



## Fur Real?

**Objective:** Students will use observational and critical thinking skills as they develop a procedure to identify hairs as either real or faux fur. Students will discuss potential areas of concern for consumers when items are not labeled or are labeled inappropriately.

**Grade Level:** 6-12

### **National Education Standards Addressed:**

#### Science

NS.5-8.1 and NS.9-12.1 Science as Inquiry  
NS.5-8.1 and NS.9-12.2 Physical Science

#### Language Arts

NL-ENG.K-12.5 Communication Strategies  
NL-ENG.K-12.7 Evaluating Data  
NL-ENG.K-12.12 Applying Language Skills

#### Common Core Standards

CCS. ELA.Science & Technical Subjects.6-8/9-10.3  
CCS. ELA.Writing.6-12. Text Type and Purpose. Item 1

**Character Connections:** Caring, Integrity, Citizenship

### **Materials Needed:**

- A variety of fashion magazines, one for each student (fall issues are most often full of both faux and real fur designs)
- Two faux and two real fur or fur-trimmed coats, sweaters, boots, etc., or other pieces of real and faux fur. These items will be cut into pieces and numbered. If possible, it would be beneficial to take a photo of the whole item, number it, and then number each piece with the corresponding number. (Note: It is best to obtain your real fur samples from a relative or friend who has old fur pieces they no longer want. We also have samples available; to have some sent to you, please email Stephanie Clark at [sclark@humanesociety.org](mailto:sclark@humanesociety.org) and provide your name, school and grade level, mailing address, and number of students or groups planned.)
- Three signs: one stating “faux,” one stating “fur,” one stating “unsure/not labeled”
- Three to six rolls of tape
- Permanent markers for each student
- [The HSUS Field Guide to Telling Animal Fur from Fake Fur](http://humanesociety.org/assets/pdfs/fur/field-guide-on-real-vs-fake-fur-final.pdf), available at [humanesociety.org/assets/pdfs/fur/field-guide-on-real-vs-fake-fur-final.pdf](http://humanesociety.org/assets/pdfs/fur/field-guide-on-real-vs-fake-fur-final.pdf)
- Lighters or Bunsen burners (not matches, as they have an odor and may mask the smell)
- Microscopes for each group (with micrometer if possible)
- Slides and cover slips for each group
- Magnifying glasses (optional)
- Rulers
- Tweezers
- Information Sheet, one for each student (see page 4)
- Fiber Reaction to Flame Chart, one for each student or group (see page 5)
- Worksheet #1, one copy per group (see page 6)
- Worksheet #2, one copy per group for each sample number and the control group (see page 7)



## **Procedure**

### **Preparation:**

1. Hang signs (faux, fur, and unsure/not labeled) in three separate areas of the classroom. Place tape rolls near each sign.
2. Number the pieces of fur or fur-trimmed items.

### **Opening:**

1. Provide students with a permanent marker and variety of magazines. Give them five minutes to rip out as many images of current fashion that show faux or real fur. Students are to label the image faux, real, or unsure as they work.
2. At the end of the five minutes ask the students to hang their labeled images under the appropriate sign.
3. Ask students to quantify, or calculate, the number of images listed under each label. Write the number on the sign above the images for later reference.

### **Lesson Body:**

1. Ask the class to look at the number of unsure/not labeled items and discuss in a [think-pair-share](#) with a neighbor or partner how the number of unlabeled items could impact a consumer. Allow two minutes for discussion.
2. Ask students to share their thoughts with the class. You may wish to list these items for future reference.
3. Advise students that today they will be learning how to recognize real fur from faux fur by doing experimentation on various samples.
4. Show a four-minute [video investigation](#) discussing how even a label may not guarantee if an item is real or faux. (The video is available at [humanesociety.org/issues/fur\\_fashion/](http://humanesociety.org/issues/fur_fashion/)).
5. Visually introduce the students to a variety of numbered coats or pieces of fur, letting them know that some are real fur and some are faux fur.
6. Ask students to initially classify each sample item as real or faux on Worksheet #1 in the column titled *Initial Hypothesis*. (They will skip item number one, the control group; this will be filled in later.) Once they have completed this task they should pick up a copy of the information sheet and return to their seats.
7. Ask students to read the Information Sheet. Answer any questions the student may have about the differences between real hairs and synthetic fibers.
8. Introduce students to the ways they can verify their hypothesis and tell if an item is real or faux fur. Provide students with a copy of [The HSUS Field Guide to Telling Animal Fur from Fake Fur](#). Ask them to read items 1-3.
9. Split the students into groups. Each group should obtain four samples of fur (one of each number), a microscope, slides, a magnifying glass, a Bunsen burner or other lighter, ruler, tweezers, and five copies of Worksheet #2.
10. Ask one person in each group to volunteer to provide sample #1, the "control group" on Worksheet #1 in their experiment. The volunteer will cut one small piece of hair or pull one strand out of his or her own head. Once each group has a "control" sample, ask each group to follow along as you begin the experiment.



11. Ask the students to fill in Sample #1 on Worksheet #1 with the name of the person to whom the hair belongs. Because this is the control group, and they saw the hair come from the group member, this is verified as a human hair.
12. Ask each group to use one copy of Worksheet #2 and begin by filling out a visual description of the control hair (Sample #1). Each group will then move onto the second item on Worksheet #2. Each group should measure their control sample.
13. Ask each group to prepare a sample slide for their hair and complete items three through seven on Worksheet #2. (Steps for preparing a slide can be found at [schools.utah.gov/curr/Science/sciber00/7th/cells/sciber/slidepre.htm](http://schools.utah.gov/curr/Science/sciber00/7th/cells/sciber/slidepre.htm).)
14. Ask the group to use Worksheet #2 and briefly sketch what they see in item number eight.
15. Introduce the burn test and pass out the Fiber Reaction to Flame Chart (page 6) to each student. (It is suggested that you model this for the group before allowing them to complete the task.) Hold the hair with tweezers and light one end. Extinguish the flame within a few seconds of lighting the hair and allow it to cool for 30 seconds. Establish the fact that animal/human hair will turn to ash and have an obvious odor. Ask a few students to smell your sample and describe it. Describe that faux hair will bead, as if the material is retreating or melting, not burning.
16. Allow students to complete item numbers nine and ten on the control sample, Worksheet #2.
17. Students should repeat lesson plan steps eleven through sixteen for each remaining sample, each time using a new Worksheet #2 and labeling the sample number.
18. Once all samples have been tested students should review Worksheet #1 and complete all final conclusions.

#### **Closure:**

1. Ask students to compare their first hypothesis sheet with their tested data sheet and see if any group got every item correct. Review with students the advantages and disadvantages of the burning test for identifying fibers.
2. Discuss as a class how each sample should be labeled and discuss any remaining questions about how difficult it can be to tell if garments are real or faux fur.
3. Introduce students to the [Truth in Fur Labeling Act](#). Discuss with students why the law exists, and ask whether, based on what they learned in this lesson, they think the law is important.
4. Ask students to choose an activity to follow up on the information they just learned:
  - A. Write a business letter to a fashion magazine or local retailer sharing their opinion about fur and how mislabeled items can impact a consumer and the importance of truth in labeling.
  - B. Ask students to write to one company thanking them for being fur-free. (You can find a list of companies who have fur-free policies in place at [humanesociety.org/issues/fur\\_fashion/tips/fur-free\\_shopping.html](http://humanesociety.org/issues/fur_fashion/tips/fur-free_shopping.html).)

In either option students should cite examples from their recent experiment as support for their opinion.

#### **Extension:**

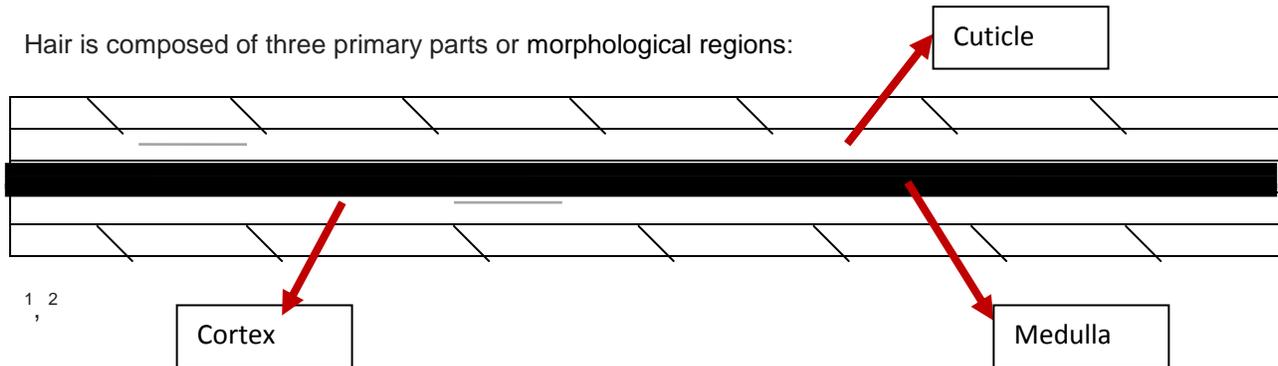
1. Students may wish to complete the [Mission: Humane Fight Fur project](#).
2. Students can write a persuasive paper about the issue of fur, fur farms, and trapping as well as the issue of truth in labeling of real and faux fur garments.



## Information Sheet

### The Physical Structure of Real Hair

Hair is composed of three primary parts or morphological regions:



**Cuticle** – outer coating composed of overlapping scales.

**Medulla** – central core, which may be absent.

**Cortex** – protein-rich composition surrounding the medulla; contains pigment.

Hairs are composed of the protein keratin can be of various shapes (round or oval) and textures (curly or straight).

The physical appearance of hair can be affected by nutritional situations found while the being was living and intentional alteration (heat curling, straightening, coloration, etc.) during the life or after the death.<sup>3</sup>

### The Physical Structure of Fiber

A fiber, the smallest component of a textile, is a material that may have a length many times greater than its diameter. A fiber can be spun with other fibers to form a yarn that can be woven or knitted to form a fabric. Over half of all fibers used in the production of textile materials are synthetic or manmade. Nylon, rayon, and polyester are all examples of synthetic fibers. Please refer to the *Fiber Reaction to Flame Chart* or [www.fabrics-manufacturers.com/fabric-identification-table.html](http://www.fabrics-manufacturers.com/fabric-identification-table.html) for examples.

<sup>1</sup>Using Hair for Identification. *Basic Hair Structure: Cross Section of Hair*.

[http://www.ecobyte.com.au/a\\_Basic\\_Hair\\_struct\\_Xsec.jpg](http://www.ecobyte.com.au/a_Basic_Hair_struct_Xsec.jpg). Accessed November 12, 2010.

<sup>2</sup>Chem 107. Hair Handout. [http://www.chem.sc.edu/analytical/chem107/lab4\\_032205.pdf](http://www.chem.sc.edu/analytical/chem107/lab4_032205.pdf). Accessed November 12, 2010.

<sup>3</sup>Sustaita, H. A Close Look at the Properties of Hair and Scalp. Houston Community College.

<http://www.texascollaborative.org/hildasustaita/module%20files/overview.htm>. Accessed November 12, 2010



### Fiber Reaction to Flame Chart

	<b>Melts Near Flame</b>	<b>Shrinks From Flame</b>	<b>Burns In Flame</b>	<b>Continues to Burn</b>	<b>Appearance of Ash</b>
<b><i>Natural Fibers</i></b>					
Silk	yes	yes	yes	slowly	soft black bead
Wool/Hair/Fur	yes	yes	yes	slowly	irregular/black
Cellulose (such as linen or flax)	no	no	yes	yes	light gray appearance
Asbestos	no	no	no	no	blackens
<b><i>Manmade Fibers</i></b>					
Acrylic Acetate Polyester (includes coal and petroleum- based products)	yes	yes	yes	yes	hard black bead (polyester bead is rounded in shape)
Nylon Polymide (made of petroleum)	yes	yes	yes	yes	hard gray bead
Olefin Vinal	yes	yes	yes	yes	hard tan bead
Modacrylic Saran	yes	yes	yes	no	hard black bead (bead is irregular in shape)
Metallic	yes	yes	no	no	beads
Glass	yes	slowly	no	no	clear bead
Rubber	yes	yes	yes	no	irregular accumulation
Spandex	yes	no	yes	yes	fluffy
Rayon (manufactured cellulose)	no	no	yes	yes	none



**Worksheet #1**

Name: \_\_\_\_\_ Date: \_\_\_\_\_

<b>Coat:</b>	<b>Initial Hypothesis of Each Item</b>	<b>Final Conclusion</b>
Sample #1 (Control Group)	No hypothesis. Hair is from _____.	Hair is human.
Sample #2		
Sample #3		
Sample #4		
Sample #5		
Sample #6		



## Worksheet #2

Name: \_\_\_\_\_ Date: \_\_\_\_\_

Sample #: \_\_\_\_\_

<b>Characteristics</b>	<b>Description</b>
1. Color	
2. Length (in millimeters)	
3. Condition of root (rounded, narrow, smooth, pointed, bits of skin attached, etc.)	
4. Condition of tip (frayed, smooth, bent, split, etc.)	
5. Width (if microscope is fitted with a micrometer)	
6. Cuticle (Are the scales flat and smooth, protruding, spiky, etc.?)	
7. Medulla (present/absent, broken/continuous, thick/thin)	
8. Sketch	
9. Burn test (ash/bead, smell-similar/different than control)	
10. Do you believe this hair to be real or faux?	