

Fabulous Food and Fiber

Summary: Students explore the concepts of food and fiber and identify such products from Pennsylvania farms.

Objectives:

The students will:

- Define food.
- Define fiber.
- Identify a food product from Pennsylvania.
- Identify a fiber product from Pennsylvania.

Materials:

Activity #1:

- map of Pennsylvania (can copy and enlarge from map in Appendix)
- food resource cards or pictures (can use resource graphics from Appendix)
- masking tape

Activity #2:

- 8-10 boxes or containers that students can reach into and feel, but not see, examples of raw fibers
- examples of natural raw plant fibers such as cotton, flax (linen), jute, ramie, and hemp
- examples of natural raw animal fibers such as wool, angora, mohair, cashmere, and silk
- hand lenses
- paper and crayons/colored pencils

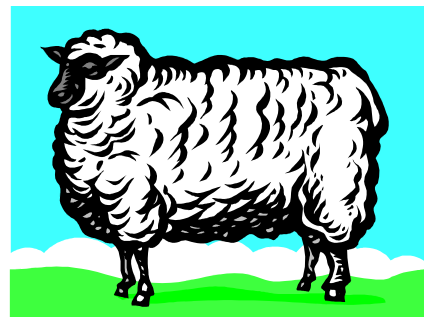
Activity #3:

- the examples of natural raw plant and animal fibers from Activity #2
- examples of clothing made from these many different fibers (cotton, linen, wool, angora, silk, cashmere, ramie, acrylic, polyester, etc.) to show the students
- hand lenses
- construction paper
- glue
- scissors
- scraps of a variety of different fabrics (different fibers, textures, colors, etc.) for an art project

Getting Started:

Activity #1:

- Decide if each student will get a map or if you will use one group map and enlarge the copy so that it is big enough for the group to see.
- Photocopy the map of Pennsylvania from the Appendix.
- Photocopy the food resource graphics from the Appendix: mushrooms, grapes, tomatoes, soybeans, sweet corn, apples, dairy cow (one set for the group map or one set for each student if they are each doing a map).



Grade Level: K-6

Topic: Food and fiber products

PA Environment & Ecology Standards Addressed:

Agriculture and Society:

4.4.4.B: Identify the role of the sciences in Pennsylvania agriculture.

- Identify a fiber product from Pennsylvania farms.

4.4.4.C: Know that food and fiber originate from plants and animals.

- Define and identify food and fiber.

Teaching Methods:

- Lecture/Discussion
- Hands-on activities
- Investigation

Multiple Intelligences Utilized:

- Naturalistic
- Visual/Spatial
- Interpersonal
- Intrapersonal
- Bodily/Kinesthetic

Activity #2:

- Gather 8-10 boxes or containers (old shoe boxes, cardboard milk containers, paper grocery bags, etc.) that you could set up so that the students can put their hands in to feel a piece of fiber but not see what it is. For example, if using shoeboxes, cut a hole in the side through which for them to reach and then tape the lid shut after placing the fiber specimen in the box. You could even drape a cloth over the box so that they cannot peek through the hole. This also adds drama.
- Find raw plant and animal fibers as listed above. Some will be easier than others. If you cannot find raw specimens, (such as hemp, which is highly likely), a product made from hemp, such as hemp rope can be substituted. Look in sewing specialty stores and check with local farmers for animal fibers.
- Gather hand lenses.

Activity #3:

- Ahead of time, gather old scraps of fabric from friends who sew and from old clothing that doesn't fit anymore. The students will be cutting it to use in an art project. Some materials, like cashmere, will be hard to come by, but you might get lucky and find someone who is willing to sacrifice a garment that is ruined for the cause.
- Also, go around your house and see if you can find pieces of clothing that are made from cotton, linen, wool, silk, cashmere, ramie, angora, acrylic, and polyester. You will use these to show the students.

Background:

What is food? Technically, it is the materials taken into an organism and used for growth, repair, and vital processes, and as a source of energy. It is also an organic material produced by green plants and used by them as food. More simply, it could be explained as the fuel that we put into our bodies to keep them functioning. Think of a car--it would not run without gasoline, and our bodies are the same way.

Can you name some of the main food crops that are grown in Pennsylvania? There are many farms in Pennsylvania producing many of the foods we eat such as grapes, apples, pumpkins, oats, soybeans, mushrooms, sweet corn, tomatoes, and milk, just to name a few.

What is fiber? Fiber can be classified as a threadlike substance or structure (as a muscle or a fine root), especially a natural (as in wool or flax) or artificial (as in rayon) filament capable of being spun or woven. Fiber is also indigestible material in human food that stimulates the intestine to move its contents along, or an element that gives texture or substance.

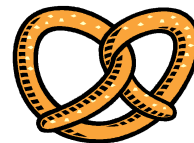
There are many types of natural fibers that are used to make different kinds of cloth, which are then used to make clothing and other useful items. Some of the fibers come from animals and others come from plants. Wool, from sheep, is made into yarn and then spun into cloth. Animal hair is covered with scales and absorbs moisture, so the wool

fibers can hold more moisture away from your skin. As a result, this makes you feel warmer because you stay drier. Angora rabbits provide some of the finest, lightest, and warmest of all fibers. It is so warm because it is fluffy, and the fluff leaves air spaces between the fibers, which trap the warmth of your body in.

Llamas, alpacas, guanacos, and vicunas are all animals originally from the Andes region of South America that produce hair and fur that can be woven into cloth for knitwear. Angora goats produce a white hair called mohair that is like wool but softer, and Kashmir goats produce cashmere which is a luxurious, very soft fiber from which sweaters, dresses, and scarves are made. Silk comes from the large white moth caterpillar (commonly called the silkworm). Its cocoon that it built with long, continuous fibers is unwound to produce fine threads, which are used to weave silk cloth.

Some natural fibers that are produced from plants are cotton, linen, jute, ramie, and hemp. Cotton is a major crop in the United States. Though it is not grown in Pennsylvania because it grows best in warmer climates, more things are made of cotton than any other fiber. This is because it costs less to harvest cotton fibers than others that are used to make cloth, and cotton is also absorbent, soft, lightweight, stretchy, and fast-drying. The United States is second only to China in raising cotton in the world. Linen is made from the fibers of the flax plant and is one of the world's oldest fabrics. It is used for making clothing, tablecloths, lace, twine, bags, and fire hoses. Jute is a natural plant fiber that is used to make useful items such as burlap sacks, bags, carpet pads, cloth, and rope.

Ramie is an ancient fiber-bearing plant that comes from China grass. The raw fiber is coated with gum that must be removed, which can be challenging to do without damaging the fiber, but ramie is twice as strong as flax and seven times as strong as wool and blends well with other fabrics, so it can be a useful product. Hemp is a strong, durable fiber that is used to make robes, cords, string, twine, and coarse fabrics like sacks and canvas. U.S. cultivation requires a government permit because two illegal drugs can be obtained from hemp plants.



Activity #1: Find Your Food

- This activity incorporates some Pennsylvania geography skills practice with learning where some key foods are produced.
- Using the Pennsylvania maps and food resource graphics from the Appendix, ask students to place the different food resources on the map according to where they are grown. The foods are mushrooms, grapes, tomatoes, soybeans, sweet corn, apples, and milk. Some, like grapes, would obviously go in the northeast part of the state. However, many of the others are

grown in various places, so there is no exact science to this activity. You could decide to do some research, as a group, in order to find out more about each resource.

- Talk about each food and if the students have eaten them before and in what form. They have all eaten soybean oil before but probably didn't know it! Why do these foods grow well in Pennsylvania? Why are dairy cows raised in Pennsylvania?

Activity #2: Feel That Fiber

- Before introducing the natural plant and animal fibers to the students, ask them to reach into several "feely" boxes that each have an example of each type of fiber that you are going to discuss. Ask them to describe what each specimen feels like.
- One by one, introduce examples of natural plant fibers such as cotton, flax (linen), jute, ramie, and hemp. Discuss the characteristics of each and products that can be made from each.
- Next, do the same with natural animal fibers such as wool, angora, mohair, cashmere, and silk.
- Compare the differences between plant and animal fibers.
- View the specimens under hand lenses or microscopes and have the students draw pictures of what the fibers look like up close.
- Place the specimens back into the boxes and challenge the students to identify the fibers by touch and memory.

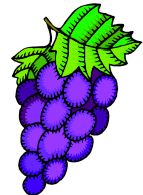
Activity #3: Fashionable Fibers

- What are our clothes made of?
- Discuss sources for clothing: natural fibers (derived from plants and animals) and manmade fibers.
- How does fiber become fabric? Follow the process from start to finish (ex.= Wool: follow it from the time that it is sheared from the sheep through to the factory where it is made into clothing or household goods and then shipped to stores to be bought by the consumer).
- Compare the raw fibers to the corresponding clothing of the same fiber (ex.=look at a bunch of raw wool and a wool sweater). Can you see any similar characteristics or does the fiber change drastically once it has been woven into fabric? Inspect the two examples with hand lenses.
- Make fabric collages using scraps of material, scissors, glue, and construction paper. Students could make abstract designs or if they are using more wool than any other material, they could make a picture of a sheep or sweater, or something that represents the fiber that they have chosen.



Extensions/Variations:

- **Activity #1:** Assign each student the task of researching a Pennsylvania food product. Then have them give a short presentation on some of the facts that they found about their food.
- **Activity #1:** Have a buffet of Pennsylvania food products to taste. Also, try to come up with several different recipes for one food and make them in order to see the variety of dishes that one food can make (ex.=applesauce, applebutter, apple pie, apple cake, etc.).
- **Activity #3:** Ask students to draw the "fiber to fabric" process after you have researched and discussed it in class together. Have them explain their drawings to the class. You could even create a class mural.
- **Activity #3:** Ask students to take the "fiber to fabric" process one step further and research a fiber of their choice. Have them follow a fiber from its origin to the consumer and then explain the process to the class. They could write a short report or illustrate their findings.



Evaluation

Rubric: Fabulous Food and Fiber

3	2	1	0	The student can define the term "food."
3	2	1	0	The student can define the term "fiber."
3	2	1	0	The student can identify at least three food products from Pennsylvania.
3	2	1	0	The student can identify at least two fiber products from Pennsylvania.
12	8	4	0	Total Score: /12

Resources:

Adler, I. & Adler, R. (1964). *Fibers*. The John Day Company: NY.

Selsam, M. (1982). *Cotton*. William Morrow and Company: NY.