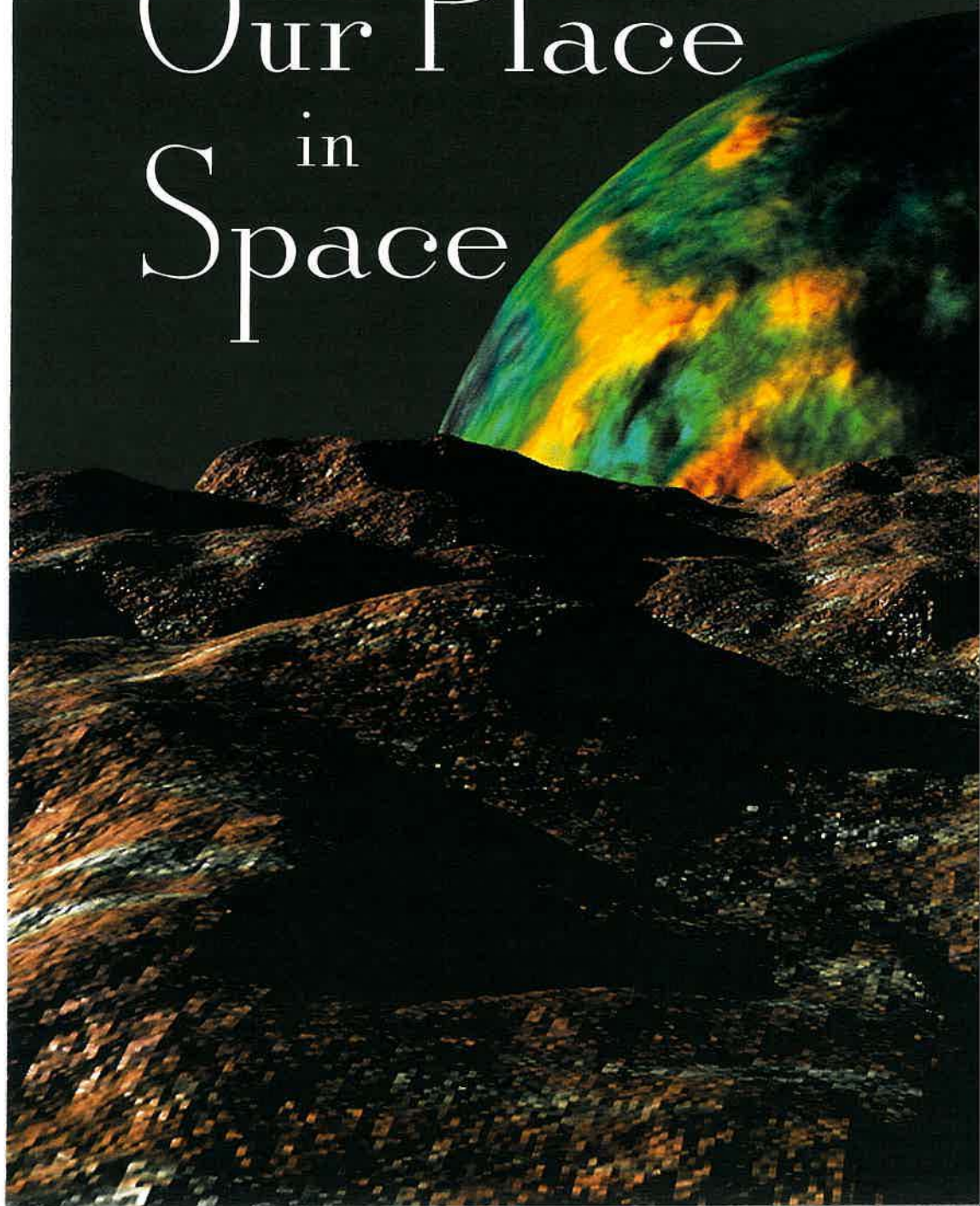


Our Place
in
Space

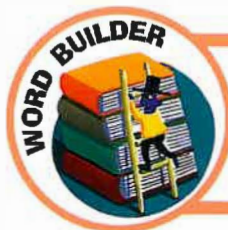


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Features



How did the planets get their names?
What do the names mean?
Find out with **Word Builder**.

Who was the first person to look at the sky
through a telescope? Find out on page 5.



Do you know how many space probes
the United States has sent to Jupiter?
The answer is on page 14.

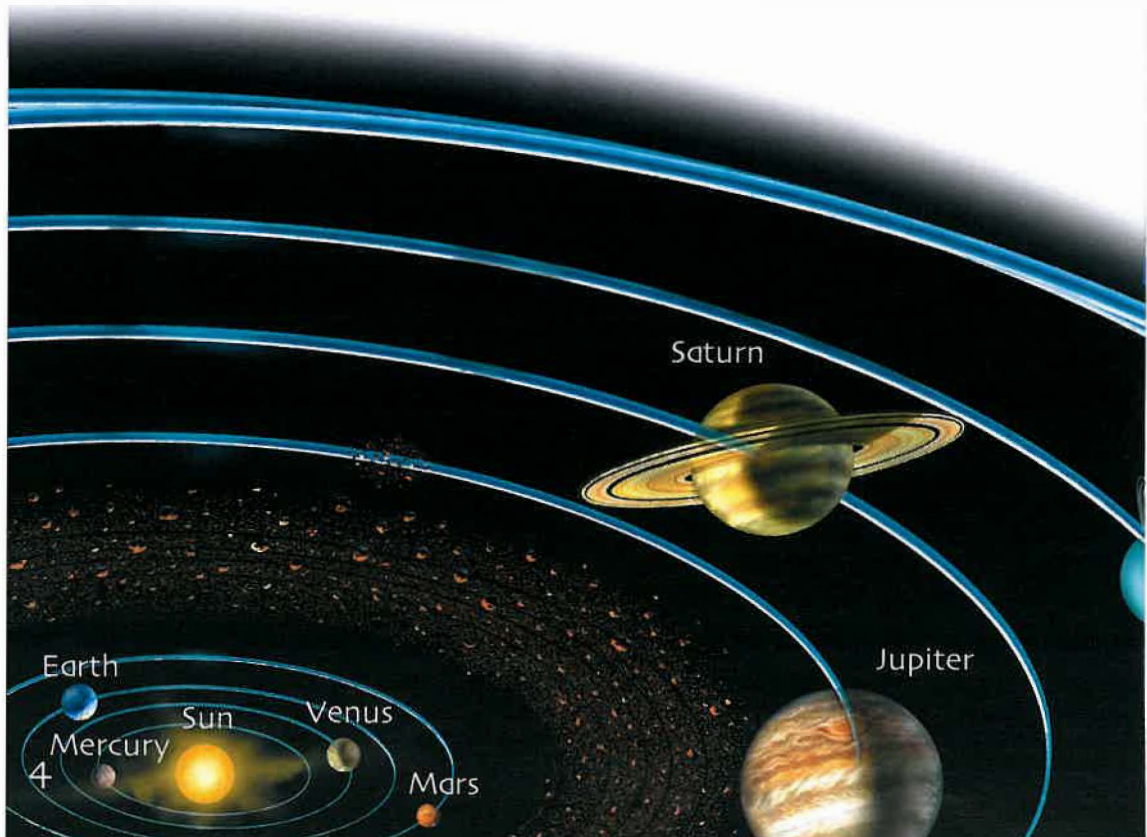
Have you ever heard of pictures in the stars?
Read about pictures people have seen in one
group of stars on page 21.



Families in the Sky

Earth is not the only planet in the universe. It is part of a family of eight planets called the **solar system**. The sun is in the centre of the solar system. The planets of the solar system travel in **orbits** around the sun.

The solar system is only a small part of a huge family of stars called a **galaxy**. The galaxy we live in is called the Milky Way.



PROFILE



Galileo Galilei (1564–1642) from Italy was the first person to look at the sky through a telescope. He discovered that Earth's moon is covered in craters and he spotted four of Jupiter's moons. He also found Saturn's rings, although he didn't know what they were. In 1610 Galileo published the fact that Earth travels around the sun.

Pluto
(no longer considered a true planet)

Uranus

Neptune

Mercury: 58 million
Venus: 108 million
Earth: 150 million
Mars: 228 million

Jupiter: 778 million

Saturn: 1,429 million

Uranus: 2,875 million

Neptune: 4,504 million

(Pluto: 5,900 million)

Sun

DISTANCE FROM THE SUN IN KILOMETRES

The Sun

The sun is an enormous star. Like other stars it is a huge ball of hot gas. The sun is very important to life on Earth. It gives us the light and heat we need to grow food and keep warm.

Scientists believe that planets close to the sun are too hot for living things. Those far from the sun are too cold. Earth is the third planet from the sun. This is one of the main reasons we have life on Earth.

Long ago many people thought the sun was a god.



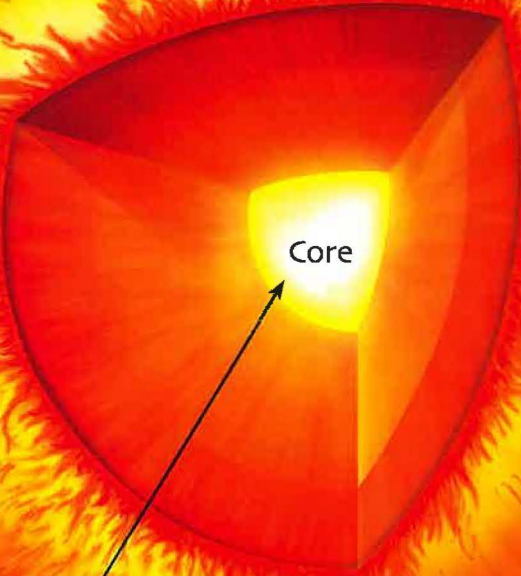
Greek sun god



Japanese sun god



Egyptian sun god



Core

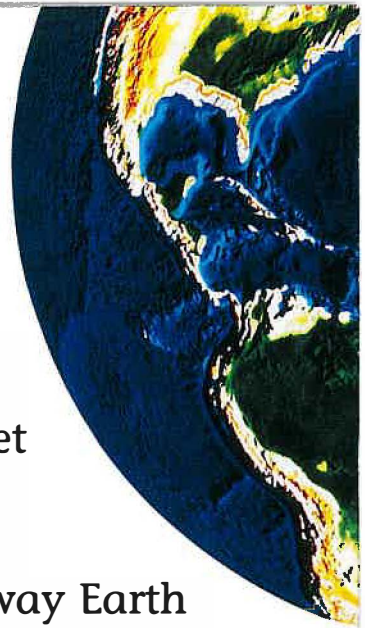


Energy is produced in the core of the sun.



The sun's heat and light make it dangerous to look at. Telescopes with special filters must be used when studying the sun.

Our Planet Earth



Earth's **atmosphere** is high in oxygen which most animals need to breathe. Many **astronomers** believe that Earth is the only planet in the solar system that has life.

Earth's seasons are caused by the way Earth tilts as it orbits the sun. Throughout the year the part of Earth that is closest to the sun has summer and the part that is furthest away has winter.

Southern summer
and northern winter



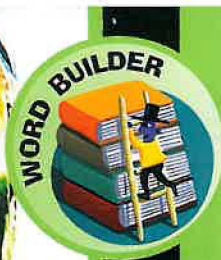
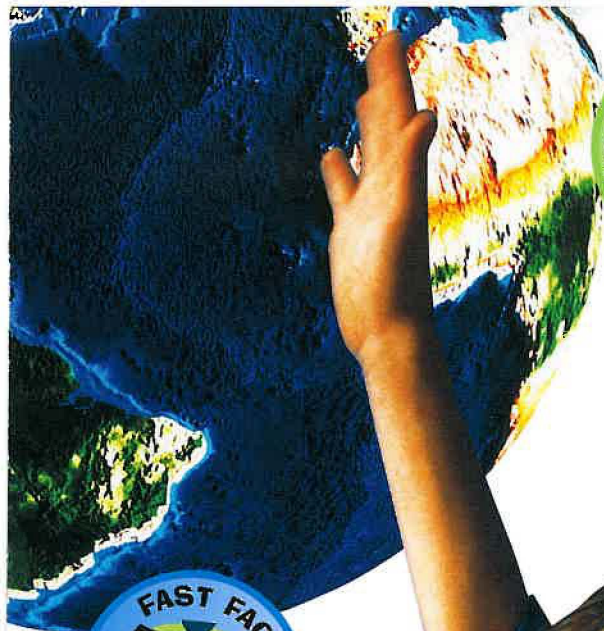
Northern summer
and southern winter



Sunlight

For half of the year, the southern part of Earth leans towards the sun. This is summer in the Southern Hemisphere.

For the other half of the year, the northern part of Earth leans towards the sun. This is summer in the Northern Hemisphere.

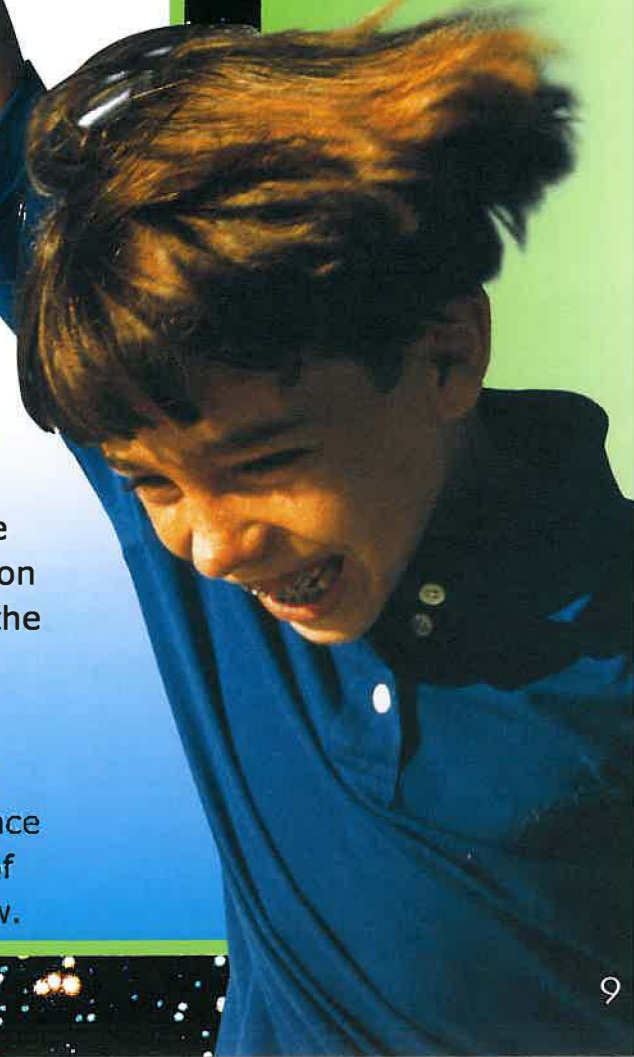


The word *Earth* comes from *eorthe* the Old English word for "ground".



Earth spins around every 24 hours. This spinning causes night and day. The part of Earth where you live faces the sun during the daytime. As your place on Earth turns away from the sun it becomes night.

To see how this works, spin around on a sunny day. As you spin your face moves out of the light of the sun and into shadow.



Earth's Moon

People know more about Earth's moon than anything else in space. The moon is about one-quarter the size of Earth and has no atmosphere at all. There is no oxygen to breathe, no water, no plants and no life.

The moon does not give off any light of its own. "Moonlight" is actually light from the sun that is reflected off the moon. The moon takes about 28 days to orbit Earth.



Footprint on Earth's moon



In 1969 Neil Armstrong became the first person to walk on the moon. Since then twelve astronauts have walked on the moon. The footprints they made may still be there in millions of years because there is no wind or rain on the moon to wipe them away.



New Moon

The surface of the moon facing Earth is in shadow so we can't see the moon.

Full Moon

The surface of the moon facing Earth is lit by the sun so we can see a full moon.

Waning Crescent

Only a small area of the moon can be seen. Soon there will be a new moon and the cycle will begin again.

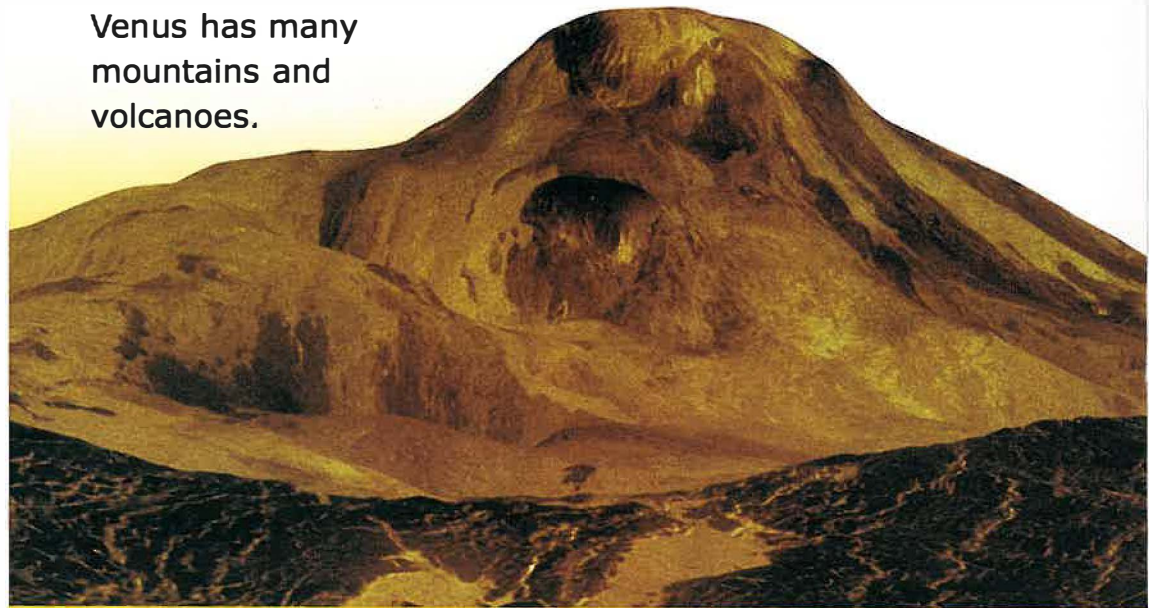


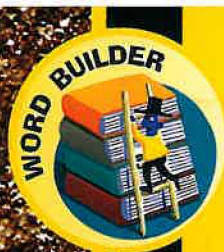
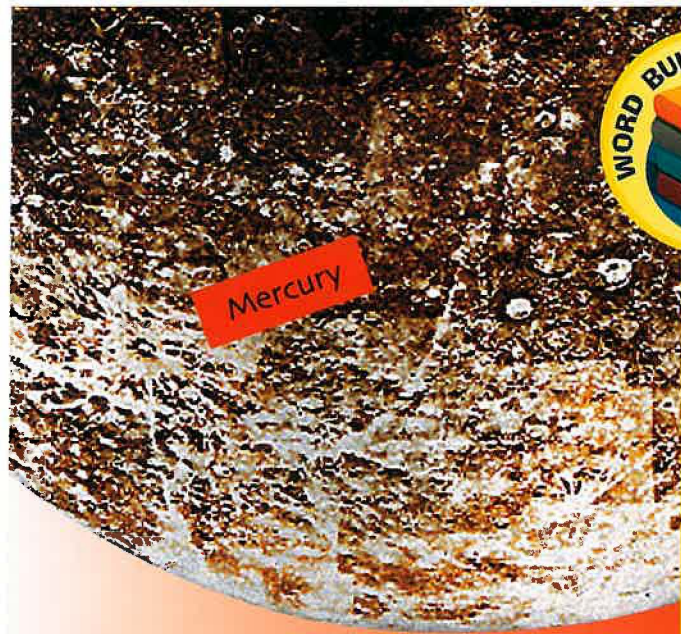
Mercury and Venus

Mercury is the closest planet to the sun so it is very hot. However, Mercury has very little atmosphere to trap the sun's heat, so the area furthest from the sun can be very cold.

Venus is the second closest planet to the sun. Because Venus has a thick atmosphere it traps the sun's heat. This makes Venus even hotter than Mercury.

Venus has many mountains and volcanoes.





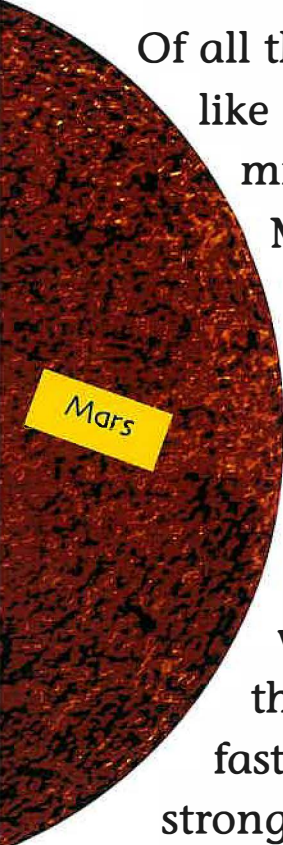
Mercury was named after Mercurius, messenger of the Roman gods.



Venus was named after the Roman goddess of beauty.



Mars and Jupiter



Of all the planets Mars is the most like Earth. A day on Mars is only forty minutes longer than a day on Earth.

Mars also has summer and winter seasons. However, people could not live on Mars because there is no oxygen in the atmosphere.

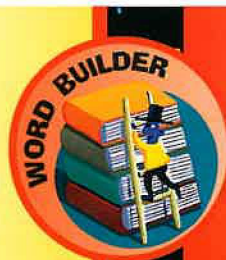
Jupiter is the largest planet in the solar system. It is a huge ball of gas with no solid land. Not only is Jupiter the biggest planet, it also spins the fastest. Jupiter's speed whips up strong winds and thunderstorms.

The United States has sent several space probes to Jupiter:

- **Pioneer 10** (1972)
- **Pioneer-Saturn** (1974)
- **Voyager 1** and **Voyager 2** (1979)
- **Ulysses** (1990–1992)
- **Galileo** (1989–2003)



Mars has two small moons. They are not like Earth's round moon. They are shaped more like potatoes!



Mars is sometimes called the red planet because it is covered in red rock. The Romans named the planet Mars after their god of war.



Jupiter was named after the king of the Roman gods. Before Jupiter became king he was the god of the sky, thunder and lightning.



Galileo



Pioneer-Saturn



Voyager

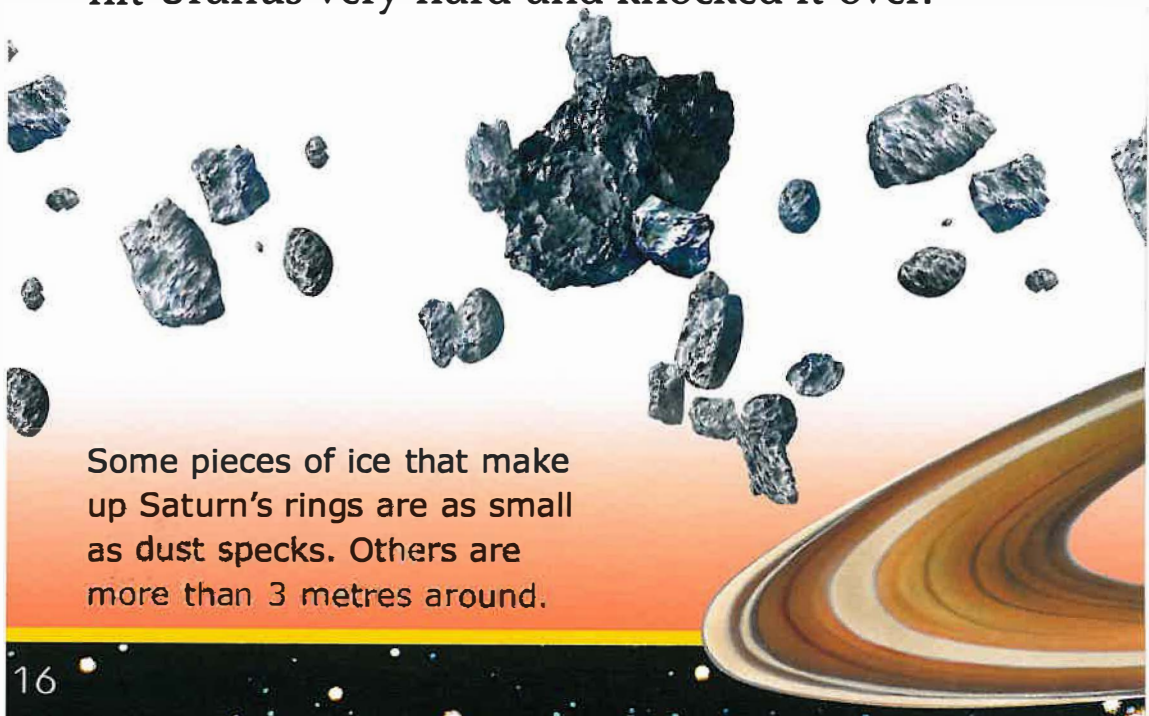


Jupiter

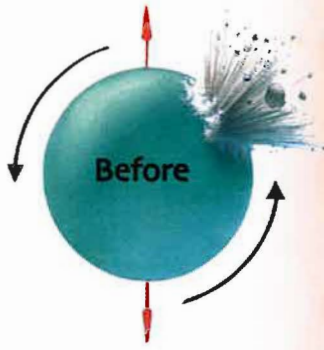
Saturn and Uranus

Saturn is the second largest planet in the solar system. Millions of tiny pieces of ice form rings that surround the planet. These rings stretch for thousands of kilometres into space.

For many years astronomers believed that Saturn was the last planet in the solar system. Then in 1781 Uranus was discovered. Uranus is tilted on its side. Scientists believe that millions of years ago a giant **asteroid** hit Uranus very hard and knocked it over.

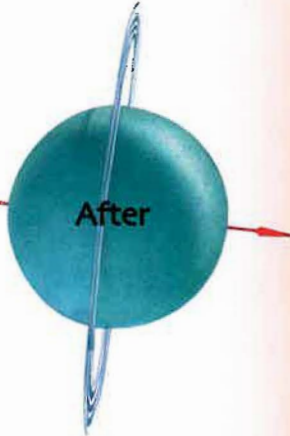


Some pieces of ice that make up Saturn's rings are as small as dust specks. Others are more than 3 metres around.



Before

An asteroid hits Uranus.



After

Uranus tips on its side. The pieces from the asteroid group together and form rings.

WORD BUILDER



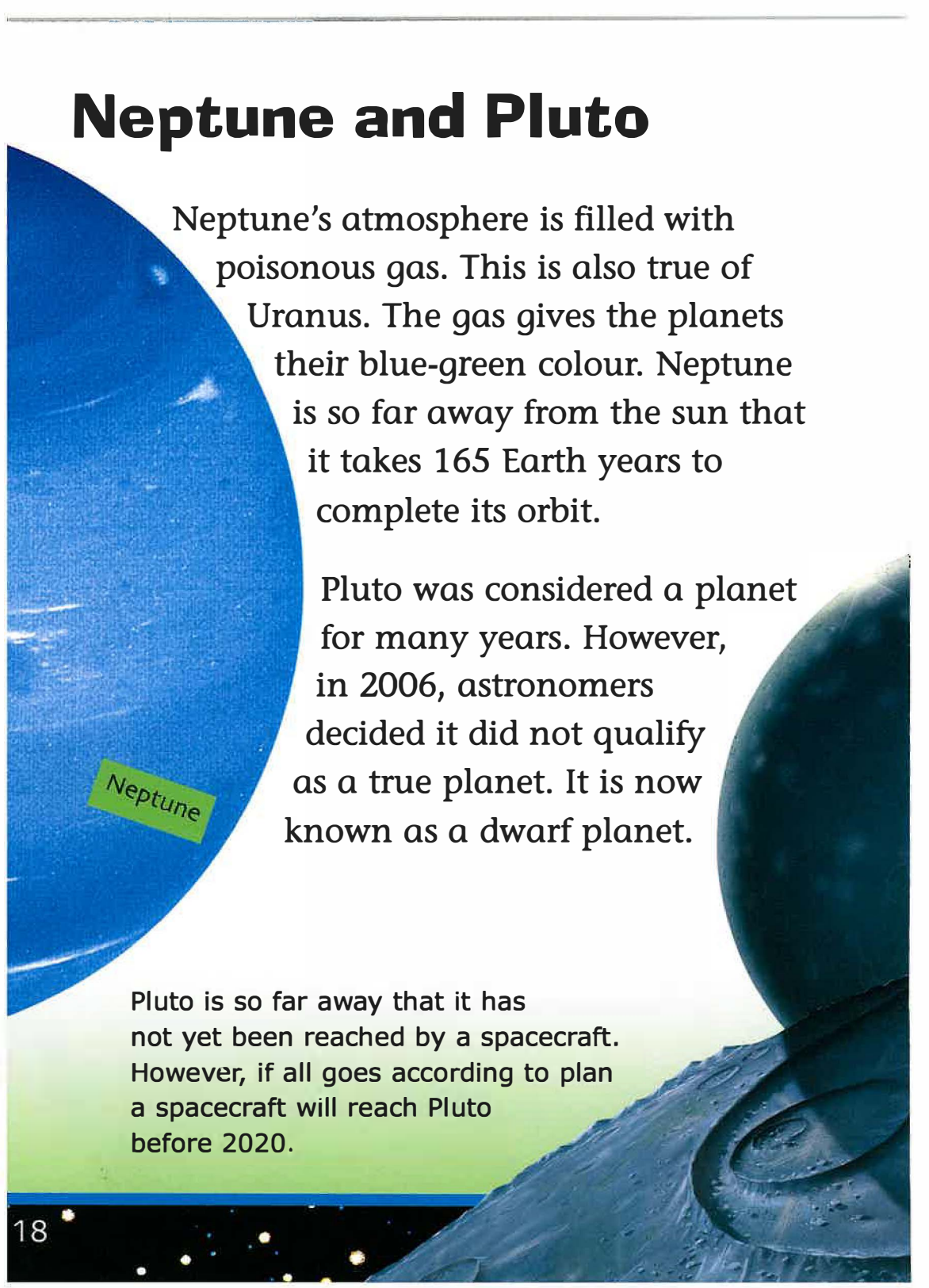
Saturn was named after the Roman god of the harvest.



Uranus was named after the Greek god of the sky.



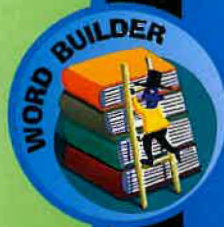
Neptune and Pluto



Neptune's atmosphere is filled with poisonous gas. This is also true of Uranus. The gas gives the planets their blue-green colour. Neptune is so far away from the sun that it takes 165 Earth years to complete its orbit.

Pluto was considered a planet for many years. However, in 2006, astronomers decided it did not qualify as a true planet. It is now known as a dwarf planet.

Pluto is so far away that it has not yet been reached by a spacecraft. However, if all goes according to plan a spacecraft will reach Pluto before 2020.



Neptune's largest moon, Triton, has active volcanoes. However, Triton's volcanoes erupt cold liquid nitrogen, not hot lava.

Neptune was named after the Roman god of the sea.



Pluto was named after the Roman god of the dead.



Pluto

Pluto's moon, Charon

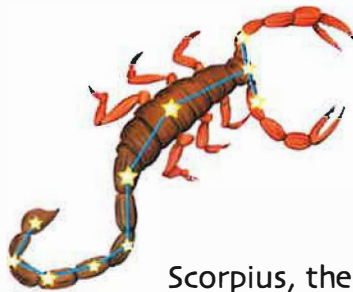
Starry, Starry Night

The sun is only one of about 100,000 million stars in the Milky Way. If you're out in the countryside, where there are no street lights, it is possible to see about 2,000 of these stars.

Since ancient times people have seen star pictures, or **constellations**, in the night sky. The constellations you can see depend on where you live, what time of night it is and where Earth is in its orbit around the sun.



Leo, the lion



Scorpius, the scorpion



The Big Dipper is well-known in the Northern Hemisphere.



The Southern Cross is well-known in the Southern Hemisphere.



Constellation of Orion



Orion, the hunter



People have seen different pictures in the same group of stars. Take the constellation of Orion, for example.

- The ancient Greeks saw these stars as Orion, the hunter.

- The Egyptians saw them as Osiris, their god of light.

- The Chinese imagined the stars as the warrior Tsan.

- An Amazon tribe saw the same stars as a giant crocodile.

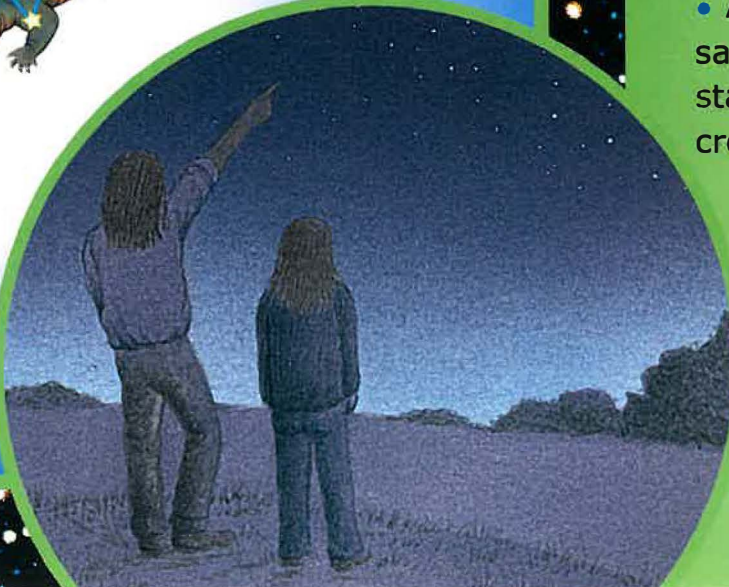


Osiris, Egyptian god of light

Tsan, Chinese warrior



Amazon tribe's giant crocodile



Glossary

asteroid – an object in the solar system that orbits the sun. A large number of asteroids circle the sun between Mars and Jupiter.

astronomer – a scientist who studies stars, planets and other objects found in space

atmosphere – the gas around a planet. Earth's atmosphere is high in oxygen.

constellation – a group of stars that look like the outline of a person, animal or object

galaxy – a very large group of stars. The galaxy we live in is called the Milky Way. Our galaxy got this name because the night sky can often look cloudy or milky.

orbit – the path followed by a planet as it travels through space. Each planet follows its own orbit around the sun. Moons also travel in orbits around planets.

solar system – the sun and the eight planets that travel around the sun. Also included in the solar system are the moons that travel around seven of the planets.

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Milky Way



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Discussion Starters

1 Scientists believe that Earth is the only planet in our solar system that has life.

However, the solar system is only a small part of the galaxy. Do you think there may be forms of life in other galaxies? Why or why not? If you think there may be some, what might they be?

2 If you could travel on a spacecraft to one of the planets in our solar system, which planet would you visit? What discoveries are you likely to make?

3 Most of the planets in the solar system were named after Roman gods. If you could name a new planet, what name would you choose? Why?

