
The Moon Phase Trek

An Educator's Reference Desk Lesson Plan

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Grade Level(s): 6

Subject(s):

- Science/Space Sciences

Duration: one 50-minute session

Description:

Students will use drawing paper, softballs, and flashlights to simulate the phases of the moon.

Goals:

Students will demonstrate an understanding of:

1. The positions of the sun, the moon, and Earth affect the phases of the moon.
2. Light from the sun reflects off the moon.

NSES: Science as Inquiry; Earth and Space Science: Most objects in the solar system are in regular and predictable motion. These motions explain the phases of the moon, p. 160.

Previous Knowledge Needed: Students need to know that objects in the solar system, such as the sun, Earth, and the moon are in regular and predictable motion.

Objectives:

Students will:

1. recognize that the positions of the sun, the moon, and earth affect the phases of the moon.
2. observe and draw the phases of the moon on a moon chart.
3. predict what phase the moon will be in the following week.

Materials:

- Drawing paper
- softballs (1 per group of 4 students)
- flashlights (1 per group of 4 students)
- moon phases transparency
- moon phases activity worksheet (moon chart)

Procedure:

Scientific Explanation:

How do the positions of the sun, the moon, and Earth affect the phases of the moon? The moon phase we see on any given night depends on the positions of the moon, the sun, and Earth in space. The moon receives light from the sun, just

as Earth does. Just as half of Earth experiences day while the other half experiences night, one half of the moon is lit by the sun while the other half is dark. As the moon revolves around Earth, we see different parts of the side of the moon that is facing the sun. This makes the moon appear to change shape. Waxing refers to the moon growing larger night by night. The moon is said to be waning when it seems to be getting smaller night by night. It takes the moon about one month to go through its entire set of phases.

Focus Phase:

How many different moon shapes have you seen? Round shapes? Half-circle shapes? Crescent shapes? Why do you think this happens? What affects how much of the moon we see? Think-Pair-Share to facilitate student discussion and then develop class list of “our best thinking so far.”

Challenge Phase:

How do the positions of the sun, the moon, and Earth affect the phases of the moon? How many phases of the moon are there? Draw each prediction of the moon phases on your paper. Demonstrate moon phase exploration activity to class. Move desks to create space and divide into groups. Give each group of four students a flashlight, softball, and moon charts.

1) Turn on the flashlight and darken other lights in the room. Select a member of your group to hold the flashlight; this person will be the “sun.” Select another member of your group to hold up the softball so that the light shines directly on the ball; this person will be the “moon” in your experiment. The remaining member(s) in your group will be the Earth and should sit between the sun and the moon.

2) Observe how light shines on the moon. The student who is holding the “moon” should begin to walk in a slow circle around the Earth, stopping at least seven times at different spots (as indicated on moon chart worksheet). Each time the “moon” stops, observe the moon and shade in the corresponding dark portion. The person with the flashlight (the sun) and the Earth must remain stationary while the moon is rotating around the Earth.

Concept Introduction:

Ask students to share results from the investigative phase. Update “Our best thinking so far” by writing and drawing results. Ask: What are the different phases of the moon? How did the shape of the moon change as you circled around the flashlight (sun)? How were these shapes formed? Compare and contrast your drawings with those of other groups. Discuss similarities and differences in the drawings. In your own words, explain how the positions of the sun, the moon, and Earth affect the phase of the Moon we see on Earth. Emphasize that it is not a shadow that causes moon phases. Introduce the scientific concepts/vocabulary of new moon, first quarter moon, full moon, last quarter moon, and a “waxing” and “waning” moon. Compare your drawings with the moon phases shown on the transparency. Which phase is the moon in for each group’s drawing. Label each drawing with the correct moon phase. Read descriptions of each phase to the class from *The Moon Book* and show corresponding illustrations.

Concept Application:

What phase is the moon in this week? (Hint – last week the moon was in the “last quarter”.) Based on what we have just learned about moon phases, predict which phase the moon will be in next week? Provide rationale for your choice. Have students monitor the moon nightly for the next few weeks and record their observations in a science journal.

Assessment:

Students will demonstrate science understandings by:

- 1) Explaining that the positions of the sun, the moon, and Earth affect the phases of the moon;
- 2) Explaining that light from the sun reflects off the moon (the moon does not shine);
- 3) Correctly predicting what phase the moon will be in the next week.

Other References:

Lesson adapted from: Blaustein, et al. (1999). *Glencoe science: An introduction to the life, earth, and physical sciences*. New York: Glencoe McGraw-Hill.

Gibbons, G. (1997). *The moon book*. New York: Holiday House.