



Bouncing Sunlight Creating Moonlight

Young children love the moon! But, why does it light up our night time sky? Explore how the moon uses the sun's light to create the beautiful object we know and love.

Time

- 30 minutes

Grade

- K-3

Next Generation Science Standards

- 1-ESS1-1. Use observations of the sun, moon, and stars to describe patterns.
- 1-PS4-2. Make observations to construct an evidence-based account that objects in darkness can be seen only when illuminated.
- 1-PS4-3. Plan and conduct investigations to determine the effect of placing objects made with different materials in the path of a beam of light.

Utah Common Core Standards

- K.2.2 Observe and describe changes in day and night.
- 2.2.2 Observe and record recognizable objects and patterns in the night sky.
- 3.1.1b Explain that the sun is the source of light that lights the moon.

Materials

- An orange, or ball that size (per group)
- Piece of foil that is big enough to cover each orange
- Flashlight (per group)
- Science journals, or a pencil and paper (per student)
- Lab Sheet for older grades
- Materials to build a model Earth if you are doing the extension activity

Do Ahead

- This activity requires a dark room. Prepare your darkened classroom ahead of time

This lesson plan is adapted from **Bouncing Sunlight**

Jennifer Edwards, Utah Education Network- www.uen.org/lessonplan/view/2359

Background for Teachers

The moon is the only known natural body in space that travels along with Earth in its orbit around the sun. The moon is closer to Earth than any other known natural object in space. The light we see from the moon at night is light that the moon reflects from the sun. The closeness of the moon, and the amount of sunlight it reflects to Earth, makes the moon the largest and brightest object in the night sky. The moon is often bright enough to be visible through the day as well. It was only natural that early civilizations would be fascinated by the moon, and curious about its trip through the sky. Many thought the moon was a god, or the home of a god. The word "lunar" is derived from the name of the Roman moon-goddess- Luna.

Student Prior Knowledge

Students need to understand that the sun is a star that gives the earth sunlight and that the moon and Earth are spheres.

Directions

- Divide students into small groups (3-4 students). Have all materials ready
- Review with students the concept that the earth and the moon are spherical. Remind them that the light that warms the earth and gives us daylight comes from the sun.
- Discuss the importance of "models" and what they are. Tell students that today groups will be using the orange as a model of the moon to explain where the moon gets its light. The flashlight will be a model of the sun. Pose the question that the groups will be investigating and write it on the board: Where does the moon get its source of light?
- Pass out materials to each group. Have each group cover their orange or ball with foil. They can make it bumpy and with craters to look like the surface of the moon. Have them place it in the middle of a desk.
- Turn off lights. Have each group discuss any observations they make. Does the moon shine? Why or why not?
- Turn on lights and have students discuss their observations.
- Now turn the lights off once again, and have each group turn on their flashlight and shine it on the moon. Remind them the flashlight represents a model of the sun. Each group should discuss what they observe together. Does their moon look bright now? Does the sun light the moon? How does this take place?
- Turn the light back on and have students discuss or record observations. Based on their findings, what conclusions can they reach to answer the original question? Were their predictions correct?
- Discuss what occurs when the sunlight hits the surface of the moon. When students describe what they see, help them understand the when sunlight bounces off the surface of something, it is called a reflection.

Extension for older grades

Have your students experiment with creating the phases of the moon on their model. As a group have them engineer an Earth model. Give them parameters for their investigation- they can make a 2D or 3D model based upon your available supplies.

Have them investigate with the flashlight and moon model how to create a crescent and half moon. Describe this to students as an engineering challenge. They may need to change the size of the Earth model they make to succeed or change the distances between objects.

Discuss as a class what groups came up with for their Earth model and how they succeeded in creating shadows on their moon.