LIMITLESS SPACE INSTITUTE

Solar Eclipse Cups

Subject: Space Science

Grade: Kindergarten through 8th Grade

Time: 20 – 30 minutes

Learning Objectives:

- Identify key solar system components: Sun, Earth, and Moon.
- Develop fine motor skills through the hands-on creation of a 3D model representing a solar eclipse.
- Gain spatial understanding, exploring shadows and observing model changes during different eclipse stages.
- Foster interdisciplinary connections by encouraging creative expression.
- Spark curiosity and wonder, nurturing a lasting interest in astronomy among students.

Standards and Competencies:

NGSS Middle School (6-8)

- MS-ESS1-1 - Earth's Place in the Universe: Develop and use a model of the Earth-sun-moon system to describe the cyclic patterns of lunar phases, eclipses of the sun and moon, and seasons.

Background Knowledge:

Solar eclipses occur when the Sun, the Moon, and Earth line up, either fully or partially. Depending on how they align, eclipses provide a unique, exciting view of either the Sun or the Moon.

A solar eclipse happens when the Moon passes between the Sun and the Earth, casting a shadow on Earth that either fully or partially blocks the Sun's light in some areas. This only happens occasionally, because the Moon doesn't orbit in the exact same plane as the Sun and Earth do. The time when they are aligned is known as eclipse season, which happens twice a year. https://science.nasa.gov/eclipses/types/

Materials:

- Small LED Flashlight
- Two Dixie cups
- Black, blue, green/brown markers

Procedure:

- Start the lesson by discussing what a solar eclipse is and its significance.
    - Explain that it occurs when the moon passes between the Earth and the Sun, casting a shadow on Earth.
- Students need to draw a small black dot on the side of one Dixie cup to represent the new moon.
- On the second Dixie cup, have the students draw a simple Earth with continents (green marker) and oceans (blue marker).
- Have the students place the flashlight (SUN) in the cup that has the “new moon” on it.
- Place the “Earth” cup on top of the “New Moon” cup so that the images align.
- Students can rotate the “Earth” cup to show how the shadow of the moon goes over the “Earth”.
- Link to video instructions

Assessment:

- Assess the accuracy and completeness of each student's solar eclipse model, focusing on the correct positioning of the Earth, Moon, and Sun.
- Encourage students to verbally explain their models to the class, assessing their communication skills and conceptual understanding.

Additional Resources:

- 2024 Total Eclipse: When and Where
- Eclipses: Crash Course Astronomy #5

**Note: The duration and complexity of the design challenge can be adjusted based on the students’ age, skill level, available materials, and time constraints.