

Lesson 1

What Are Wood, Metal, Rubber, and Leather Like?

Objectives

Students will

- compare the properties of wood, metal, rubber, and leather objects
- classify and sequence objects based on various criteria
- observe how materials respond to being dropped

Vocabulary

gravity—a force that pulls things down to Earth

Structuring the Curriculum

Based on how students work together cooperatively decide whether to have them work alone, in pairs, or in groups of three. As group size increases, so does the level of cooperative skill required.

While giving students opportunities to handle materials and do their own investigations is preferable, much of this lesson could also be conducted as class demonstrations.

Preparation/Materials

Discussion: God Made Wood

- √ wooden object such as a wooden spoon
- √ tree cookie (thin cross-sectional slice of wood that includes bark)

Discussion: God Made Metal

- √ metal object such as a spoon

Discussion: God Made Rubber

- √ rubber object such as a rubber ball

Discussion: God Made Leather

- √ leather item such as a shoe that is natural in color

Activity: Observing Details and Activity: Classification

- √ magnifying glasses, one per student or group
- √ scissors, one per student or group
- √ Store the following sets of items in large sealable plastic bags, one per student or group:
 - small rubber ball
 - metal spoon
 - one-eighth rubber mousepad
 - wooden item (such as a block or a small piece of 2 x 4)
 - paper clip

- leather belt or a small piece of leather
- large-diameter pencil
- penny
- piece of aluminum foil,
- eraser
- rubber band

Activity: Identification

√ chart paper

Background

God supplies raw materials—such as the trees that are used for wooden objects and ore from which metals are purified—but people process these raw materials and make them into items such as those that students will observe in this lesson. Encourage appreciation for God’s provision of such a vast selection of raw materials to work with.

Metals are found in rock mixed with other elements in the form of ores. To obtain pure metals, ores are crushed, and the metal is extracted with the help of chemicals and heat. Natural rubber is made from the latex (sap) of a rubber tree. Most rubber comes from Malaysia and other countries of south-east Asia. Synthetic rubber is made from chemicals similar to those in rubber tree latex. Leather is the hide of a vertebrate (mammal, reptile, bird, or fish) which, through a process called tanning, has been made pliable and resistant to deterioration.

Discover

1. **Discussion: God Made Wood.** Gather students in a circle. Hold up a wooden item such as a wooden spoon. Discuss how wooden things come to be. Ask the following questions.
 - Did God make this item or did people make it? (People made it by working with wood.)
 - Where did the wood come from? (The wood came from a tree.) Show students the tree cookie, and discuss what it is, showing how wood comes from trees.
 - Who made trees? (God made trees.) Tell student that we depend on God in order to have wooden things.
2. Have students look around the room and identify other wooden things. Have students ask “I wonder” types of questions about wood.
3. Remind students how to make observations using their senses. (Also remind students that we don’t use our sense of taste while we are doing science unless the teacher says so.) Have students carefully observe the wooden item and describe it to you. If students struggle for descriptions, ask them about its color, size, shape, hardness, relative weight (light or heavy), texture, bendability, and so on.
4. **Discussion: God Made Metal.** Repeat steps 1–3 with a metal object such as a spoon. (Explain that metal comes from rocks called ore in the ground.)
5. **Discussion: God Made Rubber.** Repeat steps 1–3 with a rubber object such as a rubber ball. (Explain that rubber comes from the sap of rubber trees. Scientists also make artificial rubber from chemicals.)
6. **Discussion: God Made Leather.** Repeat steps 1–3 with a leather item such as a shoe that is natural in color. (Explain that leather is the hide of animals [such as cows] that is treated in a special way so that it stays flexible [bendable] and won’t rot.)

Develop

1. **Activity: Observing Details.** Distribute a magnifying glass and a plastic bag of wooden, metal, rubber, or leather items to each student or student group. Guide them in observing each item and describing what they see.

Remind students of any of the “I wonder” questions that they generated in earlier discussions, particularly if the questions led to investigations such as those that follow. Have students carry out some investigations, paying close attention so that they can make good observations. Ask the following questions about various items.

- Will it bend without breaking?
- What happens when you hold it up and let go of it? (Have students release the items one by one from shoulder height—perhaps on the count of three. Encourage students make observations not only with their eyes but also with their ears and their fingers. Have students notice what happens to each object. Did falling damage it? Did it bounce or respond

in some other notable way? Have students describe what kind of a sound the object made on impact. Once you ask the questions, allow students to drop the object again, paying close attention to note the answer to those questions.) After many objects have been dropped, note together that none of the objects floated or rose in the air—they all fell down. Introduce the term *gravity* as a force that pulls things down to Earth.

- What kind of sound does it make when you tap it with your fingernail?
- What happens when you try to cut the items with scissors? Discuss the relative hardness and softness of the items.
- How could you fasten two pieces of the same type of material together—for example, wood to wood or metal to metal? (Discuss whether glue, screws, welding material, or a needle and thread would be required.)

2. **Activity: Classification.** Have students consider ways to sort the objects. Have them play with different ways to group the objects. Options include classifying by

- shape (flat, not flat, round, square)
- transparency
- ability to bend
- ability to bounce
- sounds made when dropped
- how it falls to the ground (falls quickly or floats slightly)
- ability to be cut with a knife or scissors
- ability to stretch
- color
- texture (smooth, bumpy, scratchy)

Reinforce/Assess

1. Have students put the objects in sequential order by size and then by weight.
2. **Activity: Identification.** Have students look around the classroom and identify items that are made from wood, metal, rubber, or leather. List these on chart paper by drawing pictures and writing the names of the items.

Extend

- ▶ For show-and-tell over the course of the unit, have students show items made from the materials discussed in class.
- ▶ Set up a reading corner with books that show pictures of the various materials and how they are made.

- ▶ Provide props for the dress-up center that allow students to role-play professions in which people process the raw materials discussed in this lesson. Props might include clothing for lumberjacks, miners, smelters, carpenters, cowboys, and tanners.
- ▶ Have students use small pieces of wood, metal, rubber, and leather, to make a collage or a three-dimensional sculpture.