

# The Sun

## Overview

The rise of the sun and moon appear to be a simple occurrence every day. But the relationship between the sun, the center of our solar system, the Earth and our Moon is complex, affecting many aspects of our life on Earth.

As discussed before, the Earth orbits the sun, held in place because of gravity. Making up 99% of the matter in our solar system, the sun has a diameter of 1,392,000 kilometers—1 million Earths could fit inside. The sun is 150 million kilometers away from the Earth. The sun is a giant hot ball of gases that produces energy by changing hydrogen into helium. This process of fusion makes the sun shine when the energy radiates out into space, making life possible on Earth.

The third planet from the sun, the Earth tilts on its axis at a 23.5 degree angle, and revolves around the sun in an elliptical orbit, which means it is not always the exact same distance from the sun.

Our time and calendar are dictated by the rotation of the Earth on its axis and its revolution around the sun. A single rotation on its axis makes one 24-hour day on Earth; a revolution around the sun takes one 365 $\frac{1}{4}$ -day year.

The tilt of the Earth's axis and its revolution around the sun causes the seasons. The 23.5 degree tilt of the Earth's axis remains constant as the Earth

orbits the sun. On one side of the orbit, the northern hemisphere is tilting toward the sun. At this point, the northern hemisphere has summer, while the southern hemisphere has winter. When the Earth is on the opposite end of its orbit, the southern hemisphere is pointing toward the sun. This hemisphere is then experiencing summer, while the northern hemisphere has winter. In spring and fall, both hemispheres are about the same distance from the sun.

A **solar eclipse** is seen from Earth when the moon passes between the sun and the Earth, casting a shadow that moves across a strip of Earth's surface. A lunar eclipse occurs when the Earth passes between the sun and moon, casting the Earth's shadow on the moon. Eclipses can be total or partial and are visible on only a small area of the Earth.

