



# CLOTHESLINE SLEUTH

**GRADE LEVEL:** 4-5

**SUBJECT:** Language Arts

**NATIONAL STANDARD(S):**

(3-5) LA: 5.2, 5.3, 5.6, 5.8, 6.1, 9.1, 9.2, 10.1

**THEME:** Textiles

**FOOD AND FIBER TOPIC:** I-B,C,D,E; II-E

**LEARNER OBJECTIVES:**

Students will trace origins of various forms of clothing to their agricultural sources.

## VOCABULARY

***boll***—The fruit of a cotton plant which contains the seeds of the plant.

***cotton bales*** —Bound package of compressed cotton lint averaging 500 pounds.

***fibers***—Elongated elastic cells of plants which are tapered at each end and serve various functions in the plant. Plant fibers can be harvested and processed into textiles.

***llamas***—South American animal related to the camel and raised for its soft wool and as a beast of burden.

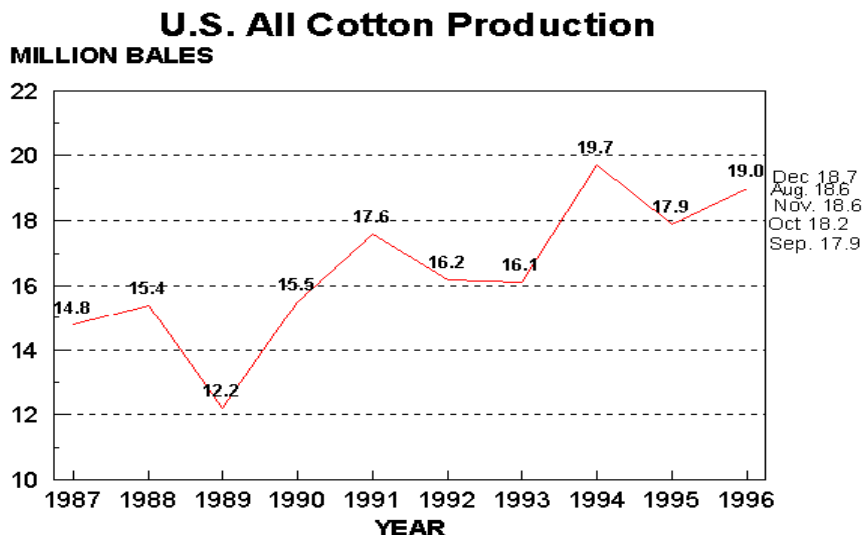
***mohair***—Long lustrous hair from angora goats used for producing high quality textiles.

***textile***—Fabric that is woven or knitted.

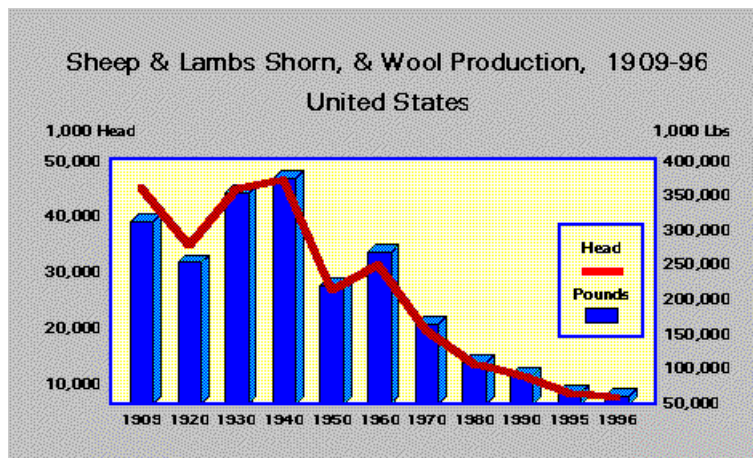
***wool***—The soft, wavy fiber that forms all or part of the protective coat of domestic sheep and certain other animals.

## BACKGROUND

Our country's agricultural products do more than just feed us. Agricultural products also put clothes on our backs. Blue jeans and many T-shirts are made from cotton ***fibers*** which grow in the ***boll***, or seed pod, of the cotton plant. Cotton is grown in many southern and some western states and is the most common natural ***textile*** for use in fabric today. In 1996, the United States produced about 19 million ***bales*** of cotton. A bale is about the size of a refrigerator.



Most *wool* used in making commercial goods is produced by sheep and lambs. *Enclosed in parentheses is statistical information for enhancing the lesson:* [According to the National Agricultural Statistics Service (<http://usda.mannlib.cornell.edu/usda/>), 1996 Wool Production was down 11 percent. Shorn wool production in the United States during 1996 was 56.7 million pounds, down 11 percent from 1995. Sheep and lambs shorn totaled 7.28 million head, a decrease of 11 percent from 1995. The average price paid for wool sold in 1996 was \$0.70 per pound for a total value of \$39.7 million, down 38 percent from \$64.3 million in 1995. Mohair production in the four major producing states (Arizona, New Mexico, Oklahoma, and Texas) during 1996 was 8.05 million pounds, down 33 percent from 1995.]



*Mohair* is softer than wool and is made from the hair of goats. [Goats and kids (juvenile goats) clipped, at 1.20 million head, was down 26 percent from 1995. Average weight per clip was 6.7 pounds compared with 7.4 pounds a year earlier. Value of mohair production was \$15.5 million, down 30 percent from 1995.] Some farmers also raise *llamas* for their wool. The wool from llamas is considered very high in quality compared to sheep's wool.

You can find out what your clothes are made from by looking at the garment's label. According to clothing production regulations, 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.

## STEP-BY-STEP INSTRUCTIONS

1. String a cotton cord across the top of a blackboard to resemble a clothesline.
2. 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.

3. Share background material, and lead a discussion of the origins of fabrics. Ask students if they know the origins of the clothes they are wearing. Ask why we are more likely to wear wool when it is cold and cotton when it is hot (wool provides insulation and cotton releases body heat). Have them try to trace the clothing back from department store to manufacturer to producer.
4. Hand out student worksheets. Have students read the information printed on Student Worksheet A and find the definitions for vocabulary words on Student Worksheet B. Then have students look in the dictionary for words they were unable to identify.
5. Have students answer the questions on Student Worksheet C by using dictionaries, encyclopedias and Student Worksheet A.
6. Divide students into groups of four or five. Assign one article of clothing from the clothesline to each group. Have each group study the garment label and determine what is the origin of the material.
7. Have each group use encyclopedias, dictionaries and other library resources to gather information about the material from which the garment is made. Students should answer the following questions as they research the garment:
  - What raw materials were used to make the material?*
  - Is this a natural or synthetic material?*
  - Is the raw product of which the material is made produced in your state?*
  - If not, which states produce this material?*
8. Have each group prepare a report on the garment's origins to present to the class. As each group makes its report, one group member should hang the article of clothing back on the clothesline.

## **RELATED ACTIVITIES**

1. Have students look for the countries of origin on the labels of several articles of clothing and pinpoint the countries on a world map. Have students list the countries on the chalkboard and place a tally mark next to each one for every item of clothing that comes from there.
2. Enlist the help of your county Extension office in getting samples of cotton bolls and raw wool. Pull fibers from these raw materials and show students how they can be twisted into yarns.
3. Hang your clothesline, with garments, in the hallway along with information about each garment's origins.
4. If you have a sheep rancher in your area, invite him or her to your class to discuss the production of wool.

## **RESOURCES**

### *Student Books*

- Carrie, C. (1989). Quilts to Unusual Unicorns. Binney and Smith.
- Carrier, R. (1984). Hockey Sweater. Tundra.
- Hospkinson, D. (1993). Sweet Clara and the Freedom Quilt. Knopf.
- Miles, B. (1981). Secret Life of the Underwear Champ. Knopf.

### *Teacher Resources*

“The Story of Cotton,” National Cotton Council, PO Box 12285, Memphis, TN 38182 (20-page booklet for grades 4-6 tells the story of cotton in simple terms, including where and how cotton is grown, processed and woven into cloth, first 30 copies free, 25 cents for each additional copy).

***Related Internet Web Sites***

United States Department of Agriculture. Information on all commodities, and livestock produced by, exported to, or imported into the United States. <http://www.usda.gov>  
The National Agricultural Statistics Service. Production statistics for livestock and crops produced in the United States. <http://www.usda.gov/nass>

**EVALUATION**

A teacher answer page is provided for the student worksheet.

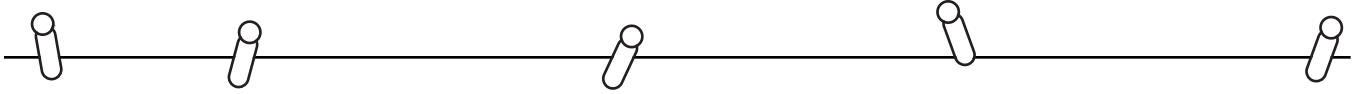
**ACKNOWLEDGMENT**

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# Clothesline Sleuth

A

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.



**Y**our 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 crop grown on farms in the southern states and some western states. 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. Wool is still a popular fiber for making clothes. Linen is also still in use but is very expensive because it is difficult to make.



Name \_\_\_\_\_

# Clothesline Sleuth

# B

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.
3. yarn      \_\_\_ A plant grown in warm climates for the fibers surrounding their seeds.
4. rayon      \_\_\_ A machine that separates the seeds, seed hulls and other small objects from the fibers of cotton.
5. natural fibers      \_\_\_ A woven fabric made from the inner bark of the flax plant.
6. cotton      \_\_\_ 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.
8. spinneret      \_\_\_ A synthetic fiber produced from wood pulp that has been chemically treated.
9. archaeologist      \_\_\_ The fine, soft, wavy, protective coat of domestic sheep and certain other animals.
10. wool      \_\_\_ 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.
15. cotton boll      \_\_\_ The rounded seed pod of the cotton plant.
16. flax      \_\_\_ Someone who looks for and studies material evidence from past human life and culture.



Name \_\_\_\_\_

# Clothesline Sleuth

# C

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? \_\_\_\_\_

How many years old do archaeologists think this material is? \_\_\_\_\_

4. Look up Mesopotamia in an encyclopedia. Name the country that is located where Mesopotamia once was located. \_\_\_\_\_

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

5. Scientists were trying to imitate what when they first began developing synthetic fibers? \_\_\_\_\_

6. 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.

What does the insect use it for? \_\_\_\_\_

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

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

Look on the map to find where each of these animals lives. \_\_\_\_\_



# Clothesline Sleuth (answers)

# C

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.**  
How many years old do archaeologists think this material is? **Archaeologist believe the linen fibers they found in Switzerland are 7,000 years old.**
4. 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.** 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.**
4. 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.**
5. 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.**  
What does the insect use it for? **Some insects secrete silky filaments with the spinneret.**  
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.**
6. 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 and sheep all have wool covering their bodies.**  
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.**

