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**I**N THIS ENCYCLOPEDIA, you will find out about the stars and planets—and especially the planet we live on: Earth. The different landscapes around us are shaped by natural forces: for example, rain, snow, ice, wind, rivers and even erupting volcanoes.

Each subject is presented with an introductory text to explain what it is about.

There are lots of things to see in the main illustration that accompanies each subject

Most (but not all) of the items pictured can be found somewhere in the main illustration.

The text that accompanies each item explains what it is and provides more information about it.

**Volcano**

A **Volcano** is an opening in the surface of the Earth through which hot, liquid rock erupts. Usually a volcano is a cone-shaped mountain. During an eruption, the volcano blasts out lava and ash. Some volcanoes are extinct and will never erupt again.

**Crater**  
When a volcano erupts, the top of the mountain is often destroyed in the force of the explosion. The wide hole that is left is the crater or caldera.

**Lava**  
Deep inside the Earth, the temperature is so high that even rock melts. Lava is hot, red liquid or molten rock. It flows out of the volcano and flows down its slope. When it is very hot, it is called black rock.

**Ash**  
As well as lava, a volcano often blows out huge clouds of ash and dust high into the air. Volcanic ash is a fine dust that has been carried up a few metres by the force of the explosion. When it falls back down to earth, it can cover everything in a layer several metres thick. Ash is very good for the soil. It makes it fertile.

**Geyser**  
A geyser is a fountain of hot water that erupts from a hole in the ground. A geyser usually erupts water that has collected under ground in heated by hot volcanic rocks.

**Hot spring**  
Hot water is high and often found near volcanoes. The water gushes from holes in the ground where it has been heated by volcanic rocks. Sometimes the water is mixed with mud and clay. This is known as mud pots. The mud often smells of rotten eggs!

**Earthquake**  
An earthquake is when the Earth trembles. Often the vibrations only last a few seconds. Most earthquakes are so weak that we don't notice them. But sometimes the Earth shakes so violently that the surface of the ground cracks, and houses and bridges collapse. An earthquake is most often caused by a sudden shift in the rocks under the surface. Building structures are so strong that they can hold up for a long time.



If you look very carefully, you will find a tiny comet in each of the main illustrations in this book. Turn to page 31 to find out where they are hidden.



## THE SOLAR SYSTEM

is made up of the Sun, eight major planets, several dwarf planets, moons, comets and countless smaller rocky objects. The planet we live on

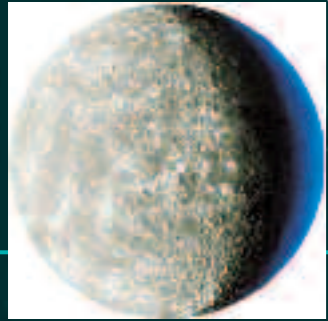
is called Earth. Along with the other planets, it orbits (goes round) the Sun. The other planets are called: Mercury, Venus, Mars, Jupiter, Saturn, Uranus and Neptune. Pluto is a much smaller world. It is now described as a dwarf planet.





## Mercury

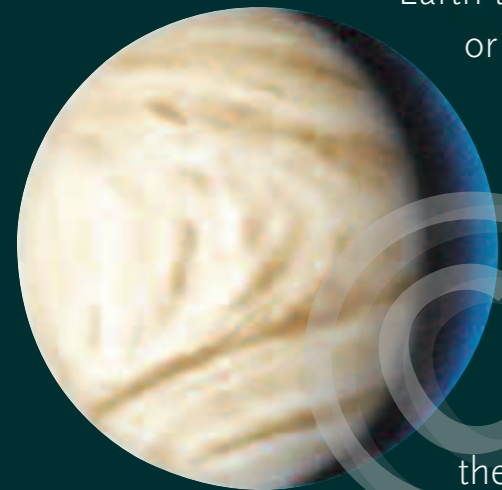
Mercury is the smallest planet in our Solar System. It is also the closest to the Sun. During the day, it is extremely hot on Mercury. During the night, however, it is bitterly cold. On Mercury's surface there are many deep craters. These were probably made by meteorites—boulders crashing down from space. When a meteorite struck the surface, rock and dust was blasted out in all directions.



## Venus

Venus is nearly the same size as Earth. However, people could not live there. It is extremely hot and its atmosphere is full of unbreathable carbon dioxide. Venus is covered by clouds all year round. These are made from droplets not of water but deadly sulphuric acid. Venus spins round, but in the opposite direction to the other planets. It spins very slowly.

Earth takes 24 hours, or one day, to spin round. A Venusian day lasts 243 Earth days. That's longer than its year, the time it takes to orbit the Sun.

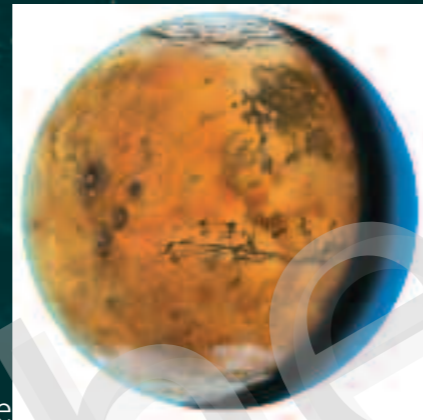


## Earth

The Earth is the only world in the Solar System where there are living things. Life is possible because there is liquid water on our planet. The Sun gives us also exactly the right amount of warmth so that it is not too hot and not too cold. Earth is surrounded by a covering of gas called the atmosphere. This gives us air to breathe, and protects us from bombardment by meteorites.

## Mars

Mars is known as the Red Planet because of the red dust that covers its surface. It is about half the size of the Earth. Scientists have discovered that water probably once flowed on Mars. There are dry river beds, deep ravines and ancient seashores on the planet. If Mars once had liquid water, it is possible life could have existed there in the past. Today, the only water on Mars is frozen at its north and south poles, or just beneath the ground in other areas.



## Jupiter

Jupiter is the largest planet in the Solar System. It does not have a hard, rocky surface like the Earth. The colourful bands of red, white, brown and yellow are thick clouds. These swirl around in Jupiter's stormy atmosphere. The Great Red Spot on Jupiter's surface is three times the size of Earth. The Spot is actually a giant storm that has been raging for 300 years.



## Saturn

Second only in size to Jupiter, Saturn is a huge planet. It is surrounded by vast rings made of lumps of rock and ice.

Saturn is also a "gas giant". Its thick atmosphere is made mostly of hydrogen. Saturn takes over 29 Earth years to complete an orbit of the Sun. But a day on Saturn is much shorter than on Earth as it spins much faster.



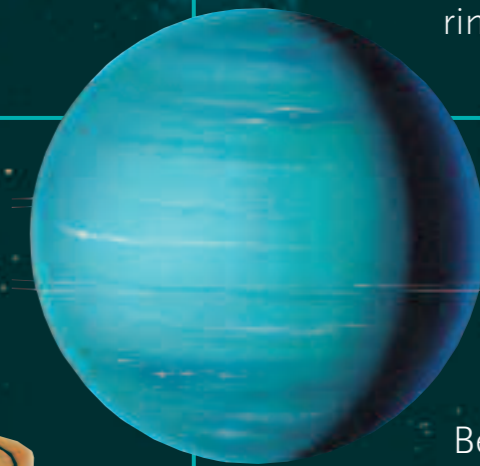
## Uranus

Uranus is the third largest planet. It is also made mostly of gas. Uranus is unusual because it spins round on its side. It takes 84 Earth years to orbit the Sun. Like Saturn, it is surrounded by rings, but they are very faint and narrow.



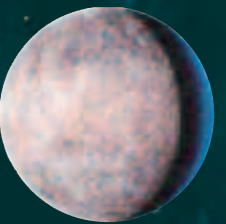
## Neptune

Neptune is the fourth largest gas giant. It also has some very faint, dark rings. Because it is so far from the Sun it is bitterly cold. One of its moons, Triton, is the coldest world in the Solar System.



## Pluto

Pluto is a dwarf planet. It is even smaller than our Moon. Seen from Pluto, the Sun would look like no more than a bright, distant star. Pluto's surface is made of gases that have frozen hard.





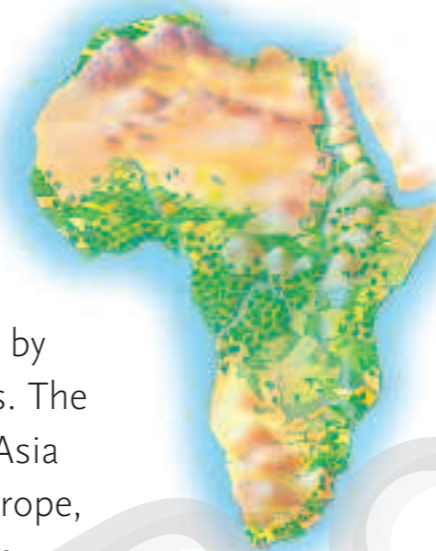
**T**HE EARTH, the planet where we live, is a sphere. But it is not perfectly round. It is fatter round its middle, the Equator, than at the Poles.

The Earth takes 24 hours to spin round once. It takes about 365 days to travel around the Sun. It is not perfectly upright, but is slightly tilted.



## Continent

Continents are the land masses of the Earth. They are separated from each other by oceans and seas. The continents are: Asia (the largest), Europe, North and South America, Africa (pictured here), Australasia and Antarctica. The continents make up less than one third of the Earth's surface. The rest is ocean. (See the map on pages 16-17.)

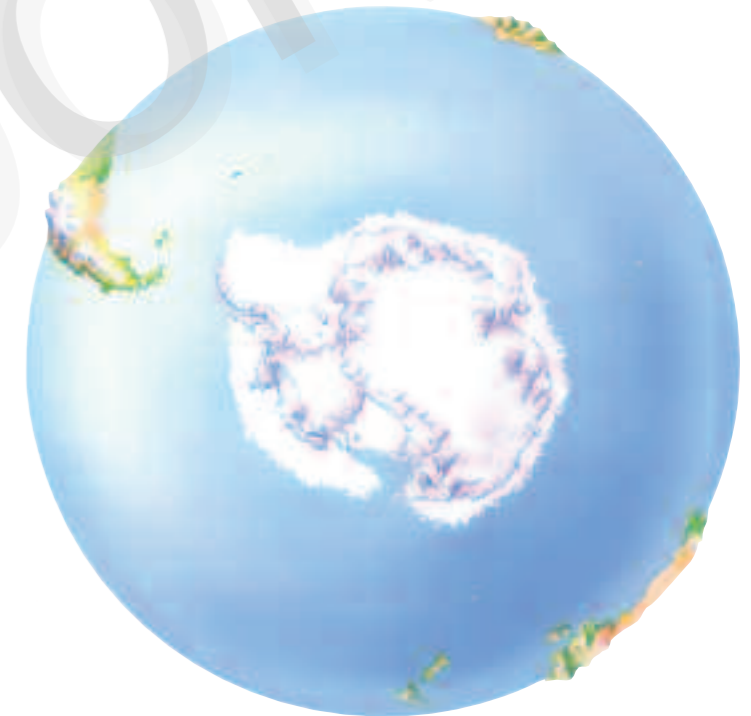


## Ocean

An ocean is a vast expanse of salt water. Earth has five oceans: Pacific Ocean (the largest), Atlantic Ocean, Indian Ocean, Arctic Ocean and Southern Ocean. Some areas of ocean close to land are called seas.

## The Poles

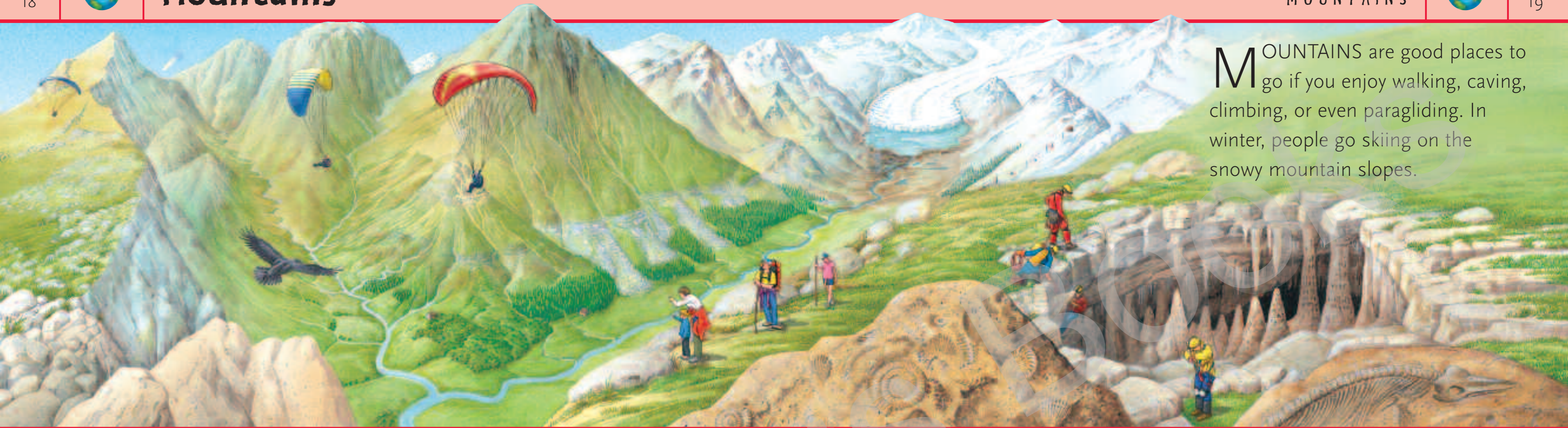
The top and the bottom of the Earth are known as the Poles. The Sun is lower in the sky at the Poles, so it is very cold throughout the year. In winter, it is dark all the time. The North Pole lies in the icy Arctic Ocean. The South Pole is on the continent of Antarctica.



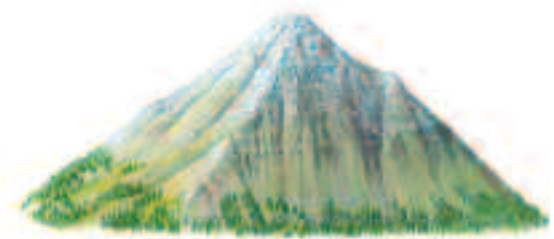
## Island

An island is an area of land that is surrounded by water, in the sea or in a lake. Some islands are actually the upper part of a mountain that rises from the ocean bed above the water's surface.





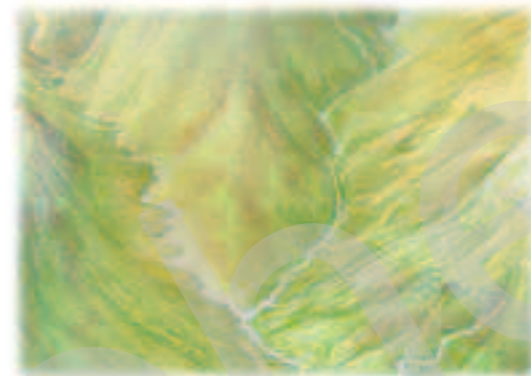
**M**OUNTAINS are good places to go if you enjoy walking, caving, climbing, or even paragliding. In winter, people go skiing on the snowy mountain slopes.



## Mountain

A mountain is larger, steeper and higher than a hill. The top is called the summit. It may be a sharp

peak. As you climb higher up a mountain, it gets colder. There are fewer and fewer trees. Near the summit, there may be bare rock. Often there is ice and snow.



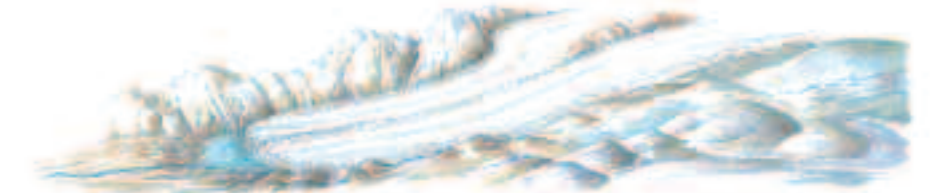
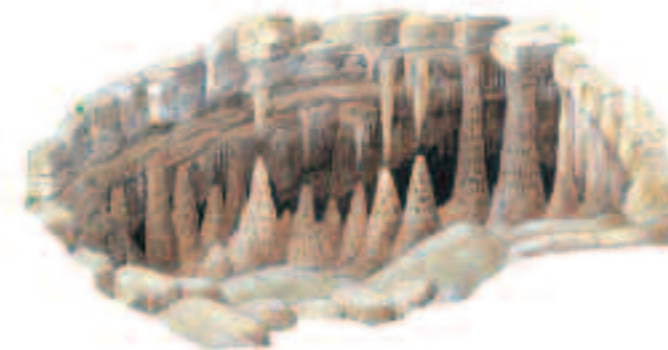
## Valley

A valley is a long basin. As they flow down mountain slopes, rivers and glaciers carve channels in the rocks. Over a very, very long time these channels widen into deep valleys. Valleys in highland areas usually have steep sides.

In lowlands, valleys are wide with gentle slopes and flat bottoms.

## Cave

Underground streams may form caves. Bit by bit, the water nibbles away at the rocks until large hollows open up. Sometimes the water dissolves the rock. When it drips from the cave ceiling it makes stone “icicles” called stalactites. Stalagmites are formed where the drips fall on the ground.



## Glacier

A glacier is a mass of ice that flows slowly down high mountain valleys. It is like a river made completely of ice. At the end of the glacier, its “snout”, the ice melts.

## Rocks

The Earth is made mostly of rock. If you look down a deep hole in your garden or in the street, you might see rock.

If you go to the mountains you can find rocks on the ground. Stones and pebbles are small pieces of rock.



## Fossil

A fossil is the remains of a living thing turned to stone. The plant or animal lived many millions of years ago. When it died, its soft parts rotted away. The hard parts—bones, teeth or shell—became part of the rock as it formed around them.

