



Modern Technology in Our Daily Lives

Target grades:

3-5

AK GLEs:

Science

[3/5] SE1.1

[3] SE2.1

[3/5] SE3.1

History

AH. CC 1

Cultural

A 6

B 2,3,4

Set up time:

15 minutes

(additional time to gather any materials on traditional technology or students could participate in gathering these materials when visiting the library)

Class time:

One class period

Overview:

Students compare traditional methods and dated technology with modern technology to consider the benefits and drawbacks of each.

Objectives:

Students will explore historic ways of using and conserving energy, understand how our energy consumption patterns have changed throughout history, and identify ways that our modern technologies can become more efficient.

Materials:

Markers

Blank paper

Modern_Technology_in_Our_Daily_Lives.ppt Powerpoint presentation
Projector or Smartboard (or have the slides printed out)

Background:

Humans have been using energy since the beginning of time. We used fire to heat our homes and to cook our food. We used our own human power for transportation, hunting and fishing. These older forms of energy are still around and used in many communities throughout Alaska. However, with the discovery of fossil fuels and advancements in technology, our energy consumption has skyrocketed, and our lifestyles and communities have been transformed. Some of the greatest changes have occurred to our forms of transportation and in the ways that we build shelters, heat our homes, and dress and feed ourselves.

Food: Before grocery stores, people preserved food by smoking, drying and canning. In Alaska, harvesting food from the land, rivers, and seas was the primary, if not only, way that people acquired food. People picked berries and greens, and they fished and hunted for sea and land animals to provide food for their families. People traveled in human-powered boats and dog-sleds or walked in order to hunt, fish, and harvest food. They smoked or dried food to store it for winter, using the air and fire in a natural method of preserving food. Many people in rural and urban parts of Alaska still practice subsistence harvesting and food preservation; however, the majority of people get their food from stores. This food has often traveled thousands of miles on



planes, barges and trucks in order to make it onto the store shelves in Alaska. Large quantities of fossil fuels are used to produce and transport these foods and to store them in grocery stores.

Shelter: Traditional shelters in Alaska were made from local natural materials. In Southeast Alaska, people built homes out of wood. In other parts of the state, such as western Alaska, people built homes out of sod from the tundra. Many traditional homes were subterranean to take advantage of the ground's natural insulation. Most houses were small to limit the amount of space that required heating and, as a result, were energy efficient. The designs and construction materials of our modern homes are drastically different. Our homes are significantly larger, requiring the use of fossil fuels for heat and electricity. Frequently, they are made from materials that did not originate in Alaska and therefore require building supplies to be shipped from thousands of miles away. Many homes are poorly insulated and not designed to withstand the harsh Alaska winters which requires more heat to keep them warm. Additionally, some homes are drafty and allow heat to escape.

Transportation: Before the arrival of cars, airplanes, snow machines, 4-wheelers, and gas powered boats, people in Alaska still traveled great distances to visit people and harvest food. Traditionally, they used wooden or skin boats, kayaks and dog teams for transportation. These modes of transportation were made from local natural resources and were powered by people and animals. They did not require a drop of fossil fuel to move them! However, modern forms of transportation are heavily dependent on fossil fuels that are shipped from thousands of miles away.

Heating: Heat is a very important need for Alaskans. We cannot survive Alaska's long, cold winters without heat to keep us warm. Traditionally, most houses were heated with wood heat or oil lamps from the fat of seals and other sea mammals. These heat sources were renewable, and due to the small size and efficiency of homes, heat resources were used wisely. The introduction of fossil fuels drastically changed how we heat our homes. In addition to traditional wood heat, today Alaskans use natural gas, coal, and diesel to heat our homes. Not only does this mean we are using a nonrenewable resource for heat, but it is also expensive!

Clothing: Traditional clothing in Alaska was tailored for the cold and made out of local resources. The skin, fur, and feathers of local animals, such as beaver, bears, caribou, seals, and birds provided insulation and warmth during Alaska's cold winters. Although Alaskans still sew traditional clothing using the skin and fur of animals, most of our clothing is now store-bought and made of synthetic materials. These materials were produced thousands of miles away and are expensive to buy. They do a great job at keeping us warm in Alaska, but they come with significant financial and environmental costs.

Personal amenities: In addition to changes to food, shelter, transportation, heating, and clothing, modern technology has introduced an array of additional items that we use regularly in our daily lives: items such as computers, cell phones, iPods, video games, hair dryers, and televisions. These items provide great convenience and entertainment in our daily lives. However, all of these



items use energy.

Vocabulary List:

conserve - to save, protect, or use carefully; to avoid wasting or destroying.

energy - the ability of a system to do work; this might refer to either potential or kinetic energy. Potential energy (stored energy) includes chemical, mechanical, nuclear, and gravitational energy. Kinetic energy (motion energy) includes radiant, thermal, motion, sound, and electrical energy.

energy conservation - reducing energy use through a behavior change that results in not using energy at a time when one might normally. For example, riding a bike instead of driving a car, unplugging computers and other electronics at night or when not in use, or turning off the lights when you leave a room.

energy efficiency - reducing energy use through an improvement in technology that makes an existing use of energy more efficient, i.e. allows us to do more with less. Examples of energy efficiency include replacing incandescent light bulbs with compact fluorescents (CFLs) or LEDs, adding extra insulation to a house, or using Energy Star® appliances that have power-saving measures installed.

modern - characteristic of the present or the recent past.

technology - machinery and/or equipment developed through or improved upon by application of science knowledge.

traditional - characteristic of being long-established or handed down through generations.

Gear Up:

Introduce the idea to your students that our energy use in Alaska has changed significantly throughout history. Review the six topics listed above by going through the *Modern Technology in Our Daily Lives* Powerpoint presentation. Ask your students whether the images of specific technology are commonly used in the past, in the present, or both. Talk to the students about how Alaskans were traditionally reliant on local and renewable resources and provide examples from the background information. Next, discuss with the students how and why modern technology has replaced many of our traditional technologies and practices. Discuss how we have gained many benefits from modern technologies, but how they also have many consequences in terms of the amount of energy we demand and consume.

Activity:

Divide the class into groups of 3-4 students. Assign each group one topic from the following: food, shelter, transportation, heating, clothing and personal amenities. In their individual groups, ask the students to brainstorm the different ways that they use their topic in their daily life and think about the modern ways these things are produced, built, consumed and used.



Have the students think about how our modern technologies use energy differently than traditional technologies and practices. For example, the transportation group can think about how our modern modes of transportation (e.g. airplanes, cars, buses) differ from traditional modes of transportation (e.g. human powered boats, dogsleds) in terms of energy use, pollution and efficiency.

Have the students create posters to illustrate their ideas. They can draw and/or use pictures from magazines and newspapers. Additionally, have each group answer the following questions:

1. How do we depend on your topic in our daily lives? (e.g. transportation for jobs and to get to school)
2. In what ways has our energy consumption changed with modern technology? How would our life be different without modern technology?
3. What are the benefits and limitations of the traditional technologies and practices?
4. What are the benefits and limitations of modern technologies?
5. How can we use these modern technologies more efficiently?

Have each group of students present their findings to the class.

Extension:

1. Students can interview community elders about how technology has changed during their lifetime. What are some of the “Old Ways” of doing things? Did they require less energy (or possibly more human energy)? What are the advantages of the “Old Ways”? Disadvantages?
2. Have students brainstorm how they think technology will change over their lifetime. Will they become more dependent or less dependent on energy? How might their energy needs change in the future?

Additional Resources:

Alaska Native Heritage Center

A cultural center and museum located in Anchorage that focuses on expanding understanding of Alaska’s Indigenous people.

<http://www.alaskanative.net/>

Alaska Native Knowledge Network’s Village Science

This resource provides activities and lessons that relate to skills, tools, travel and shelter and capture day-to-day living in rural Alaska.

<http://ankn.uaf.edu/Publications/VS/>



Traditional Lighting

This lesson plan from the Alaska Native Knowledge Network provides an experiment for students to explore traditional methods of lighting and lamps.

http://www.ankn.uaf.edu/publications/alaska_science/TradLight.html

Traditional Native Alaskan Fishing Technology from U.S. Fish and Wildlife Service

This website shows pictures of different traditional Native Alaskan fishing technology.

<http://cybersalmon.fws.gov/fishmeths.htm>

Shell Oil: History of Energy

This website provides an interactive timeline of how humans have used energy throughout history, from wood to coal to fossil fuels.

http://www.shell.us/home/content/usa/environment_society/education/student/energy_timeline/

Missouri Department of Natural Resources

Your Energy Path for A Day is an activity where students will compare their modern day activities with the ways people used energy in the past.

http://www.dnr.mo.gov/education/energy/energy_path.pdf

The Franklin Institute

This website provides a history of energy.

<http://www.fi.edu/learn/case-files/energy.html>

Alaska Cooperative Extension Food Preservation

This website has information about how to preserve food.

<http://www.uaf.edu/ces/foods/preservation/>

Alaska Grade Level Expectations addressed:

Science Performance Standards

The student demonstrates an understanding of how to integrate scientific knowledge and technology to address problems by:

[3] SE1.1 identifying local problems and discussing solutions.

[5] SE1.1 identifying a community problem or issue and describing the



information needed to develop a scientific solution.

The student demonstrates an understanding that solving problems involves different ways of thinking, perspectives, and curiosity by:

[3] SE2.1 identifying local tools and materials used in everyday life.

The student demonstrates an understanding of how scientific discoveries and technological innovations affect our lives and society by:

[3] SE3.1 listing the positive and negative effects of a single technological development in the local community (e.g., fish trap, fish wheel, four-wheeler, computer).

[5] SE3.1 describing the various effects of an innovation (e.g., snow machines, airplanes, immunizations) on the safety, health, and environment of the local community.

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Alaska History Standards

The student demonstrates an understanding of the chronology of Alaska history by:

AH. CC 1 using texts/ sources to recognize and explain the interrelationships among Alaska, national, and international events and developments (e.g., international interest, trade, commerce).

Alaska Cultural Standards

A) Culturally knowledgeable students are well grounded in the cultural heritage and traditions of their community. 6) live a life in accordance with the cultural values and traditions of the local community and integrate them into their everyday behavior.

B) Culturally knowledgeable students are able to build on the knowledge and skills of the local cultural community as a foundation from which to achieve personal and academic success throughout life.:

2) make effective use of the knowledge, skills, and ways of knowing from their own cultural traditions to learn about the larger world in which they live;

3) make appropriate choices regarding the long-term consequences of their actions; and

4) identify appropriate forms of technology and anticipate the consequences of their use for improving the quality of life in the community.



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