



Lesson Plan Information

Name: Solar Eclipse

Grade: K-8

Topic: Students will learn about the sun, moon, and earth, and their relationships to one another. Students will also learn about the different types of solar eclipses and use materials to model the basics of a partial, annular, and total solar eclipse.

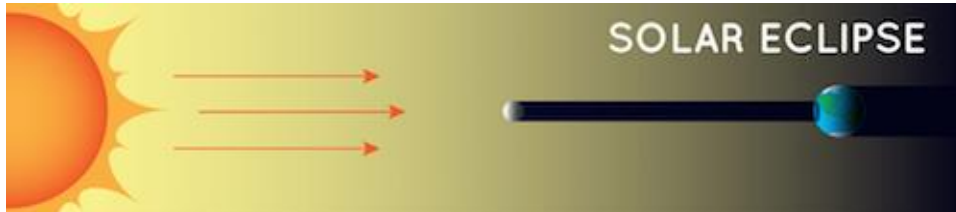
Time: 30-45 mins.

Introduction:

On Monday, April 8, 2024, a total solar eclipse will cross North America, passing over parts of Mexico, the United States, and Canada. In fact, parts of Texas, including Dallas, lie right in the path of the total eclipse. That is exciting!



What exactly is a solar eclipse? A solar eclipse happens when the moon's orbit matches that of the Earth and the sun. The moon moves in between them and blocks out some or all the sun's light. The moon's shadow creates varying degrees of darkness depending on the type of eclipse. There are three distinct types of solar eclipses: partial, annular, and total.



A partial solar eclipse occurs when the earth, moon, and the sun aren't exactly lined up. The sun will appear to have a dark shadow on only part of its surface. In a partial eclipse, the sky will go dark but not become pitch black.



1 Partial Solar Eclipse

An annular solar eclipse happens when the moon is the farthest distance from the Earth and doesn't block out the entire sun. The moon appears to be smaller, looking like a dark disk on top of the sun's larger disk. An annular solar eclipse makes it look like the moon has a ring of fire around it. The amount of light in the sky is like a sunrise or sunset.



2 Annular Solar Eclipse

A total solar eclipse happens when the moon lies exactly in a direct line between the sun and the Earth, completely blocking out the sun's light. During a total eclipse, it can get as dark as night. To see all the stages of a total solar eclipse, you must view it from the path of totality. The path of totality is the location on earth where the moon's shadow completely covers the sun. Observers viewing the eclipse from outside the path of totality may observe a partial eclipse.



3 Total Solar Eclipse

Solar eclipses happen about every 18 months and only last for a few minutes. Getting a chance to see a total solar eclipse is rare. The moon's shadow on Earth isn't very big, so only a small portion of places on Earth will see it. You must be on the sunny side of the planet when it happens. You also must be in the path of the moon's shadow.

SAFETY!

While we can't see the full light of the sun, the damaging solar radiation is still getting through. Looking directly at a solar eclipse could severely damage your eyes. That is why it is important to wear ISO certified eclipse safety glasses when viewing an eclipse.



Key Terms:

Annular Solar Eclipse: Occurs when the moon is the farthest distance from the Earth and appears as a dark disk on top of the sun's larger disk. An annular solar eclipse makes it look like the moon has a ring of light around it.

Orbit: A regular, repeating path that one object in space takes around another one.

Partial Solar Eclipse: Occurs when the Earth, moon, and the sun aren't exactly lined up. The sun will appear to have a dark shadow on only part of its surface.

Path of Totality: The locations on earth from which the moon's shadow completely covers the sun.

Solar Eclipse: Occurs when the moon's orbit matches that of the Earth and the sun. The moon moves in between them and blocks out some or all the sun's light.

Solar Radiation: Sunlight and energy that comes from the sun and travels to Earth in the form of light waves.

Total Solar Eclipse: Occurs when the moon lies exactly in a direct line between the sun and the Earth, completely blocking out the sun's light.

Materials:

Kit will include:

- Paper lantern
- Modeling clay
- Popsicle sticks
- Eclipse glasses
- LED Light bulb to hang inside lantern



*Videos and additional information
can be found on the DFW Earth
Day website*

Procedure:

1. Ask students for their prior knowledge about the Moon and eclipses.
2. Ask students if they've ever used their hand to block sunlight. Have students demonstrate how they do this, inside the classroom, pretending the lights are the sun.



3. Ask students if they've ever used anything else to block sunlight. Depending on their answers, ask if they've ever used a visor or ducked behind a tree or building to find shade.
4. Show students the yellow paper lantern and explain that we are going to pretend this is the sun.



5. Have students pretend they are using their hands to block the sun's rays.



6. Ask students what objects they have seen in the sky during the day or at night. Ask students if any of those objects would be able to block the Sun. If available, hold up toy examples of objects that they've named, such as an airplane or bird. If they haven't already mentioned the moon, ask if the moon might be able to block the sun.
7. Distribute the modeling clay and popsicle sticks. Instruct the students to create a ball with the modeling. Have them insert their popsicle stick into their clay ball and explain that the clay ball represents the moon.
8. Ask students to hold up their moon to try to block the yellow circle or ball representing the sun. Does the moon block the sun entirely? If not, what do they need to do to fully block the sun?
9. Have students stand up and form a circle or semicircle around the sun. Have them move closer to or farther from the sun and change the distance between the moon and their head as needed so that the moon will block the sun.
10. Discuss with students what happens when the moon partially and fully blocks the sun. What do we see from Earth? Explain that we call it a solar eclipse when the moon blocks either all or part of the sun.
11. Explain to students that their head represents Earth in this model. Show students how the moon orbits Earth and have them practice orbiting. Note: the moon orbits Earth in a clockwise direction as viewed from above the north pole.

12. Have students continue to model the moon's motion until they return their moon to the position where it totally blocks the sun. Explain that this is what happens during a total solar eclipse.



13. Have the students model a partial solar eclipse by positioning their moon so that only part of the sun is blocked.



14. Explain that everything must be lined up just right for a solar eclipse to occur. Explain that sometimes the moon's orbit takes it slightly higher or lower than where the sun appears in the sky. Have the student's model this. If the moon is higher or lower, does it block the sun?



15. Have the students walk toward the sun. Does the moon still fully block the sun? Have them walk forward until the sun leaves a thin ring around their moon. Explain that what they are seeing is known as an annular eclipse and can occur when everything lines up just right, but the distances are not far enough for the moon to totally block the sun.



16. Discuss the total solar eclipse that will be happening on April 8, 2024. Distribute the glasses to the students and explain the importance of wearing ISO certified eclipse safety glasses when viewing the eclipse. Explain the path of totality to the students. Ask them what type of eclipse they expect to see from where they live.

Key Take Aways:

After completing this activity students will:

- Know what a solar eclipse is.
- Be able to identify the different types of eclipses.
- Improved observation skills.

Links/Videos on Solar Eclipses:

Lesson plan was adapted from the NASA “Model of a Solar System” Classroom Activity:

[Educator Guide: Model a Solar Eclipse | NASA/JPL Edu](#)

[7 Amazing Facts: Does It Get Dark During a Solar Eclipse? 2024 \(astrolover.com\)](#)

[2024 Total Eclipse: Where & When - NASA Science](#)