

Modeling the Phases of the Moon

Name: _____ **Date:** _____

LEARNING OBJECTIVE

Students will use a physical model to explain why the Moon appears to change shape throughout its orbit around Earth.

MATERIALS NEEDED

- small foam or styrofoam ball (or an orange/tennis ball)
- pencil or skewer (to hold the ball)
- a lamp or flashlight (representing the Sun)
- dark room
- notebook paper
- pencil

HANDS-ON ACTIVITY

1. Insert a pencil or skewer into your ball to create a handle, representing the Moon. Set up a lamp or flashlight in a darkened room to represent the Sun, with you standing in as Earth.
2. Hold the 'Moon' at arm's length and slowly rotate your body in a full circle, keeping the ball between you and the light at the start (new moon position).
3. Stop at 8 positions around your circle (every 45 degrees) and, at each stop, observe and sketch the shape of the lit portion of the ball as seen from your eye -- this is the moon phase at that position.
4. Label each of your 8 sketches with the correct phase name: new moon, waxing crescent, first quarter, waxing gibbous, full moon, waning gibbous, last quarter, waning crescent.
5. Write a 3-4 sentence explanation of why the Moon does not produce its own light but instead reflects sunlight, based on what you observed.

QUESTIONS

1. **Why did the ball appear completely dark when it was directly between you and the light source?**

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2. **Why did the ball appear fully lit when it was on the opposite side of you from the light source?**
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3. Does the Moon actually change shape during the month? Explain what is really happening.

4. About how many days does it take the Moon to go through a full cycle of phases, and what is this cycle called?
