

# No Place Like Home

## What is special about Earth?

As far as scientists know, Earth is the only planet in the solar system that has the combination of factors needed to support life. Life as we know it requires liquid water and an energy source. Earth has both. Earth's atmosphere contains the oxygen that animals need to breathe. Matter is continuously cycled between the environment and living things. And a number of ecosystems exist on Earth that different organisms can inhabit.

## Earth Has Abundant Water and Life

Earth's vast liquid-water oceans and moderate temperatures provided the ideal conditions for life to emerge and flourish. Around 3.5 billion years ago, organisms that produced food by photosynthesis appeared in Earth's oceans. During the process of making food, these organisms produced oxygen. By 560 million years ago, more complex life forms arose that could use oxygen to release energy from food. Today, the total number of species of organisms that inhabit Earth is thought to be anywhere between 5 million and 30 million.

### Statistics Table for Earth

Distance from the sun	1.0 AU
Period of rotation	23 h 56 min
Period of revolution	365.3 days
Tilt of axis	23.45°
Diameter	12,756 km
Density	5.52 g/cm <sup>3</sup>
Temperature	-89 °C to 58 °C
Surface gravity	100% of Earth's gravity
Number of satellites	1

From space, Earth presents an entirely different scene from that of the other terrestrial planets. Clouds in the atmosphere, blue bodies of water, and green landmasses are all clues to the fact that Earth is a special place.

## Earth Is Geologically Active

Earth is the only terrestrial planet whose surface is divided into tectonic plates. These plates move around Earth's surface, which causes the continents to change positions over long periods of time. Tectonic plate motion, together with weathering and erosion, has erased most surface features older than 500 million years.

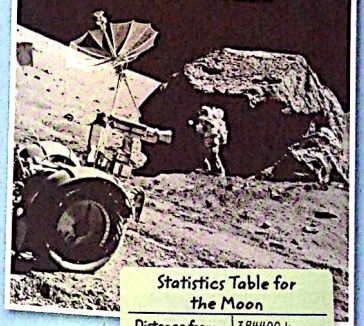
## Humans Have Set Foot on the Moon

Between 1969 and 1972, 12 astronauts landed on the moon. They are the only humans to have set foot on another body in the solar system. They encountered a surface gravity that is only about one-sixth that of Earth. Because of the moon's lower gravity, astronauts could not walk normally. If they did, they would fly up in the air and fall over.

Like Mercury, the moon's surface is heavily cratered. It is estimated that about 500,000 craters larger than 1 km dot the moon. There are large dark areas on the moon's surface. These are plains of solidified lava. There are also light-colored areas. These are the lunar highlands.

The moon rotates about its axis in the same time it orbits Earth. Therefore, it keeps the same side facing Earth. During a lunar day, which is a little more than 27 Earth days, the daytime surface temperature can reach 127 °C. The nighttime surface temperature can fall to -173 °C.

The moon is the only other body in the solar system where humans have been.



### Statistics Table for the Moon

Distance from Earth	384,400 km (0.0026 AU)
Period of rotation	27.3 days
Period of revolution	27.3 days
Axial tilt	1.5°
Diameter	3,476 km
Density	3.34 g/cm <sup>3</sup>
Temperature	-175 °C to 127 °C
Surface gravity	16.5% of Earth's gravity

## Visualize It!

12 Identify In the image, circle any signs of life that you see.

