

# Solar and Lunar Eclipses

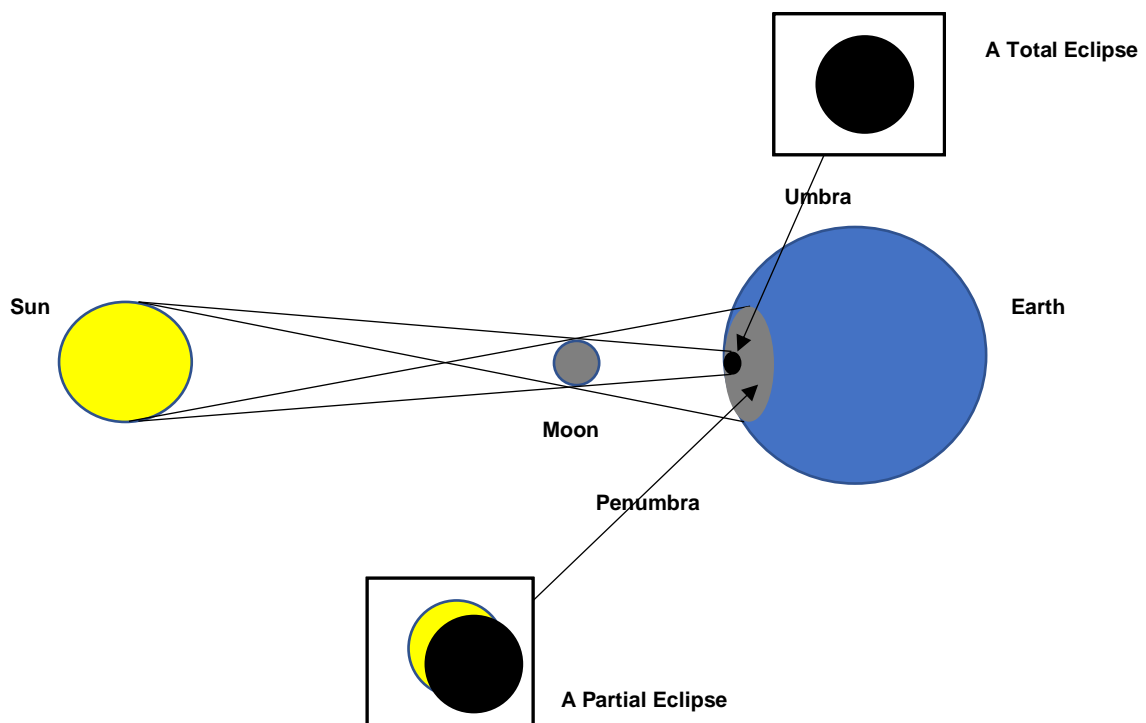
An eclipse occurs when light from one object is blocked by another object. When the Moon is between the Earth and the Sun, the light from the Sun is blocked. That is a **solar eclipse**. When the Earth is between the Sun and the Moon, then the Sun's light on the Moon is blocked. That is a **lunar eclipse**.

Solar and lunar eclipses always occur within two weeks of each other.

## Solar Eclipse:

There are three main types of solar eclipses: **total**, **partial** and **annular**.

The **umbra** is the Moon's shadow on the Earth. It is the area that is fully shaded by the Moon eclipsing the Sun. If you are standing in it, you see a **total eclipse**.

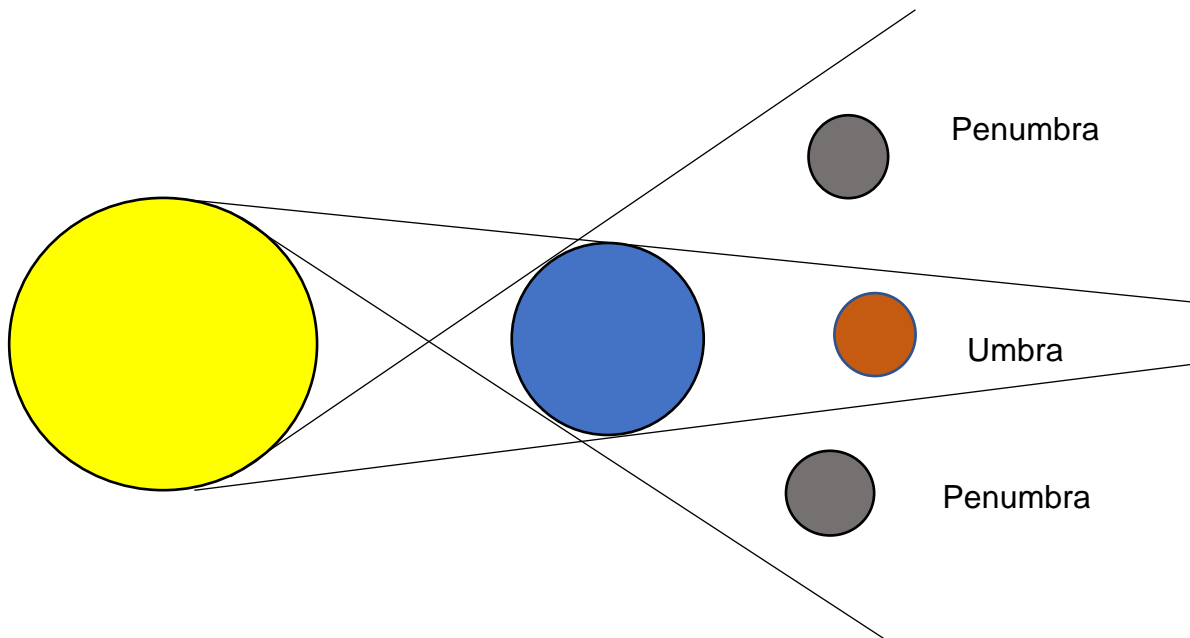


The **penumbra** is the partially shade area of the Moon's shadow on the Earth. If you are standing in it, you see only a **partial eclipse**.

**Annular eclipses** of the Sun occur when the Moon is farthest away from the Earth – when it is at **apogee**. Being farther away then, it appears smaller and therefore cannot completely cover the Sun. Thus, the outer edge of the Sun appears as a bright ring around the silhouette of the Moon:



## Lunar Eclipse:



During a **lunar eclipse**, when the Moon passes completely into the **umbra**, the Earth's shadow completely covers the Moon and it appears a red/orange color.

The Moon appears red/orange during a lunar eclipse because red/orange light coming from the Sun gets bent around – refracted – by the Earth's atmosphere, then hits the Moon and bounces back to Earth.

The blue light from the Sun gets scattered in the Earth's atmosphere. (That is why our sky appears blue.)

