability to carry out normal functions. If you don't replenish lost fluids, you may suffer serious consequences.



There are three ways to make water safer to drink: filtration, boiling and chemical purification.

Why is dehydration a worry?

When a person has lost two percent of their body fluids, they feel thirsty. At a four to six percent loss, they may have a headache and feel irritable. A ten percent loss will cause dizziness and cyanosis (bluing of the skin due to decreased circulation). A person will be light-headed and may experience blackouts or fainting. At a 12 percent loss a person will have difficulty swallowing. After 15 percent of fluids are lost death is imminent.

If you are in an unexpected survival situation and do not have the means to purify water, Survive Outdoor, Inc. advises: "In the outdoors, it cannot be stressed enough: If you cannot get to a clean water supply, GO AHEAD AND DRINK THE WATER. It is best to re-hydrate yourself, whether from creek, stream or lake. Your survival might depend on it. When you are found and get back to a location where you can be treated, the healthcare professionals can treat your symptoms at that point in time. For example, *Giardia Lambia* is the very common organism that causes diarrhea. The incubation for Giardia is approximately three weeks. You will most likely be found in less time than that, and you are not going to suffer any symptoms until you get back. So, hydration is key. Please drink the water if you are in a situation that warrants that."

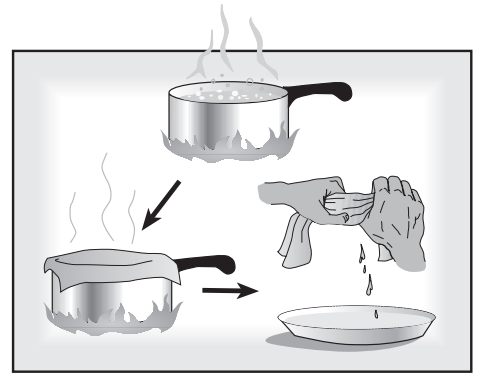
Knowledge is Key in Emergency Survival

Student Information Sheet

Dehydration (continued)

It is important to note two more things:

- Do not eat snow or ice without melting it first because that will lower body temperature and can lead to more dehydration.
- Do not drink seawater without desalting it. If you have fire, you can boil the seawater, catch the steam in a cloth, then wring the water from the cloth to drink it.



Key to Survival: Alaska Native Knowledge:

Find a source of water and stay hydrated.

“If you run out of water you might already be in trouble,” Knutsen says. “You should keep adding snow or ice chips to your water to keep it replenished, and keep your water bottle or bag under your first layer of clothes to help melt the ice or snow and not against your bare skin or it will cause you to lose heat and become hypothermic. If you run out of water look for berries, primarily cranberries as they have a lot of moisture and nutrition in them. They would provide you with all the moisture you need.”

Emergency Kit

An emergency kit can literally be the difference between survival and death. Never leave on a wilderness trip without one. Plan for shelter, fire, water, first aid, food gathering and signaling. Many items have more than one use. For example, an emergency blanket has a reflective side that can be used to signal location. A garbage bag can provide water proofing for a shelter and can be used to collect rainwater. Duct tape can repair clothes, tape garbage bags to make larger waterproofing, bandage over gauze and much more.

Survival experts recommend, at minimum, the following items for an emergency kit:

- Small knife
- 20 ft. of rope or cord
- Whistle
- Lighter/matches in waterproof container
- Flint fire starter
- Flashlight (fresh batteries)
- Mirror
- Fishing line, fishing hooks
- Compass
- Needles and heavy upholstery thread
- Safety pins
- Emergency blanket (reflective)
- Garbage bags
- Quart or gallon-sized freezer bags
- Water purification tablets
- Duct tape (wrap five+ feet around a pen)
- Paper and pencil in waterproof bag
- First aid supplies, including ibuprofen
- Bandanas
- Lip balm
- Small rectangular cooking tin
- A book about emergency survival



Knowledge is Key in Emergency Survival

Student Information Sheet

Emergency Kit (continued)

Alaska Native Knowledge: “You have to be prepared,” Knutsen says. “Be aware all the time. Let someone know where you are going, how long you’re going to be there, when you’re coming back. The most important thing is your mind – being prepared for anything that might come up.”

Knutsen takes a survival kit with him when he travels on the tundra by four-wheeler. Among the things he always takes are a tarp, an ax, a flint and matches, a propane stove, smoked fish, dried meat, a sleeping bag and an extra set of dry clothes, gloves and a fur hat. “There’s nothing better than fur,” he says. “And smoked fish is a staple. Grand Pappy believed that salmon was the best survival food—in any form.”

An ax can be used for chopping wood, but it can also be used for other things, such as digging. “Before there was steel, people would take bone or ivory to use as a digging tool,” Knutsen says.

Signal for Help

Signaling location means searchers can more easily locate a lost or stranded individual, but energy conservation is also important, so experts advise against yelling. A person’s yell will not travel very far, so it is not worth it.

Noise: The international signal for distress calls for sets of three. Blow a whistle three times in quick succession or find another way to make a loud noise in sets of three.

Mirror: Flash a plane or boat using any reflective surface. Again, a set of three is the international signal for distress. Flash three times, wait a minute, then flash three times. Repeat as often as necessary.

Fire: At night the light from a fire can be seen. During the day, the smoke can be seen. Build a signal fire in an open clearing where it will be visible but will not risk starting a forest fire. If space allows, build three fires in a triangular pattern, keeping with the international signal of three.

Debris: Place rocks, branches and other debris in an open area to form a large X or S.O.S.

Alaska Native Knowledge: To start a fire Knutsen says look for very fine, dry material. “If you are around trees, on the spruce trees is a real fine black hair called widow’s hair,” he says. “It’s the best fire starter. At home we have reindeer moss and grass. Use that for fire starter.” Knutsen suggests once you have a fire burning well with the fine tinder, then you can start adding larger pieces.



Name: _____



I'm a Survivor!

Student Worksheet

Directions: Work with a partner or in a small group. Based on what you have learned in this lesson, choose a scenario from those listed below and create a survival plan. You must assume you cannot call for help on a cellular phone or radio and that you are truly stranded in an emergency situation. You do not have an emergency kit. Your plan must:

- Include ways to avoid hypothermia and dehydration;
- Incorporate at least one use of Native Knowledge learned either from the information sheet or the Elder discussion;
- Involve a method of highlighting your location so you can be found.

On a separate paper, restate your choice of scenario then describe your plan. Use illustrations where needed. Be sure to label illustrations.

Scenarios

1. You go for a summer day hike but get disoriented and lose the trail. All you have with you is a daypack with a half-full water bottle, a plant identification book, a baggie with a few adhesive bandages, and an extra sweatshirt. You already ate your snacks. You check all the pockets in the pack and find an old lighter. It looks like it could rain.
2. You are out on a boat off the coast when a storm forces you to shore in a remote area. You have fishing gear, a personal floatation device, a cooler with ice, a rope (which is tied to the boat) and some extra gas for the boat motor in a container. The cooler contains ice, a sandwich and a soda, but mostly you were hoping to use it for the fish you caught. You also found a partial book of matches in small toolbox that contains a screwdriver and wrench. When the storm hit, you got caught in the rain. It is early fall and temperatures are getting cold at night.
3. A tsunami warning signal forces you to evacuate to higher ground in the middle of the night. You must stay until the "all clear" is given. You have nothing with you but the clothes and jacket you are wearing. There are other people from the community doing the same thing and everyone is panicked and frightened.
4. You are out on a snow machine 15 miles from where you started and you are in the middle of the wilderness. It is mid-December so, though it's mid afternoon, the light is fading. It is nearly -10 below. Your snow machine breaks down. In your gear pack you have a flashlight, a towrope, a tin of matches and an emergency blanket. You are also carrying a small gas can that is about half full.

Building a Shelter

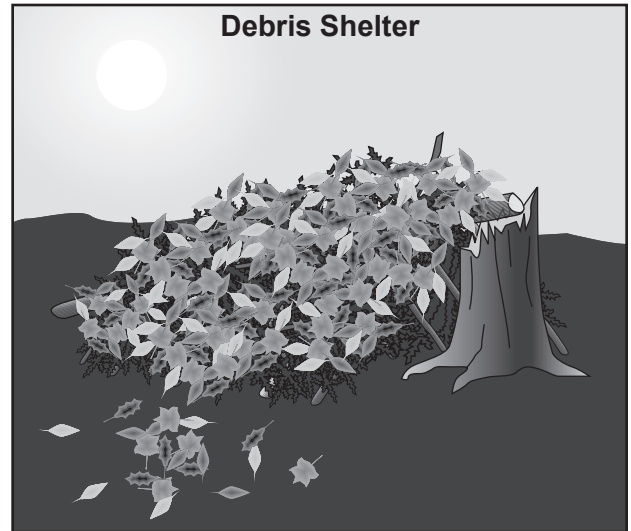
Teacher Information Sheet



Shelter is essential to survival in an emergency situation. The debris hut is a time-tested way to construct a shelter from surrounding materials. The snow hut is an effective winter alternative.

Refer to OVERHEAD: "Building a Shelter." Here are some additional things to keep in mind when building a debris shelter:

- If you cannot find an appropriate place to prop the ridgepole, build it by making a tripod with two shorter stakes and the long ridgepole. Secure the ridgepole about waist high. If needed, use natural ties such as grass and flexible branches.
- When placing sticks to form the ribbing, make sure they form an enclosure wide enough to fit a person inside and steep enough for moisture to run off.
- When adding the debris, thicker is better—two to three feet of debris is great.
- Layer branches and dry grass on the floor of the shelter to provide insulation. Remember, trapped air is good.
- Pile more branches and leaves at the entrance so they can be pulled in to close the entrance once inside. A backpack could also be used to block the entrance.
- If it is windy or a storm is coming, consider adding an additional layer of branches on top of the debris to keep it from blowing away.



Here are some additional things to keep in mind when building a tree pit snow shelter:

- Dig out the snow around a tall tree until the desired depth and diameter are reached, preferably all the way to the ground.
- As the digging proceeds, pack the snow down around the top and the inside of the hole to add support.
- Put evergreen boughs in the bottom of the pit to provide insulation.
- It might be necessary to tie branches together and to stakes in the ground to keep the cover in place. Use natural ties, such as thin, flexible branches. Angle the cover to shed moisture.
- Use extra evergreen boughs as personal cover inside the shelter.



Safety Tip: Never keep food inside a shelter because it will attract wildlife. Hang it from the branch of a tree away from you site.