Foxfire

Museum & Heritage Center

Fiber Microscopy for Kids

Activity Overview:

Back in the 1800s, long before stores like Old Navy or even Walmart were around, families had to make their own clothes. Clothes are made from woven fabric, which is made up of hundreds of individual threads. Each thread has thousands of tiny strands in it, called fibers. If you take a piece of yarn and pick it apart, you'll start to see the little fibers fraying at the end. These fibers come from both animals and plants. This activity will teach you about fibers and where they come from, how they are used, some of their different qualities, and how to identify them. We'll be using microscopic images to conduct our own fiber microscopy—or fiber identification at the microscopic level!

Let's learn about fibers:

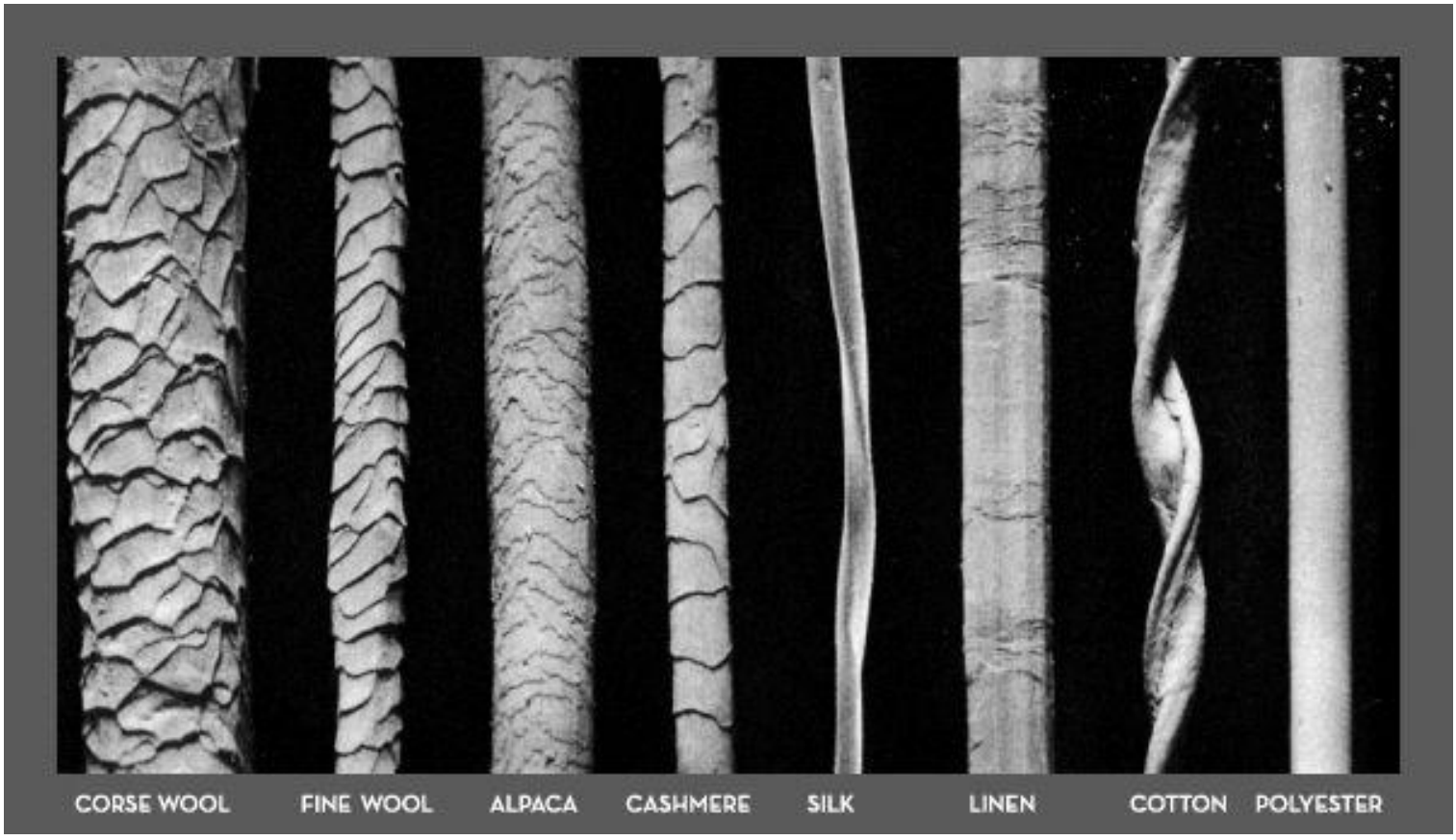
- **Cotton**: if you have on a t-shirt or jeans right now, chances are it's made from cotton. Cotton is now one of the most widely available fibers that still comes from natural materials. Cotton is plant that grows in warm areas—especially southern Georgia! It grows on a low bush and makes a white fluffy ball around a small, dark, hard seed. This fluffy ball is known as a "boll." If you have cotton balls in your house, unroll one and feel the fibers. Can you start to twist them together to make a string?
- **Wool**: Wool is the second most well-known natural fiber, but instead of a plant, it's grown on sheep! Every spring, sheep get haircuts so that they can stay cool in the summer. This hair is cleaned and combed before it is turned into wool fabric. Do you have a wool coat? Run your hand over it and feel the fabric. Wool is known for being warm and heavy—good for those cold months!
- **Flax**: Flax is another type of plant that makes a lightweight fabric like cotton. The fabric that comes from flax is called linen. Flax is a tall, thin, woody plant. The stems provide the fiber, but the seed is also used as a food source. Do you have any linen? It's often used for tablecloths and napkins. See if you can find a piece of fabric to feel!
- **Alpaca**: Alpacas are animals that look like llamas, and have been used to carry burdens up and down mountains. They have long, silky hair that is easy to spin. Like wool, it is soft and warm and often used for winter clothes.

How fibers become clothes:

Each fiber is treated a little differently in order to harvest it from the plant or animal. Once the fiber is harvested and prepared, though, all are spun using similar methods. The easiest way to spin fibers into yarn is by using a spinning wheel. Have you seen Sleeping Beauty? She pricks her finger on the shaft of a flax wheel, which has a pointy spindle to wrap the yarn on. Wheels for spinning animal fibers like wool typically do not have a sharp spindle. Once the yarn is spun, it is threaded onto a loom and woven into fabric. Once the fabric is finished, it can be sewn into clothes! Spun yarn can also be knitted into sweaters and socks. In Appalachia, wool and flax were most commonly used for clothing.

Looking Under the Microscope:

Let's take a closer look at these fibers. We know where they come from and how they are used, but what do they look like? Look at the picture below and refer back up to the descriptions of the fibers if needed.



Answer the following questions using the image above:

- Which fibers look most similar? Which are most different?

- What fibers come from animal hair? Do they have something in common?

- What fibers come from plants? Are they similar or different?

- Which fiber stands out as the most different from all the others?

- Where does polyester come from? Do some research if needed. How does it differ from the animal and plant fibers?

- Look at the pictures of wool. Do you think this fiber would be soft or scratchy?

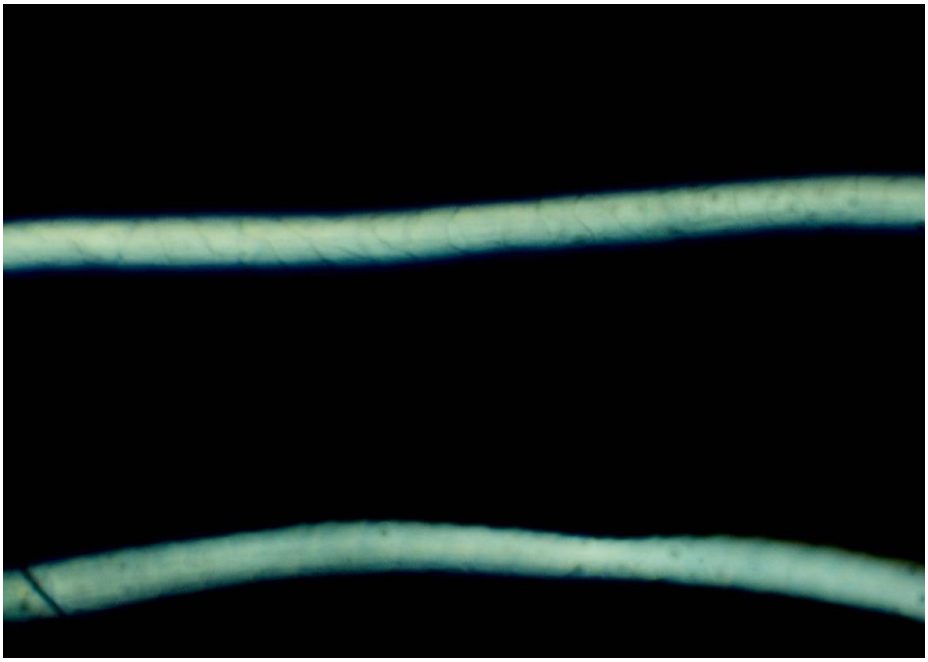
- What do you think is the softest fiber?

Time for Detective Work!

Using the information you learned above, try to figure out which fibers make up the artifacts donated to Foxfire. Read the descriptions, look at the images, and list which fiber you think best matches the evidence!

Case 1:

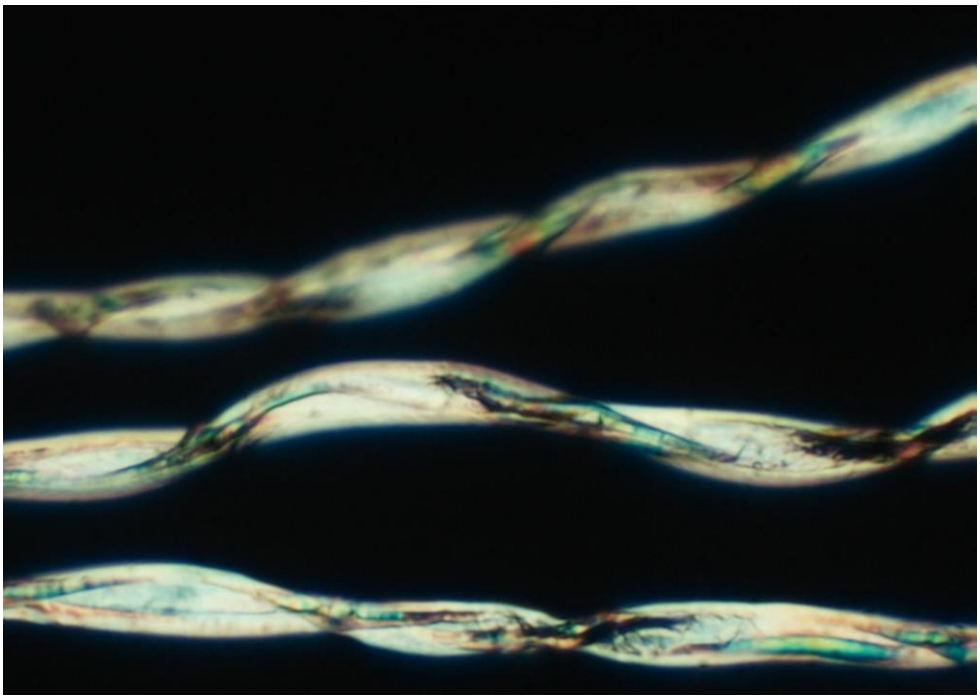
Foxfire recently received a coarse, knitted sweater from a family in the mountains. The family has raised animals for decades, and processed all of their fibers at home. Foxfire wants to figure out what type of fiber the family used for the sweater, so that they can take proper care of it. They took a fiber strand and put it on the microscope. This is what they saw:



What do you think the sweater is made out of? Explain why you picked this fiber.

Case 2:

Foxfire also received a quilt made up of lots of different patterned squares of the same fabric. The quilt came from south of Atlanta, Georgia from a farming family who raised mostly plants. The quilt is light and meant for sleeping under in the summer. Foxfire put a strand of this fiber under the microscope as well. Can you identify what they saw?



What do you think the quilt is made out of? Explain why you picked this fiber.

ANSWER SHEET

(Not for prying eyes!)

Sweater: wool

Quilt: cotton