

# Bouncing Sunlight

## Summary

When seen at night, the moon seems to shine brightly in the sky. What we actually see is the reflection of the sun's light on the moon. The moon gets its light from the sun, just like we do on Earth.

## Time Frame

1 class periods of 30 minutes each

## Group Size

Small Groups

## Materials

For each group: (This could also be done individually)

- An orange, or ball that size
- Piece of foil that will cover the orange
- Flashlight
- Science journals, or pencil and paper

## 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. Even the word "lunar" comes from the Roman moon-goddess Luna, and is a word we use often to describe things about the moon. The spacecraft that landed people on the moon was called the lunar module.

## Student Prior Knowledge

This lesson follows lessons that the earth and the moon are spherical. Students also need to understand that the sun is a star that gives the earth sunlight.

## Intended Learning Outcomes

- Observe simple objects and report observations.
- Make simple predictions and inferences based upon observations.
- Demonstrate a sense of curiosity about nature.
- Report observations with models.

## Instructional Procedures

- Step 1. 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.
- Step 2. Pass out materials to each group. Discuss the importance of "models" and what they are. (A model helps us explain or show what happens with larger or smaller objects.) Tell them 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?

Have students write the question in their science journals. Accept all predictions from each group that might be an answer to this question. Write them under the question. Have students choose one they think might be the answer, or create one of their own and write it in their science journal.

Tell students that each step of the investigation will allow them to make observations to find answers. They will need to write their observations in their journals.

Step 3. Each group will 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.

Step 4. Turn off lights. (The room must be completely dark, without any reflected light.) Have each group discuss any observations they make. Does the moon shine? Why or why not? Where is the "moonlight" everyone talks about? Why does it stay dark?

Step 5. Turn on lights and have students record their observations. What are their conclusions so far? Can we state that the moon does not make its own light? Has our investigation answered our original question yet?

Step 6. 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 shining. 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?

Step 7. Turn the light back on and have students record observations. Based on their findings, what conclusions can they reach to answer the original question? Were their predictions correct?

Step 8. Discuss what occurs when the sunlight hits the surface of the moon. When students describe what they see, help them understand when sunlight bounces off the surface of something, it is called a reflection. Can they think of other times when light from something is reflected off a surface? (Headlight reflect streetsigns along a road, firelight from a campfire bouncing off someone sitting on the other side.)

Step 9. Have all students write a statement in their science journals that describes the sun as the source of light that lights the moon.

### Assessment Plan

Collect science journals. Look for recordings of observations and an explanation of how the sun is a source that lights the moon.

Create a Venn Diagram (intersecting circles graphic organizer) that shows how the moon and the Earth are alike, and how they are different. (Suggestions follow:)

#### Alike:

spherical  
made from rock  
orbit  
have gravity  
reflect sun

#### Differences:

Size  
Earth has water; moon does not  
Temperature

Display Venn Diagrams after checking for accuracy.

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