

Our Place in Space

Have you ever looked up into the night sky and wondered what was out there? Throughout time, astronomers have gazed to the heavens, hoping to find clues about our place in the universe.

Long ago, people assumed that Earth was the center of the universe. They believed that the sun, moon, stars, and other planets orbited around it. Astronomers finally learned that Earth is one of at least eight other planets that travel around the sun.

Our Sun

The sun is a star at the center of the solar system. It isn't the biggest or brightest star in our galaxy, but it is the star closest to Earth. It is the largest body in our solar system: in fact, it contains 99.8 percent of the solar system's mass.

Like other stars, the sun is made up of hot hydrogen and helium gases. The temperature in its center is about 15 million degrees Celsius (27 million degrees Fahrenheit). The sun's mass gives it a powerful gravitational pull. That gravity keeps Earth and other planets of the solar system in place and orbiting around the sun.

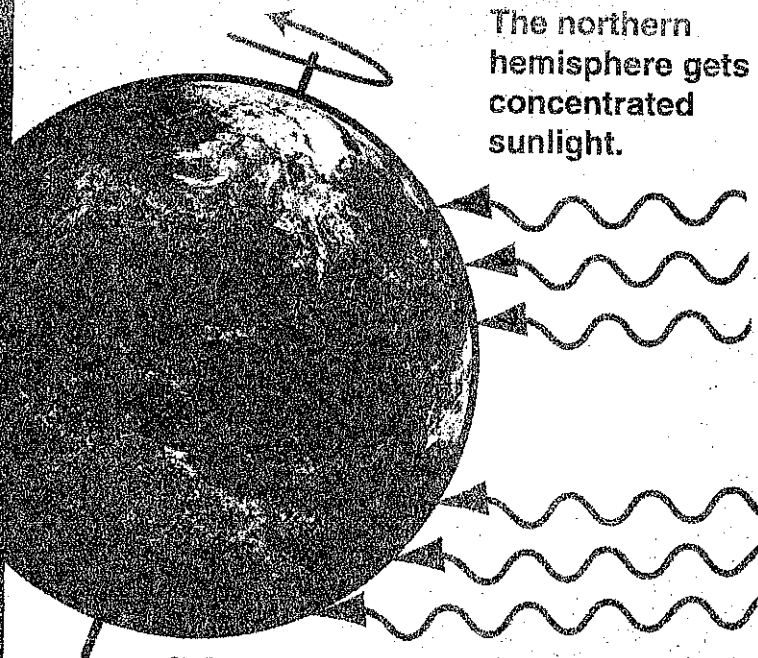
The sun, through its light and heat, is the primary source of energy on Earth. It's responsible for the growth of plants, winds, ocean currents, and the water cycle. Without the sun's energy, Earth would be very cold. It would be so cold that no living thing could survive.

The Four Seasons

Earth is tilted to one side as it orbits around the sun, and it is that tilt that causes the seasons. For part of the year, the northern hemisphere of Earth leans toward the sun and gets direct sunlight. So, it's summer there. At the same time, the southern hemisphere leans away from the sun and gets less sunlight. So, it's winter there.

the Sun

Summer:
The northern hemisphere gets concentrated sunlight.

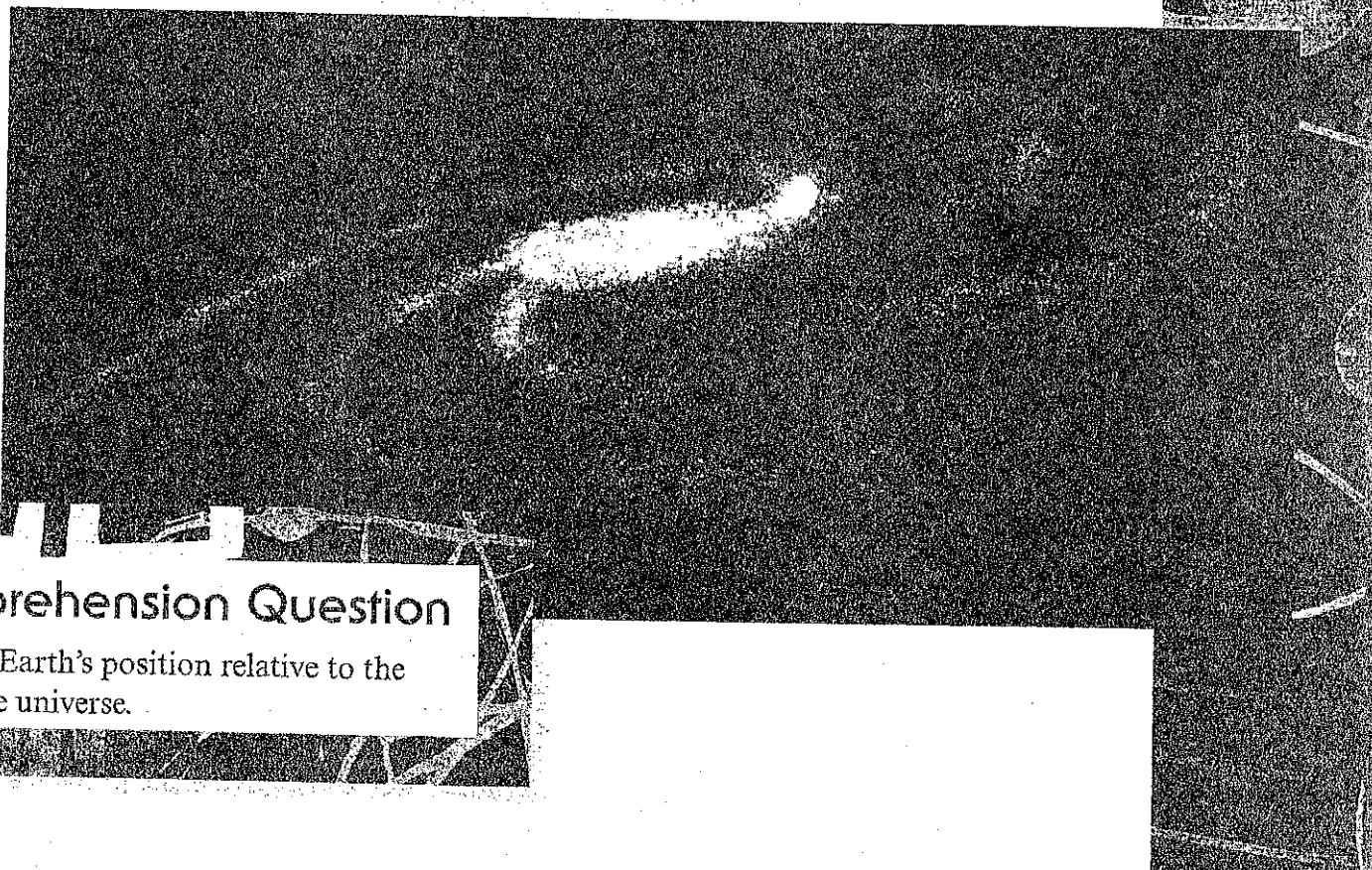


Winter:
The southern hemisphere gets sunlight spread out.

The tilt doesn't change. It is the position of the planet around the sun that changes. As Earth goes around the sun, different parts get more sunlight. So at one part of the year, it is winter in the northern hemisphere of the planet. At the opposite time of the year, the Earth is tilted differently and it is summer in the northern hemisphere.

Astronomers also now know that our solar system is almost 5 billion years old. It is located at the edge of the Milky Way galaxy. It is one of at least 100 billion galaxies in the universe. Each one of them has billions of stars! Our galaxy alone has about 200 billion stars.

The Milky Way is a spiral galaxy with many arms. On very dark nights, you can see the neighboring arm as a bright band in the sky. The galaxy is so wide that light would take 100,000 years to travel across it.



Comprehension Question

Describe Earth's position relative to the rest of the universe.