Sun, Earth, and Moon Unit
Parent Background Information

The Sun and Earth's Climate

The word "climate" comes from the Greek word "klima", meaning inclination. While weather describes the day-to-day changes in rainfall, temperature, etc., climate refers to the long-term conditions of weather in a region. A number of factors influence a region's climate: latitude, altitude, topography, proximity to large bodies of water, and global wind patterns. In this unit, we are focused primarily on the effect of latitude and the distribution of sunlight on climate. Closer to the equator, the Earth receives more direct light, meaning it is concentrated in a smaller area, thus raising temperatures. At higher latitudes, that same amount of light energy has to spread out over more area due to Earth's spherical shape (over Earth's curve), so the resulting temperatures are cooler.

Phases of the Moon

From any location on the Earth, the Moon appears to be a circular disk that, at any specific time, is illuminated to some degree by direct sunlight. Like the Earth, the Moon is a sphere which is always half-illuminated by the Sun, but as the Moon orbits the Earth we get to see more or less of the illuminated half. During each lunar orbit (a lunar month), we see the Moon's appearance change from not visibly illuminated, through partially illuminated, to fully illuminated, then back through partially illuminated to not illuminated again. Although this cycle is a continuous process, there are eight distinct, traditionally recognized stages, called *phases*. The phases designate both the degree to which the Moon is illuminated and the geometric appearance of the illuminated part.

Eclipses

When a planet passes between the Sun and another planet or a moon, it casts a shadow called an *eclipse*.

- When the Moon moves into the Earth's shadow, a *lunar eclipse* occurs. This is the most common and observable type of eclipse. In a lunar eclipse, all or part of the Moon is dark.
- When the Moon passes between the Sun and the Earth, a solar eclipse occurs. The Moon's shadow falls on the Earth, which causes a portion of the Earth to become dark. Solar Eclipses last for only around eight minutes, but are much more dramatic than lunar eclipses. Darkness falls in the middle of the day, but the day-time sounds of nature become unnaturally quiet as they would be at night. Because the Moon is much smaller than the Earth, the shadow of the Moon does not completely cover the surface of the Earth during a solar eclipse.

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