

Clothesline Sleuth

Background

Oklahoma agriculture does more than just feed us. It also puts clothes on our backs. Your blue jeans and T-shirts are made from cotton fibers which grow in the boll, or seed pod, of the cotton plant. Cotton, a product of Oklahoma agriculture, is the most common natural textile in use today. In 2000, Oklahoma cotton fields produced 122,000 bales of cotton. A bale is about the size of a refrigerator and weighs about 500 pounds. Most Oklahoma cotton is grown in the southwestern part of the state, especially in Jackson and Harmon Counties.

Most wool is produced by sheep. In 2000 there were 45,000 sheep raised for wool in Oklahoma. They produced 275,000 pounds of wool. The largest numbers of sheep and lambs are produced in north central Oklahoma, especially in Garfield and Grant Counties. Some farmers also grow llamas for their wool. Mohair is softer than wool and is made from the hair of goats. Some farmers in Oklahoma grow goats for their mohair.

Linen is made from the stalks of the flax plant. Most of the flax grown for linen is grown in European countries like Russia, France, the Netherlands and Ireland. Flax grown in the US is produced mostly for its seed. Linseed oil used for making linoleum and many other products comes from flaxseed.

You can find out what your clothes are made from by looking at the garment's label. By law each garment must be labeled to show the generic name of the fabric from which the garment is made, the percentages of fibers present, the manufacturer's name or registered identification number, the country where the garment was made and instructions for caring for the garment. Sometimes this information will be on more than one label.

Most fabrics are made from yarns that are formed by twisting or spinning many fibers together. The more the fibers are twisted, the stronger the yarn will be. Besides clothing, fibers are also used for making toothbrushes, tires, tea bag strings, mops, tents, baseballs, fishing line and many other things you use every day.

Language Arts (Research)

1. String a cotton cord across the top of a blackboard to resemble a clothesline.
 - Bring a variety of clothing articles to class made from a variety of fabrics, both natural and synthetic.
 - Use clothespins to hang all the clothes on the clothesline.
 - Read background, and lead a discussion of the origins of fabrics.

P.A.S.S.

GRADE 3

Reading—2..1,4; 3.2; 6.1b

Writing—2.1

Oral Language—3.2

Social Studies—1.1

Math Process—5.2

Math Content—5.1abc

Science Process—1.2; 3.2

Physical Science—1.1

GRADE 4

Reading—1.4b; 2.3;

5.1a,2cd

Writing—2.4

Oral Language—1.1,2,3;

3.2

Social Studies—2.2

Math Process—5.2

Math Content—5.1ab,3

Science Process—1.2; 3.3

GRADE 5

Reading—1.4b; 2.4; 3.3d;

5.1a

Writing—2.1

Oral Language—3.2

Social Studies—7.1

Math Process—5.2

Math Content—5.1a,3

Science Process—1.2; 3.3

Materials

quilting magazines or
quilting books

construction paper

glue

scissors

tag board, cardboard or
other heavy paper

- Divide students into groups of four or five.
- Assign one article of clothing from the clothesline to each group.
- Students will study the garment label and determine what the garment is made from.
- Students will use online search engines and library resources to gather information about the material from which the garment is made.
- Students will answer the following questions as they research the garment:

What raw materials were used to make this material?

Is this a natural or synthetic material?

Is this a material that is grown in Oklahoma?

If not in Oklahoma, where is this material produced?

What process is used to produce this material?

- Each group will divide the questions among group members.
 - Group members will prepare written reports on their assigned questions.
 - Each group will combine reports of members to present a group report to the class.
 - As each group makes its report, one group member will hang the article of clothing back on the clothesline.
 - Hang your clothesline, with garments, in the hallway, along with information about each garment's origins.
2. Hand out student worksheets.
- Students will read the information printed on Student Worksheet A.
 - Students will match the definitions to vocabulary words on Student Worksheet B.
 - Students will look in the dictionary for words they were unable to identify.
 - Students will use dictionaries, encyclopedias and Student Worksheet A to answer the questions on Student Worksheet C

Social Studies (Geography)

1. Students will look for the countries of origin on the labels of the clothes they are wearing.
- Students will locate the countries on a world map.
 - Students will list the countries on the chalkboard.
 - Students will place a tally mark next to each country listed for every item of clothing that comes from that country.

Science (Observe, Compare/Contrast, Investigate)

1. Bring samples of cotton bolls and raw wool to class.
- Students will pull fibers from these raw materials and twist them into yarns.
 - Students will compare the fibers of wool with the fibers of cotton.
 - Students will plan and conduct investigations, using the cotton bolls and raw wool or other textiles.

Math

1. Students will create graphs to show the percentage of fibers in clothing made with blended fabrics (e.g., 50 percent cotton, 50 percent polyester).

Extra Reading

Ballard, Carol, *Grouping Materials: From Gold to Wool*, Heinemann, 2003.

Gleason, Carrie, *The Biography of Cotton*, Crabtree, 2005.

Gleason, Carrie, *The Biography of Wool*, Crabtree, 2007.

Gunderson, Jessica, and Jerry Acerno, *Eli Whitney and the Cotton Gin*, Capstone, 2007.

King, Hazel, *Fabric Types*, Heinemann, 2001.

Moore, Heidi, *The Story Behind Cotton*, Heinemann Library, 2009.

Nelson, Robin, *From Cotton to T-Shirt*, Lerner, 2003.

Storey, Rita, *Wool and Cotton*, Smart Apple, 2007.

Ag in Your Community

1. If you have a sheep rancher in your area, invite him or her to your class to discuss the production of wool.
2. Have a 4-H or FFA student bring a lamb to school. If it is time to shear, arrange to have students participate in the shearing.
3. Invite a local quilting club to visit your classroom and bring quilts to show students.
4. Contact your county OSU Extension office (listed under county government in the telephone directory) to invite members of local Home and Community Education clubs to teach students simple sewing skills, e.g., chain stitch, crochet, knitting, sewing a pillowcase, etc.
5. Invite someone with a spinning wheel to demonstrate fiber to yarn.

Clothesline Sleuth

Read the information below, and use it to match the vocabulary words to their correct definitions on Student Worksheet B. Then answer the questions on Student Worksheet C.

Your jeans, shirts, socks and sweaters are all made from *textiles*. Some textiles are made from the *natural fibers* of plants and animals. *Cotton* is made from fibers gathered from the seed pod or *boll* of the cotton plant. *Wool* fabric is made from the wool of sheep and *llamas*. *Mohair* is made from the long hair of goats. *Silk* comes from the long threads the silkworm produces when it weaves its cocoon. Other textiles are made from *synthetic fibers*. Synthetic fibers are produced from chemicals, usually *petrochemicals*.

Up until the 20th Century all textiles were made from natural fibers. Since natural fibers decompose over time, very little evidence has survived to show what kinds of clothing people wore many thousands of years ago. The earliest known textiles were *linen*. Linen is made from the fibers of the *flax* plant. In Switzerland *archaeologists* dug up bundles of flax fibers and yarns and pieces of *woven* linen fabric. They think these objects are about 7,000 years old. In Mesopotamia they found wool fabrics that were about 4,000 years old. *Cotton* was first used for clothing in India, Egypt, China, Mexico and Peru. *Silk* has been used in China for over 4,000 years.

Late in the 19th Century scientists started trying to imitate silkworms by inventing a

fiber that was similar to silk. In 1884, the French inventor Hilaire de Chardonnet invented *rayon*, the first synthetic fiber. Rayon is made from wood pulp that has been chemically treated. *Nylon* was the first fiber made completely from chemicals. In the production of nylon and other synthetic fibers, certain products of oil refining are combined into a syrupy substance and forced through the tiny holes of a plate called a *spinneret*.







Today, textiles are made from both natural and synthetic fibers. Sometimes natural and synthetic fibers are blended together. The most commonly-used plant fiber is cotton. Cotton is a major Oklahoma crop grown on farms in the southern part of the state. The short, fluffy fibers of the cotton boll must be separated from the seed before they can be used. This was difficult until Eli Whitney invented the *cotton gin* in 1793. The cotton gin made it easier and faster to clean cotton after it had been picked. After that, people all over the United States and Europe began wearing clothes made from cotton.

Before the invention of the cotton gin, most people wore clothes made from wool or linen. The cotton gin made cotton production more economical than wool or linen production.

Name _____

Clothesline Sleuth

Read the information on Student Worksheet A. Then match the words with the definitions by writing the correct number in the space provided.

- _____    _____  _____  _____ 
1. cotton gin ___ Fibers obtained from plants or animals.
 2. petrochemicals ___ Fibers made from chemicals rather than natural sources.
 ___ A plant grown in warm climates for the fibers surrounding their seeds.
 3. yarn ___ A machine that separates the seeds, seed hulls and other small objects from the
 fibers of cotton.
 4. rayon ___ A woven fabric made from the inner bark of the flax plant.
 5. natural fibers ___ A plant grown for its fiber, used in making linen, and for its seed, used to make
 linseed oil.
 7. textiles ___ A continuous strand of twisted threads of natural or synthetic materials.
 ___ A synthetic fiber produced from wood pulp that has been chemically treated.
 8. spinneret ___ The fine, soft, wavy, protective coat of domestic sheep and certain other ani-
 mals.
 9. archaeologist ___ South American animal related to the camel and raised for its soft, fleecy wool
 and as a beast of burden.
 11. llama ___ Chemicals made from petroleum products.
 12. synthetic fibers ___ A plate pierced with holes through which plastic material is pushed to produce
 synthetic fibers.
 13. linen ___ Cloth made by interlacing yarns on a loom.
 14. woven ___ Fabric that is woven or knitted.
 ___ The rounded seed pod of the cotton plant.
 15. cotton boll ___ Someone who looks for and studies material evidence from past human life and
 culture.
 16. flax

Name _____

Clothesline Sleuth (Answers)

Read the information on Student Worksheet A. Then match the words with the definitions by writing the correct number in the space provided.

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1. cotton gin 5 _Fibers obtained from plants or animals.
2. petrochemicals 12 _Fibers made from chemicals rather than natural sources.
3. yarn 6 _A plant grown in warm climates for the fibers surrounding their seeds.
4. rayon 1 _A machine that separates the seeds, seed hulls and other small objects from the fibers of cotton.
5. natural fibers 13 _A woven fabric made from the inner bark of the flax plant.
6. cotton 16 _A plant grown for its fiber, used in making linen, and for its seed, used to make linseed oil.
7. textiles 3 _A continuous strand of twisted threads of natural or synthetic materials.
8. spinneret 4 _A synthetic fiber produced from wood pulp that has been chemically treated.
9. archaeologist 10 _The fine, soft, wavy, protective coat of domestic sheep and certain other animals.
10. wool 11 _South American animal related to the camel and raised for its soft, fleecy wool and as a beast of burden.
11. llama 2 _Chemicals made from petroleum products.
12. synthetic fibers 8 _A plate pierced with holes through which plastic material is pushed to produce synthetic fibers.
13. linen 14 _Cloth made by interlacing yarns on a loom.
14. woven 7 _Fabric that is woven or knitted.
15. cotton boll 15 _The rounded seed pod of the cotton plant.
16. flax 9 _Someone who looks for and studies material evidence from past human life and culture.

Name _____

Clothesline Sleuth

Read the information on Student Worksheet A to answer the following questions.

1. Cotton was first used to make clothing in what five countries? _____

Find these countries on a world map.

2. What invention helped make cotton more important than linen or wool as a material used to make clothing? _____

3. Find Switzerland on the world map. Archaeologists have found the first evidence of which fiber in Switzerland? _____

4. How many years old do archaeologists think this material is? _____

5. Look up Mesopotamia in an encyclopedia. Name the country that is located where Mesopotamia once was located. _____

6. Find that country on the world map. Archaeologists found the first evidence of which fiber in Mesopotamia? _____

7. Scientists were trying to imitate what when they first began developing synthetic fibers? _____

8. A spinneret is a plate filled with holes used for making synthetic fibers. The chemical substance is pushed through the holes to form threads. Spinneret is also the name for a part on the body of some insects. Look in the dictionary to find out what part of the insect's body it is. _____

9 What does the insect use it for? _____

10 Why do you think scientists decided to give this name to the device used for making synthetic fibers? _____

11. Look up the words "alpaca" and "vicuna" in the dictionary or encyclopedia. What do these animals have in common with the sheep and llama? _____

12 Look on the map to find where each of these animals lives. _____

Name _____

Clothesline Sleuth (answers)

1. Cotton was first used to make clothing in what countries? Cotton was first used to make clothing in India, Egypt, China, Mexico and Peru. Find these countries on a world map.
2. What invention helped make cotton more important than linen or wool as a material used to make clothing? The cotton gin helped make cotton more important than linen or wool as a material used to make clothing.
3. Find Switzerland on the map. Archaeologists have found the first evidence of which fiber in Switzerland? Archaeologists have found the first evidence of linen fibers in Switzerland.
4. How many years old do archaeologists think this material is? Archaeologist believe the linen fibers they found in Switzerland are 7,000 years old.
5. Look up Mesopotamia in an encyclopedia. Name the country that is located where Mesopotamia once was located. Iraq is located in the area once covered by Mesopotamia. 6. Find that country on the world map. Archaeologists found the first evidence of which fiber in Mesopotamia? Archaeologists found the first evidence of wool fiber in Mesopotamia.
7. Scientists were trying to imitate what when they first began developing synthetic fibers? Scientists were trying to imitate the silkworm when they first began developing synthetic fibers.
8. A spinneret is a plate filled with holes used for making synthetic fibers. The chemical substance is pushed through the holes to form threads. Spinneret is also the name for a part on the body of some insects. Look in the dictionary to find out what part of the insect's body it is. Spinneret is the name for the back end of the body of some insects.
9. What does the insect use it for? Some insects secrete silky filaments with the spinneret.
10. Why do you think scientists decided to give this name to the device used for making synthetic fibers? The device used for making synthetic fibers is called a spinneret because scientists used it to imitate the process the silkworm uses to make silk.
11. Look up the words "alpaca" and "vicuna" in the dictionary or encyclopedia. What do these animals have in common with the sheep and llama? The alpaca, vicuna, sheep and llama all have wool covering their bodies.
12. Look on the map to find where each of these animals live. Sheep live all over the world. Llamas, alpaca and vicuna are from South America.