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| Name: | **[insert name]** | Period: | **[insert Period]** | Date: | **[insert date]** |

Introduction to Solar Eclipses

# Background

Twice a year, parts of the Earth can experience an interesting phenomena called a solar eclipse. In these events, the sun is blocked, creating darkness for a few minutes. There are two main types of eclipses: total and partial. In a total eclipse, a location on Earth will see the sun completely covered causing it to become as dark as night. In a partial eclipse, a location on Earth will see a portion of the sun covered, but will still have mostly normal sunlight.

In this activity, we will explore how these eclipses occur!

## Making a Hypothesis

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| **Question/ Prompt** | **Your Response** |
| Make a hypothesis about what causes solar eclipses. Be sure to use an “If...then…” statement. |  |

# Using a Model

## Materials

* A light source (lamp, flashlight)
* Dark room
* Styrofoam ball, orange, or other soft circular object
* Sharpened pencil or wooden skewer

## Set Up

1. Place the light source in the dark room.
2. Carefully push the pencil/ skewer through the center of your circular object. You want to make sure to push deep enough so that the round object is stable if you only hold the skewer.
3. Turn on the lamp and darken the room. Be careful not to look directly at the lit bulb as this can hurt your eyes.
4. Use the next few pages, to help guide you through the model.

## Model Instructions

Please follow the directions below and answer the questions in the table below.

Looking for help [setting up the model](https://vimeo.com/502766104)? [Using the model](https://vimeo.com/502766104#t=366s)?

1. Stand three to four feet away from your light source. Face the light source directly (toes pointing toward the light source).
   1. The light source is going to model our sun, your head is going to model the moon, and the skewered ball is going to model the Earth’s moon.
2. Hold the moon in position for you to see the “New Moon” phase. The sun should be directly in front of you, your moon should be outstretched in front of you, placing it between the sun and the Earth.
   1. The moon should completely block the light source and might even create a halo effect around the moon that we see in some eclipses.
3. Move the moon down slightly so only part of the sun is covered and you can now see what a partial eclipse looks like.

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| **Question/ Prompt** | **Your Response** |
| What is the object that blocks the sun in a solar eclipse? |  |
| Is it possible to see a solar eclipse when the moon is not in its new moon phase? Explain. |  |

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# Gathering Information

Watch [NASA Space Place’s “What is a Solar Eclipse?”](https://www.youtube.com/watch?v=nBN3jheTBG0) and answer the questions below.

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| **Question/ Prompt** | **Your Response** |
| What is the path of totality? |  |
| What part of the sun can we see during a total solar eclipse? |  |

Read Universe Today’s article [“Earth, Sun, and Moon”.](https://www.universetoday.com/26987/earth-sun-and-moon/#:~:text=The%20average%20distance%20from%20the,km)%2C%20you%20get%20403.)

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| **Question/ Prompt** | **Your Response** |
| How many times bigger is the diameter of the sun than the Moon? |  |
| How many times farther away is the sun from earth than the moon? |  |
| Why can total solar eclipses occur when the moon is drastically smaller than the sun? |  |

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