

Solar System Activity Bag

Eclipses: Student Activity Guide

During the *Phases of the Moon* activity, we saw that the dark part of the moon is in shadow. However, both the Earth and the moon also cast shadows on each other. These shadows cause eclipses. Eclipses happen when the Earth or the moon casts a shadow on the other. In this activity, we will simulate eclipses.

These directions will get you started. Your teacher will be in contact to guide you and provide information.

Materials From The Bag

- 1 Foam Ball, 3”

You Will Supply These Materials

- Pencil
- A darkened room with a lamp with the shade removed.

Part 1: Lunar Eclipse - Exploration

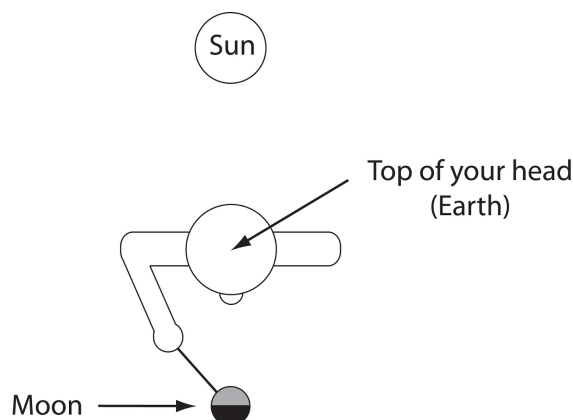
This part of the activity helps to understand a lunar eclipse. It uses a lamp as the sun, your head as the Earth, and a foam ball as the moon.

1. Take the foam ball from the bag and get a sharpened pencil.
2. Hold the ball on a table and press the pencil point into it. The ball should be firmly on the end of the pencil. From now on, that ball is your moon.
3. Check with an adult to find a table lamp or floor lamp with a removable shade. Remove the shade so that the light bulb is bare.
4. Turn on the lamp and put it in the center of a room and darken the room. If it's a floor lamp about as tall as you, that's fine. If it's a table lamp, be sure it's up on a table. The light should be about the same height as your eyes. If you do this during the day, block light coming in the windows. If it's night, turn out all lights except the bare bulb. That bulb is your sun.
5. Your head is the earth.
6. Your challenge is to have your head (Earth) cast a shadow onto the foam ball (moon). Work with the materials until you complete your challenge.
7. After you complete the challenge, draw where the light bulb (sun), your head (Earth), and the foam ball (moon) were in relation to each other.

You just modeled a lunar eclipse. A **lunar eclipse** occurs when the Earth casts its shadow on the moon.

Part 2: Lunar Eclipse - Simulation

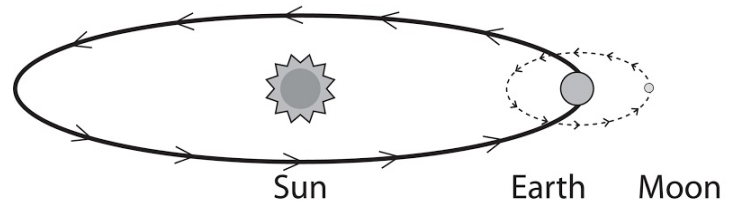
1. Stand about 10 feet away from the bulb (sun) and turn your back to it. Place the foam ball (moon) in front of you so that the foam ball (moon) is in line with the bulb (sun) and your head (Earth). What do you notice?



What's happening...

Look at the diagram to the right. The Earth orbits the sun (solid line) and the moon orbits the Earth (dotted line). Sometimes the Earth is in between the sun and the moon and the Earth's shadow covers the moon.

This is a lunar eclipse.



Part 3: Solar Eclipse - Exploration

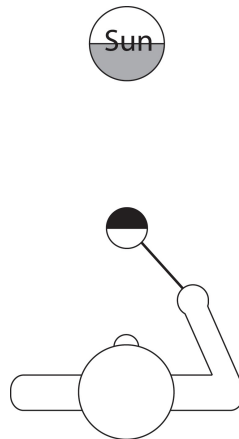
This part of the activity helps to understand a solar eclipse. It uses a lamp as the sun, your head as the Earth, and a foam ball as the moon.

1. Your challenge is to have the foam ball (moon) cast a shadow onto your head (the Earth.), blocking out the light bulb (the sun). Work with the materials until you complete your challenge.
2. After you complete the challenge, draw where the light bulb (sun), your head (Earth), and the foam ball (moon) were in relation to each other.

You just modeled a solar eclipse. A **solar eclipse** occurs when the moon casts its shadow on the Earth.

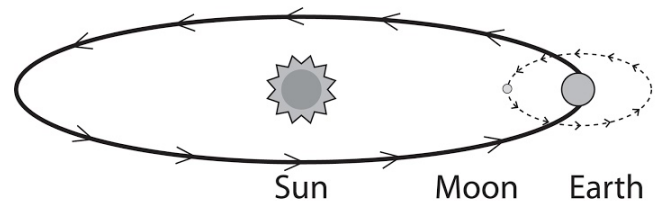
Part 4: Solar Eclipse - Simulation

1. Stand about 10 feet away from the bulb (sun) and hold the foam ball (moon) toward the sun. Place the foam ball (moon) in front of you so that it is in line with the bulb (Sun) and your head (Earth). What do you notice?



What's happening...

Look at the diagram to the right. Sometimes the moon is in between the sun and the Earth and the moon's shadow covers the Earth. This is a solar eclipse.



Part 5: Claims and Evidence

Using your materials, explore the statements below and decide if you agree or disagree. Use evidence from this activity to support your claim.

1. You hear one of your friends say, "Lunar eclipses can occur during all phases of the moon: new, full, first quarter, and third quarter."
2. You hear one of your friends say, "It is impossible to have a solar eclipse with a full moon."