

1.1 Earth's Rotation and Revolution

Main Idea Earth's tilt, rotation, and revolution cause weather changes and the four seasons.

In the summer, people who live in the northern parts of Iceland, Norway, Sweden, and Finland have more than 20 hours of daylight. In the winter, these same people have more than 20 hours of darkness. These long days and nights result from Earth's tilt and revolution around the sun.

Revolution and Rotation

The solar system is formed by the sun, Earth, and seven other planets. Earth, which is the third planet from the sun, revolves around the sun at a speed of about 67,000 miles per hour. It takes one year for Earth to make one revolution.

At the same time, Earth rotates on its axis, an imaginary line that runs from the North Pole to the South Pole through the center. Each rotation takes almost one day.

Critical Viewing Bathers in Iceland celebrate the summer solstice with a midnight swim in a hot spring. Based on the photo, what can you tell about the summer solstice in Iceland?

Earth tilts at an angle of about 23.5° . Because of this tilt, the Northern Hemisphere receives more direct sunlight for half the year, and temperatures are warmer. During these months, the Southern Hemisphere receives less direct sunlight, and temperatures are cooler.

As Earth continues around the sun, the Northern Hemisphere faces the sun less directly and temperatures are cooler. Meanwhile the Southern Hemisphere faces the sun more directly, and temperatures are warmer. This process creates the four seasons in both hemispheres.

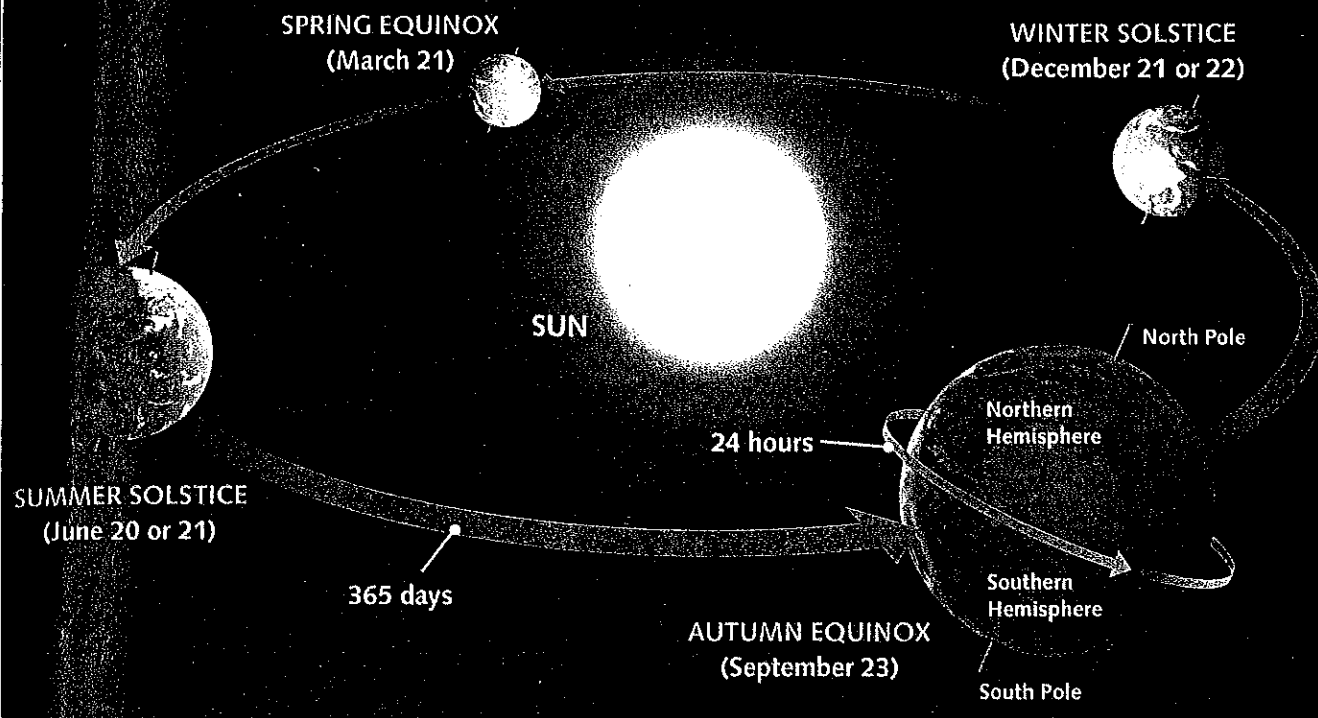
Summer and Winter Solstices

The exact moment at which summer and winter start is called a **solstice**. June 20 or 21 is the summer solstice in the Northern Hemisphere. It is the longest day of the year. Six months later, on December 21 or 22, the Northern Hemisphere has its winter solstice. This is the shortest day of the year.

The Southern Hemisphere is exactly the opposite. June 20 or 21 is its winter solstice and December 21 or 22 is its summer solstice.



EARTH'S FOUR SEASONS: NORTHERN HEMISPHERE



Spring and Autumn Equinoxes

The beginning of spring and autumn is called an **equinox**. Twice a year, the sun's rays hit the equator directly, and day and night are the same length. In the Northern Hemisphere, the spring equinox occurs around March 21, and the autumn equinox occurs around September 23. The Southern Hemisphere is exactly the opposite.

Before You Move On

Monitor Comprehension How do Earth's tilt, rotation, and revolution cause the seasons?

ONGOING ASSESSMENT

VIEWING LAB

- Analyze Models** According to the model above, when do the sun's rays hit the Southern Hemisphere most directly? This is the beginning of which season?
- Analyze Visuals** What happens to the sun in Iceland on the day of the summer solstice? Why does this happen?
- Compare and Contrast** How are the spring equinox and the autumn equinox alike?
- Make Inferences** What happens to the length of days in the Northern Hemisphere after the spring equinox?