

Motions of Earth and the Moon

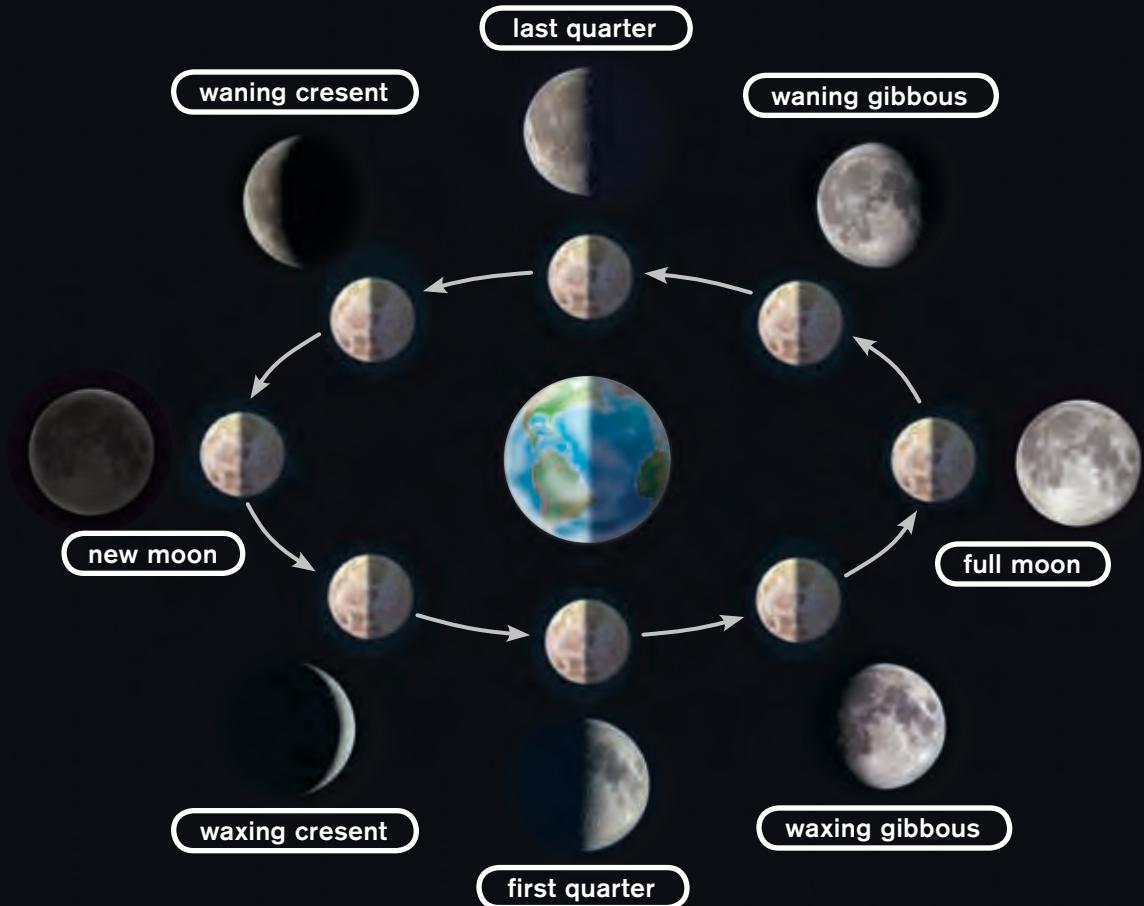
During each month, the shape of the moon seems to change. The different shapes are called **phases**. When the moon looks big and round, it is called a full moon. A new moon is when we cannot see the moon.

The moon may look like it changes shape. But that is only if you are looking at it from Earth. From space, you could see that the moon never changes shape. It is always round like a ball.



phases – the different shapes the moon seems to have during a month

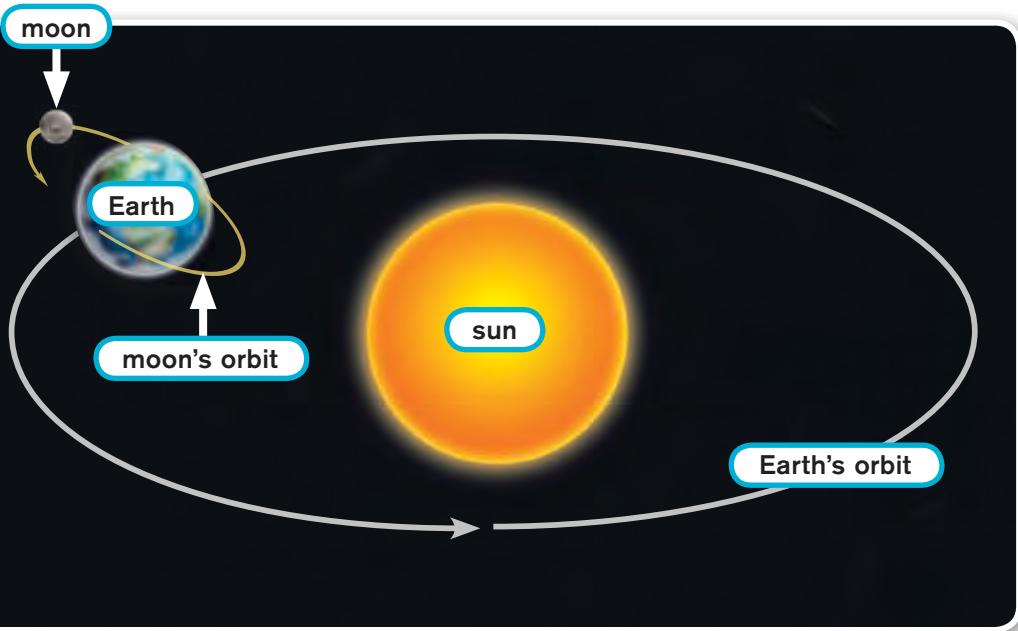
Phases of the Moon



We see phases of the moon because the moon **revolves** around Earth. The diagram shows that sunlight always lights up half of the moon. As the moon revolves, a different amount of this lighted half faces Earth each day. So from Earth, the moon looks like it changes shape. The shapes we see are the phases of the moon.

revolves – moves around something

KEY IDEA We see phases of the moon as the moon revolves around Earth.



▲ The moon revolves around Earth while both the moon and Earth revolve around the sun.

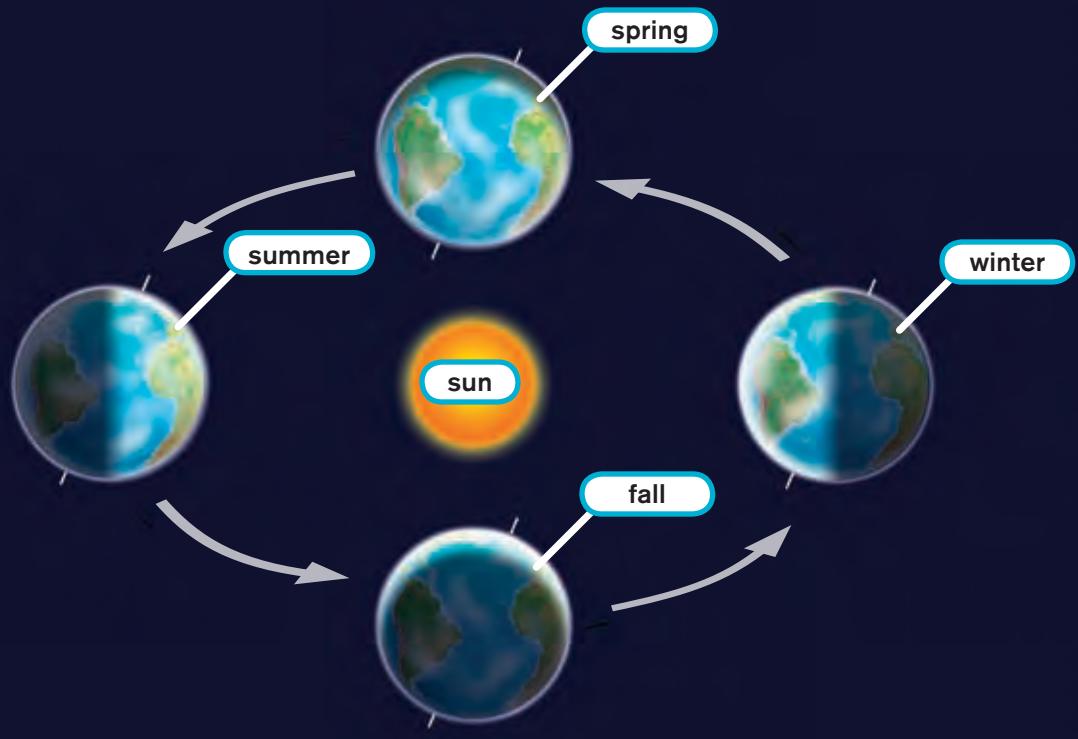
Moving Through Space

As the moon revolves around Earth, both Earth and the moon revolve around the sun. The path that Earth takes around the sun is Earth's **orbit**. The path that the moon takes around Earth is the moon's orbit.

A pulling force called **gravity** keeps the moon and Earth in their orbits. The pull of Earth's gravity keeps the moon in orbit around Earth. The pull of the sun's gravity keeps Earth and the moon in orbit around the sun.

orbit – the path of an object around another object

gravity – a pulling force between two objects



Earth is tilted as it revolves around the sun. That is because Earth has a tilted **axis**. Earth's axis is an imaginary line that runs through the center of Earth.

As Earth revolves around the sun, its tilt causes seasons. The part of Earth that is tilted toward the sun has summer because it gets more direct sunlight. The part of Earth tilted away from the sun has winter because it gets less direct sunlight. During spring and fall, Earth's axis is not tilted toward or away from the sun. All four seasons occur during one orbit. One complete orbit is one year.

axis – an imaginary line around which an object spins



It is daytime on the side of Earth facing the sun.

It is night on the side of Earth facing away from the sun.



Earth revolves around the sun. It also **rotates**, or spins, around its axis.

Earth's rotation causes day and night. Sunlight brightens the side of Earth facing the sun. It is day on this side. It is night on the side of Earth facing away from the sun. As Earth rotates, a place on Earth has day as it moves into the sunlight. It has night as it moves away from the sunlight.

rotates – spins on an axis

KEY IDEAS Earth's rotation causes day and night. Earth has seasons because Earth is tilted as it revolves around the sun.