

Eclipses

Companion Text: If You See the Moon, by Zia Wells

Subject Area & Grade Level: Science, 4th Grade

Materials: Flashlight, Styrofoam balls on a stick or pencil—1 large, 1 small

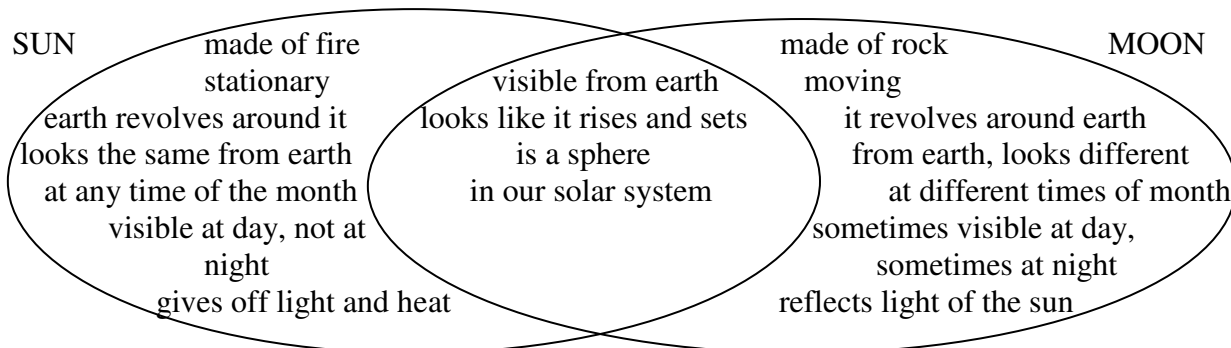
Objectives

After this lesson, students will be able to:

- Compare and contrast the sun and the moon
- Describe the motion of the moon in the sky
- Explain why there are solar and lunar eclipses

Staging Activity

Read the story once through without stopping. Then ask the students what they know about how the moon moves through the night sky. Do they notice that it rises and sets like the sun? Do they notice that it is not always the same shape? Do they notice that it is visible at different times of the day? Create a Venn diagram with students on the board comparing and contrasting the sun and the moon. Include the following similarities and differences:



Core Activity

Explain that the moon revolves around the earth every 29 ½ days in a slightly different plane (5 degrees off) of the plane in which the earth is revolving around the sun. The moon looks different and is visible at different times of the day because the amount of sun it reflects changes as it's at different points on its revolution. Using a large Styrofoam ball as the earth and a small one as the moon, tell students to pretend that a whole wall of the classroom is the sun, shining on the earth and moon. Ask them to describe which direction the shadows of the moon and the earth would go (away from the sun). Move the moon around the earth, emphasizing (even slightly exaggerating to make the point) the fact that it is revolving in a different plane.

Talk students through where the shadow of the moon would be at each point on its revolution. Try to lead them into understanding that when the moon is in the “new moon” position (between the earth and the sun), that we are not able to see it from earth because the shadow side is facing us. Show that similarly, in the “full moon” position, we see the lit side of the moon. Model this



with a student holding a large flashlight acting as the sun, but be sure students understand that the relative size of the sun to the moon and earth is much, much greater than the model shows.

Extension

Point out that usually, the shadows of the moon and earth do not fall on each other, because of the moon revolving in a different plane. However, occasionally, the sun, moon and earth will line up such that the moon will pass through the shadow of the earth (a lunar eclipse) or part of the earth will be in the shadow of the moon as it revolves (a solar eclipse). Define these eclipses for students. Ask students to work with a partner to try to draw each type of eclipse. Diagrams should include the relative positions of the sun, moon, and earth, and their shadows. Ask for volunteers to share their pictures on the board, and offer the following diagrams for them to check their work:

