



The Seasons and the Sun

Many people spend more time outside in summer than in winter. There is more daylight in summer, and the weather is often warmer.

During fall, the weather is cooler and there are fewer hours of daylight. Winter has the coldest weather and the fewest hours of daylight. In some places, snow falls.

By spring, there are more hours of daylight and the weather is warmer. Summer follows spring and the **cycle** of the seasons continues.

Why does the weather and amount of daylight change each season? The answer has to do with Earth's position and motion in space.

cycle – a thing that happens again and again in the same order

Rotation

Earth spins, or **rotates**, around an imaginary line called an **axis**. Earth's axis is tilted.

Because Earth is shaped like a ball, half of it is always facing the sun. On this half, it is daytime. The half that faces away from the sun is in darkness, and it is nighttime.

You can see in the picture that Earth rotates from west to east. This rotation makes the sun look like it rises in the east, moves across the sky, and sets in the west.

But the sun is not moving around Earth. Earth is rotating on its axis.

rotates – spins around an axis
axis – an imaginary line around which an object spins

▼ **Earth's rotation causes day and night.**

Explore Language

COMPOUND WORDS

day + time = daytime

night + time = nighttime



Revolution

In addition to rotating on its axis, Earth also **revolves** around the sun. This motion is called revolution. Earth makes one revolution around the sun in one year. As Earth revolves, the seasons change.

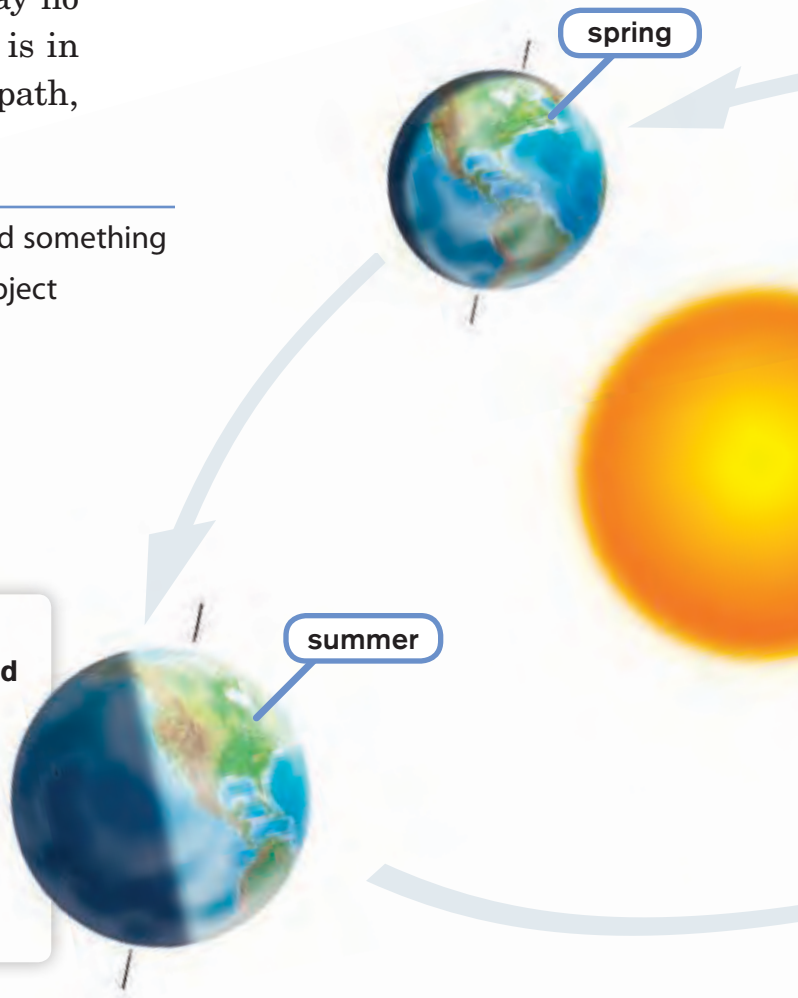
Notice that Earth's axis is tilted the same way no matter where Earth is in its **orbit**, or curved path, around the sun.

revolves – moves around something
orbit – the path of an object around another object

Because of this tilt, different parts of Earth receive different amounts of sunlight throughout the year.

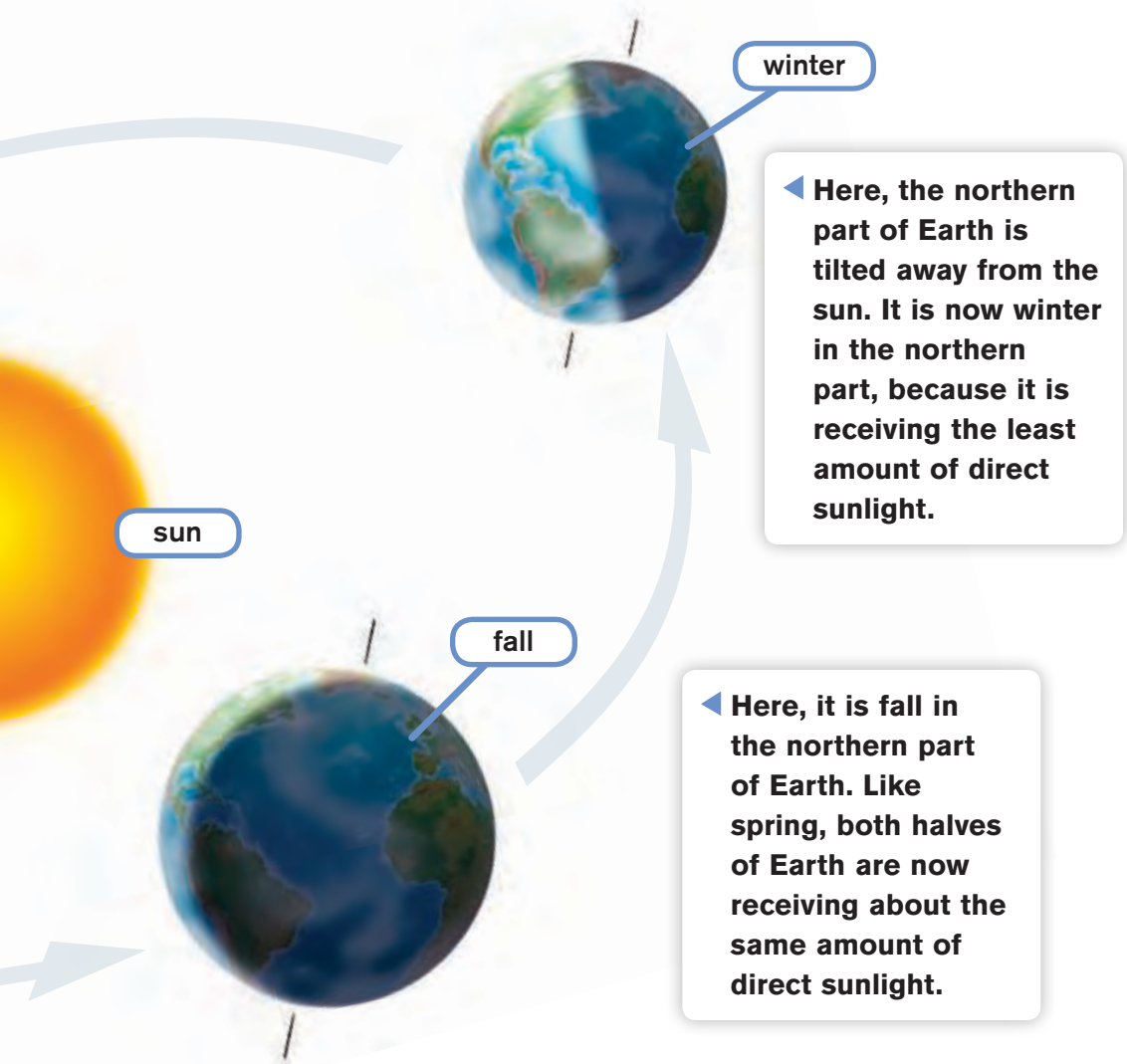
▼ Here, it is spring in the northern part of Earth. Now both halves of Earth are receiving about the same amount of direct sunlight.

► Here, the northern part of Earth is tilted toward the sun. It is now summer in the northern part, because it is receiving the most direct sunlight.



The diagram shows Earth's position in space at the beginning of each season for the northern part of Earth. Follow Earth's orbit in the diagram as you read about each season.

SHARE IDEAS Look at the diagram. **Explain** why the southern part of Earth has summer when the northern part has winter.



◀ Here, the northern part of Earth is tilted away from the sun. It is now winter in the northern part, because it is receiving the least amount of direct sunlight.

◀ Here, it is fall in the northern part of Earth. Like spring, both halves of Earth are now receiving about the same amount of direct sunlight.

Gravity Keeps Earth in Orbit

Year after year, Earth revolves around the sun. Why does Earth keep traveling in its orbit? The answer is **gravity**.

Gravity is a pulling force between two objects. The sun and Earth pull on each other. The sun's pull is larger, so its gravity keeps Earth in orbit.

How does pulling keep something moving around and around? Look at the girl. She pulls on the wire as she spins to keep the ball revolving around her.

When she lets go of the wire, she stops pulling and the ball travels away from her.

Earth would travel away from the sun if the sun's gravity did not pull on it. But gravity keeps Earth in orbit and continues the cycle of the seasons.

gravity – a pulling force between two objects



◀ This girl is practicing for a hammer throw competition.

KEY IDEAS The rotation of Earth causes day and night. Earth has seasons because Earth is tilted as it revolves around the sun. The sun's gravity keeps Earth in orbit.