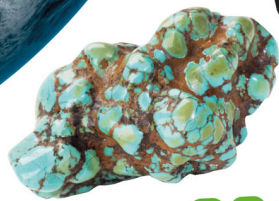
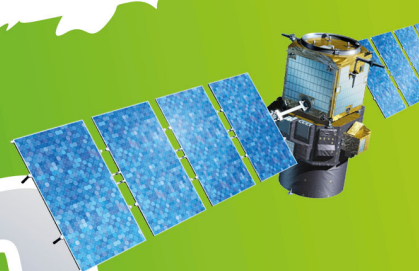


DK findout!

Earth



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 **findout!**

Earth



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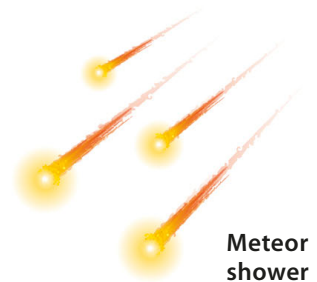
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Contents

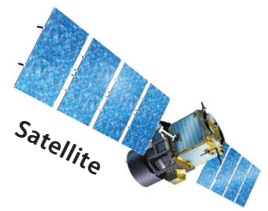
- 4 What is Earth?
- 6 Earth's atmosphere
- 8 Structure of the Earth
- 10 Moving Earth
- 12 Mountains
- 14 Volcanoes
- 16 Earthquakes
- 18 Deserts
- 20 Water
- 22 Oceans
- 24 Rivers
- 26 Glaciers



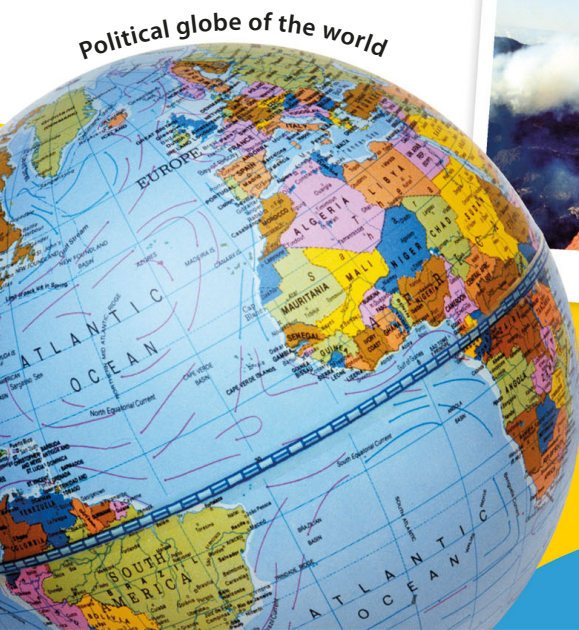
Meteor
shower



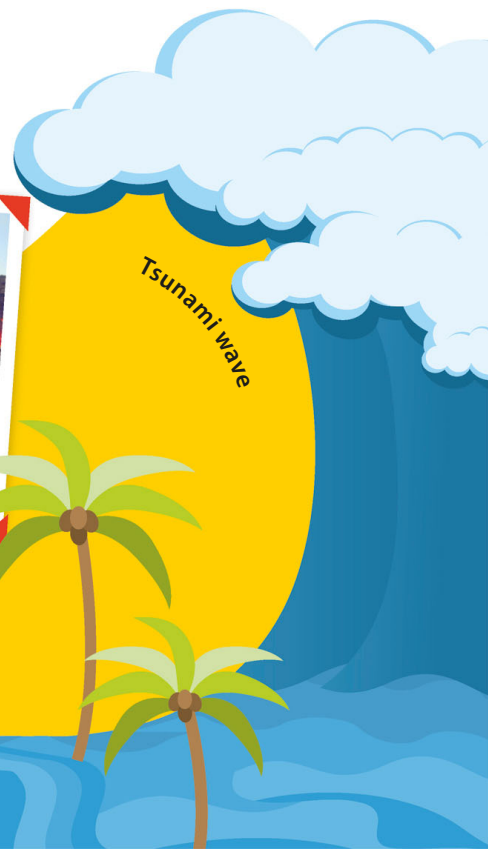
Li River, Guilin, China



- 28 Erosion and weathering
- 30 Caves
- 32 Record breakers
- 34 Biomes
- 36 Conservation
- 38 Weather
- 40 Seasons and climate
- 42 Climate change
- 44 Soil
- 46 Rock cycle
- 48 Rock uses
- 50 Continents
- 52 Rural and urban
- 54 Mapping the world
- 56 Meet the expert
- 58 Earth facts and figures
- 60 Glossary
- 62 Index
- 64 Acknowledgments



Mauna Loa, US



What is Earth?

Earth is our home. It is nearly 94 million miles (150 million km) from the sun, and is the fifth largest planet in our solar system. Earth is also the only planet in our solar system where water is found on the surface, which allows animals and plants to live here.

Solar system

Our solar system is made up of the sun and the eight planets that travel around it—Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune. The solar system also has moons, comets, asteroids, and meteoroids zipping through it. Scientists estimate that our solar system was formed about 4.6 billion years ago!

Day

In an area of the Earth that is facing the sun, it will be light, and therefore day.

Sun's rays

As the sun's rays reach Earth, they provide light and warmth. Without the sun, life on Earth would not exist.

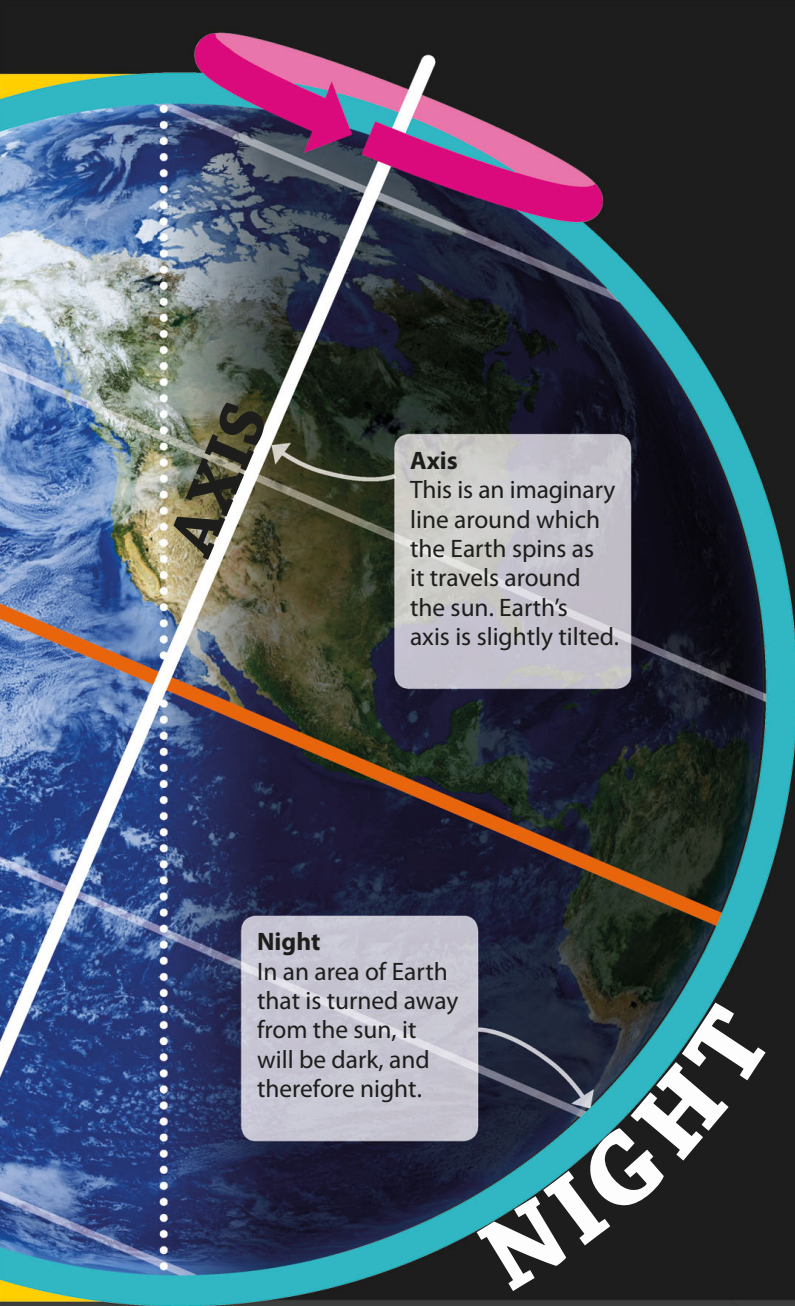
Equator

This is an imaginary line around the middle of the Earth. It lies halfway between the North and South Poles.

! WOW!

Our sun is huge—about **one million times bigger** than the Earth!





Axis
 This is an imaginary line around which the Earth spins as it travels around the sun. Earth's axis is slightly tilted.

Night
 In an area of Earth that is turned away from the sun, it will be dark, and therefore night.

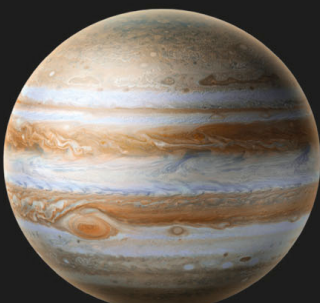
Earth's story

It is thought that Earth, and the other planets, formed as gravity forced material in clouds of gas and dust together, creating clumps of rock. These gradually grew bigger to form planets. Over time, the conditions on Earth evolved to support life.

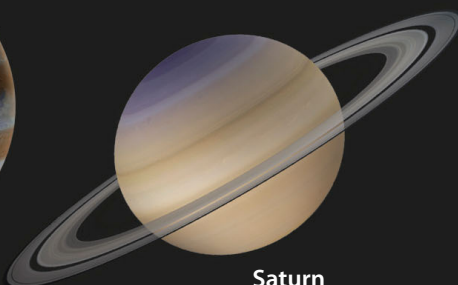
Earth's orbit

This is the path that the Earth takes as it travels around the sun. Earth's orbit does not form a perfect circle. It is a slightly flattened circle, or oval. Earth takes 365 days, or a whole year, to make one complete journey around the sun.

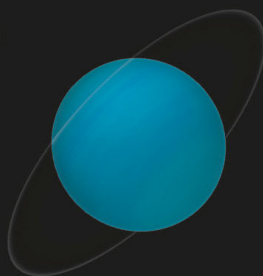
The number of days it takes Earth to orbit the sun



Jupiter



Saturn



Uranus



Neptune

Exosphere

This is the highest layer of Earth's atmosphere, where it merges into space. Only a few, very thin wisps of gas are found this high above our planet. It would be impossible to breathe here!

Earth's atmosphere

Earth is surrounded by a thick layer of gases, called the atmosphere. These gases protect Earth from the sun's rays, keeping temperatures on our planet at a comfortable level. Earth's atmosphere is divided into a number of distinct layers. At the outer edge of the atmosphere, there is no clear boundary. It just fades into space.

370-6,000

Satellites

These orbit Earth in the thermosphere and exosphere. We use them to make phone calls and watch TV. Scientists also use satellites to find out more about space.



Thermosphere

Unlike in other layers of Earth's atmosphere, temperatures here increase as you go higher, some parts rising to 3,600°F (2,000°C)! Satellites, including the International Space Station, orbit Earth in the thermosphere.

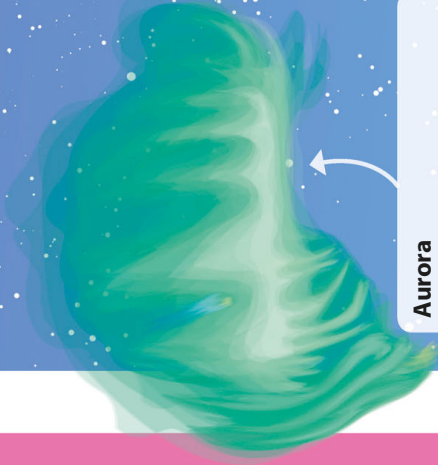
50-370

! WOW!

Without some of the gases in its atmosphere, Earth would be **too cold to live on!**

Aurora

These bright lights appear in the thermosphere when particles from the sun fall into Earth's atmosphere.



Mesosphere

The top of the mesosphere is the coldest part of the Earth's atmosphere, with temperatures of -226°F (-143°C). Gases here are thick enough to slow down meteors, causing them to burn up.

Stratosphere

The air in this layer is very dry and still. The ozone layer, which protects plants and animals on Earth from dangerous ultraviolet rays that are given off by the sun, lies in the stratosphere.

Troposphere

The gases found in the troposphere make up the air that we breathe. Therefore, life exists in this layer. Clouds form here, and it is where most of our weather occurs.

Meteors

These are bits of matter from outer space that burn up on entering Earth's atmosphere, creating streaks of light. They are also called shooting stars.

Sun's rays

Reflected rays

Weather balloons

Scientists launch these to collect information about conditions in Earth's atmosphere that affect the weather, such as temperature and air pressure.

Ozone layer

This thin band, running across the stratosphere, contains a large amount of ozone, a gas that absorbs ultraviolet (UV) rays from the sun. UV rays cause sunburn, and can cause skin cancer.

Mountains

Some of Earth's highest mountains extend quite a way into the troposphere.

Planes

Planes usually fly in the troposphere, but may go up to the edge of the stratosphere.

30-50

10-30

0-10

DISTANCE FROM EARTH IN MILES

Structure of the Earth

Planet Earth is made up of a number of different layers. Some of these are solid, while others are liquid or a mixture of both. Knowing about Earth's structure will help you understand what is happening on the surface—where you live.

Looking under the surface

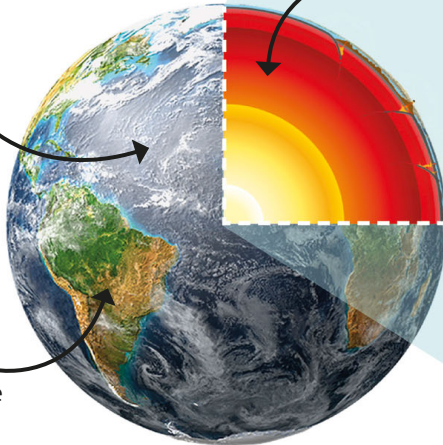
If you could slice a section out of the Earth, you would see its very different layers.

Water

Seas and oceans cover about 71 percent of Earth's surface.

Land

Just 29 percent of Earth's surface is land, which is split up into continents.

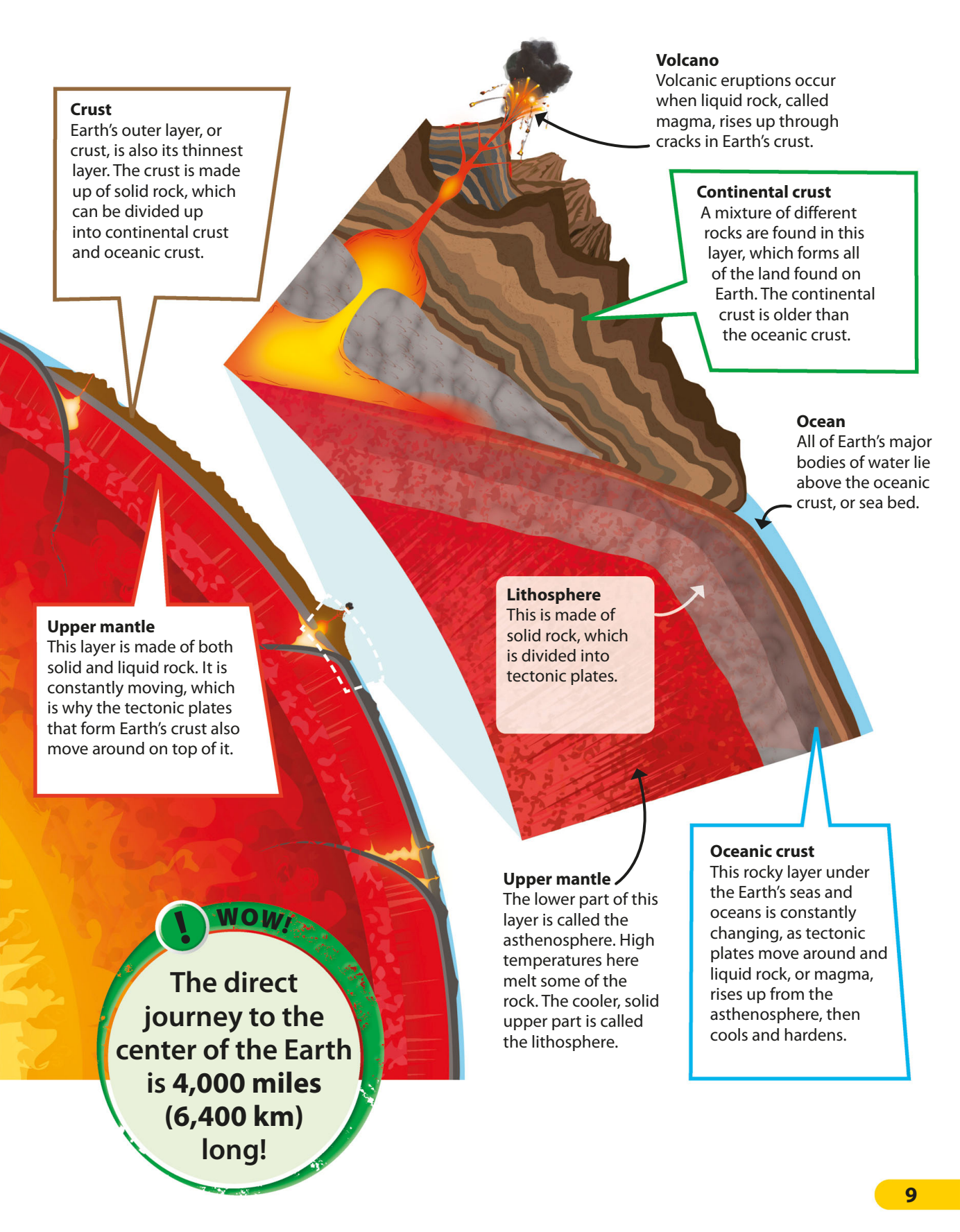


Slice of section

Inside and outside

Ocean and land cover Earth's surface, but inside are many complex layers.





Crust
Earth's outer layer, or crust, is also its thinnest layer. The crust is made up of solid rock, which can be divided up into continental crust and oceanic crust.

Volcano
Volcanic eruptions occur when liquid rock, called magma, rises up through cracks in Earth's crust.

Continental crust
A mixture of different rocks are found in this layer, which forms all of the land found on Earth. The continental crust is older than the oceanic crust.

Ocean
All of Earth's major bodies of water lie above the oceanic crust, or sea bed.

Upper mantle
This layer is made of both solid and liquid rock. It is constantly moving, which is why the tectonic plates that form Earth's crust also move around on top of it.

Lithosphere
This is made of solid rock, which is divided into tectonic plates.

Upper mantle
The lower part of this layer is called the asthenosphere. High temperatures here melt some of the rock. The cooler, solid upper part is called the lithosphere.

Oceanic crust
This rocky layer under the Earth's seas and oceans is constantly changing, as tectonic plates move around and liquid rock, or magma, rises up from the asthenosphere, then cools and hardens.

! WOW!
The direct journey to the center of the Earth is 4,000 miles (6,400 km) long!

Moving Earth

Earth's crust is divided up into large pieces called tectonic plates. These plates move around on the molten rock under them. Where the edges of these moving plates meet, the Earth's crust is unstable, and earthquakes and volcanic eruptions occur. Mountains may also form there.

KEY

All Earth's tectonic plates have names. The color of the line along their edges tells you what type of boundary they have.

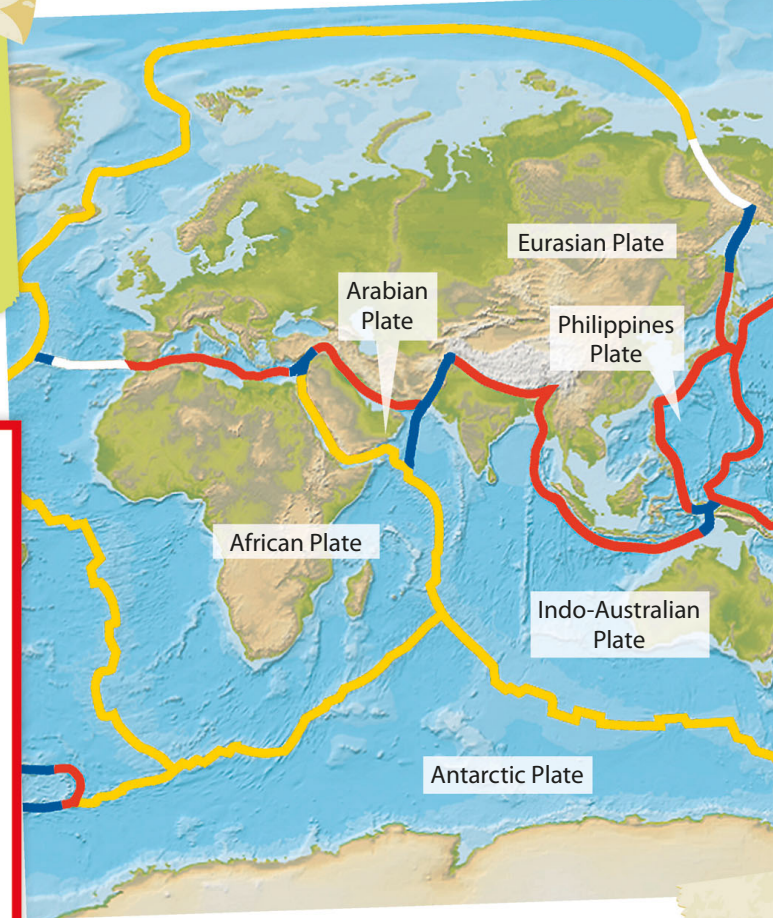
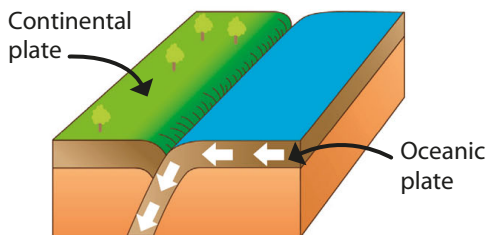
-  **Convergent**
-  **Divergent**
-  **Transform**

Plate boundaries

These are where the edges of tectonic plates meet. There are three main types—convergent, divergent, and transform boundaries. They differ in how the plates involved meet.

Convergent boundary

Here, two plates move toward each other. They may push together, forming mountains. But, if one plate gets pushed under the other, a volcano can form.



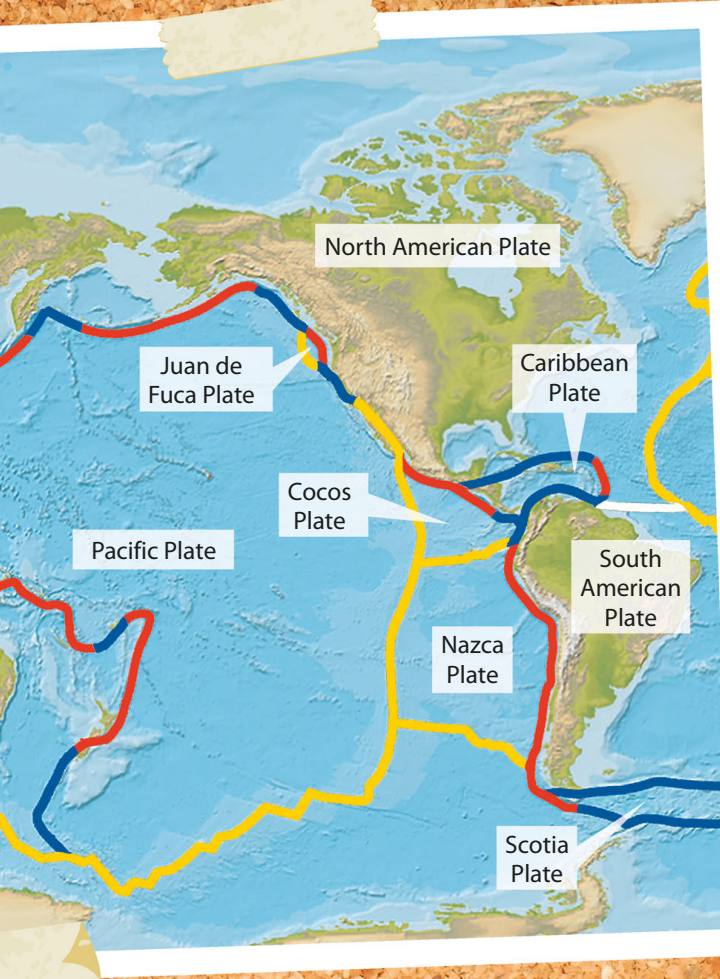
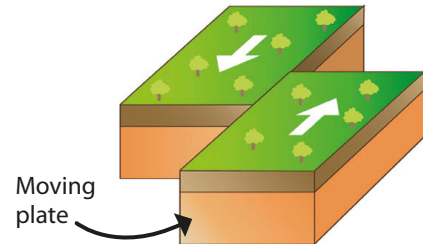
Ring of Fire

This area in the Pacific Ocean is one of the most unstable parts of the Earth's crust. Here, the tectonic plates move around a lot, causing some of the world's worst earthquakes. It is also where there are many active volcanoes.



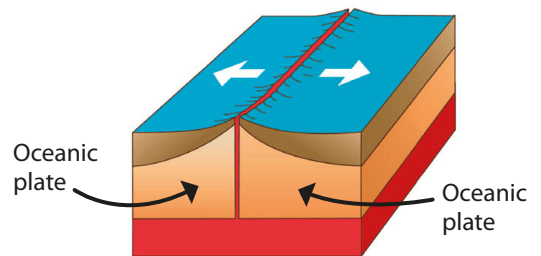
Transform boundary

When two plates rub against each other, this can cause an earthquake. They may slide by in opposite directions or move in the same direction at different speeds.



Divergent boundary

Here, plates move away from each other, and plate material forms in the gap left between them. When this happens under the ocean, new ocean floor is created.



Mountains

Mountains are formed when the Earth's tectonic plates move and collide with one another. As the plates continue to move, magma and land may be pushed up, forming mountains.



FACT FILE

- » **Name:** Sierra Nevada
- » **Height:** 14,494 ft (4,418 m)
- » **Location:** US

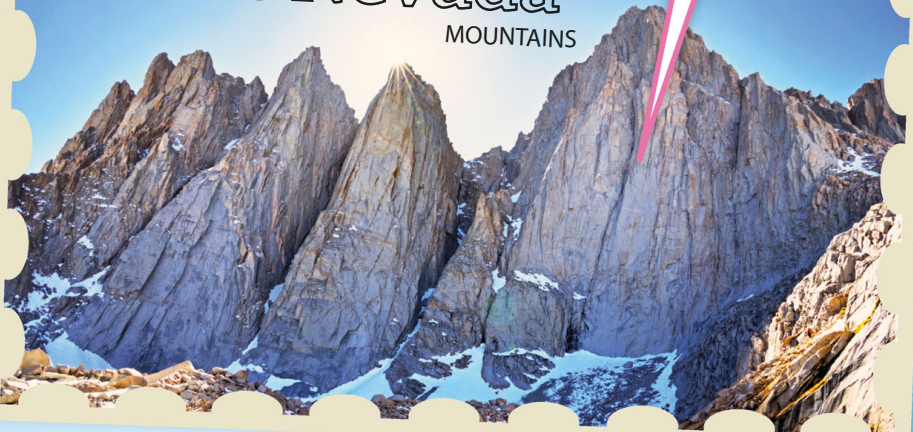


Fault-block mountains

Cracks in the Earth's crust can create massive blocks of rock that then move apart. As they move, one block may slide under another, pushing it up. This leaves large blocks of rock sticking up, high above the Earth's surface. These are fault-block mountains.

Sierra Nevada

MOUNTAINS



Dome mountains

When large amounts of the magma under the Earth's crust bubble up toward the surface, layers of rock above the magma are pushed up to form dome mountains. The inside of these mountains is filled with magma that has cooled and hardened.

GREETINGS FROM

Puy de Dôme



WISH YOU WERE HERE...

Himalayas



FACT FILE

- » **Name:** The Himalayas
- » **Height:** 29,029 ft (8,848 m)
- » **Location:** Nepal



Fold mountains

These are the most common type of mountain. They form when two or more tectonic plates are pushed together, causing layers of rock on the seafloor to crumple and fold. Over millions of years, these folded layers are slowly pushed up higher to form mountains.

Volcanic mountains

A volcanic eruption occurs when magma bubbles up and eventually erupts through a crack in the Earth's crust. This causes molten rock, known as lava, to flow over the land, before it cools and hardens. Further eruptions create more layers of hardened lava, which build up to form a mountain.

FACT FILE

- » **Name:** Puy de Dôme
- » **Height:** 4,806 ft (1,465 m)
- » **Location:** France



FACT FILE

- » **Name:** Mount Kilimanjaro
- » **Height:** 19,340 ft (5,895 m)
- » **Location:** Tanzania



MOUNT Kilimanjaro



Volcanoes

Volcanoes form when magma, a mixture of hot gas, ash, and melted rock, erupts from a crack in the Earth's surface. The melted rock, called lava, flows out and hardens. As layers of lava build up, the volcano gets bigger. A volcano can be active, dormant, or extinct.

! WOW!

Most of Earth's active volcanoes lie hidden from view, under the ocean!

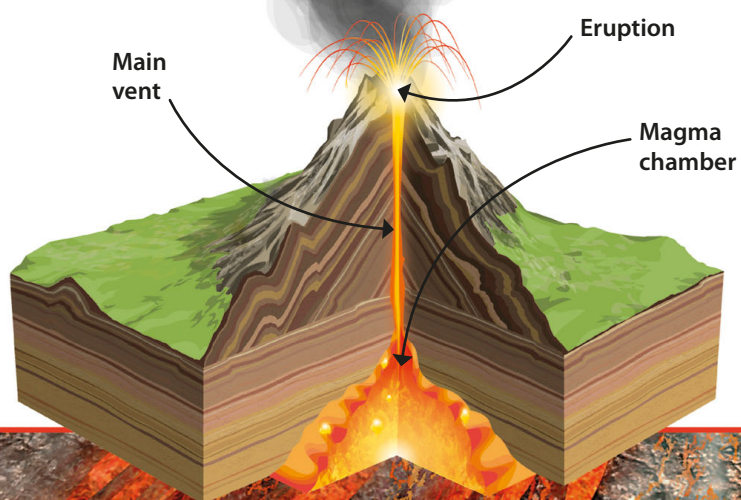


STRATOVOLCANO
Mount Fuji, Japan

Stratovolcanoes are tall and cone-shaped, with steep sides. They are made up of lots of layers of lava and ash that have cooled and hardened. Their eruptions can be very powerful and dangerous.

Inside a volcano

When pressure in the magma chamber under a volcano gets too high, the magma is forced up and out of the main vent. This is called an eruption. The force of this eruption blows rock off the top of the volcano, creating a bowl-shaped hollow, the crater. In some volcanoes, magma also erupts from smaller vents that branch out from the main vent.



SHIELD

Mauna Loa, Hawaii, US

Shield volcanoes have gently sloping sides, and are formed from thin, runny lava. Their eruptions are less explosive and much less dangerous than other volcanoes. These gentle eruptions can continue for years.



CINDER CONE

Paricutin, Mexico

Cinder cone volcanoes are the smallest and most common type of volcano. They are cone-shaped with steep sides. Their eruptions are usually not too violent.



CALDERA

Ngorongoro, Tanzania

Calderas are large, circular hollows, almost like a bowl. They form when a massive eruption forces most of the magma out of the chamber under the volcano, causing it to collapse.

Earthquakes

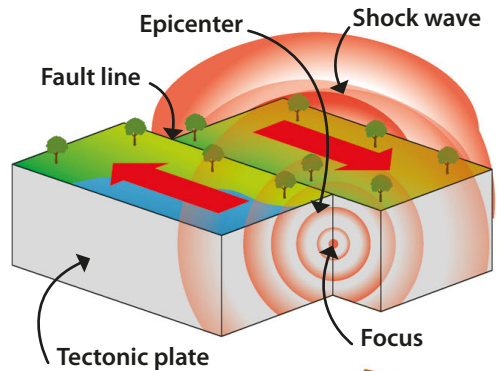
When the rocky tectonic plates that form Earth's crust move suddenly, large waves of energy spread out, causing the ground to shake. This is an earthquake. Some earthquakes are fairly gentle and may even go unnoticed, but others can bring terrible destruction.

Earthquake crack

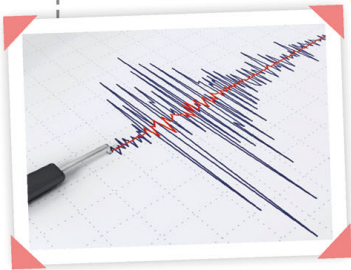
An earthquake can cause large cracks to open up in the Earth's surface. Many are small, no more than a few feet deep or wide, but others are massive, and whole buildings can fall into them.

What causes an earthquake?

The plates in Earth's crust constantly slide past each other, but can get stuck. Pressure then builds up until the plates finally move, sending out shock waves. The focus of an earthquake is the point inside the ground where pressure builds up. The epicenter is the point on the surface above the focus.



1-2



Seismograph

This machine is used to measure the force of the vibrations caused by an earthquake. It records how powerful these vibrations are on a numbered scale.

2.5-4



Mild tremors

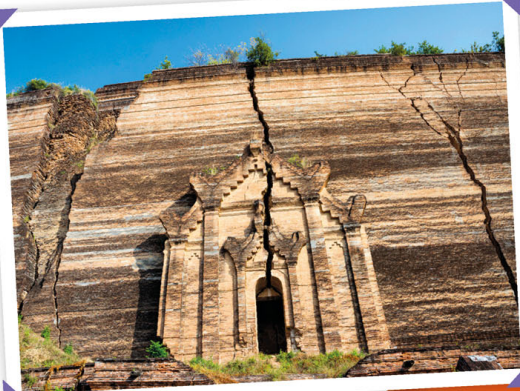
Earthquakes that a seismograph records as having a force of 2.5-4 are felt as mild tremors. They cause little or no damage, although trees may sway and windows rattle.

5-6



Italy 2009

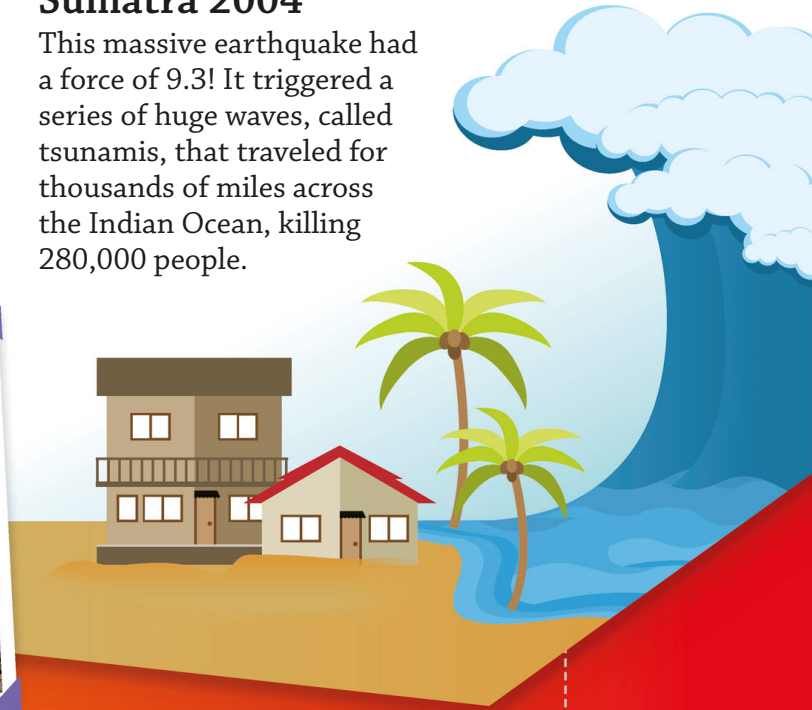
In 2009, an earthquake measuring 6.3 on a seismograph struck L'Aquila in central Italy. Many buildings collapsed and around 300 people died. Thousands of smaller earthquakes, called aftershocks, followed.



6.3

Sumatra 2004

This massive earthquake had a force of 9.3! It triggered a series of huge waves, called tsunamis, that traveled for thousands of miles across the Indian Ocean, killing 280,000 people.



7.9

9.3

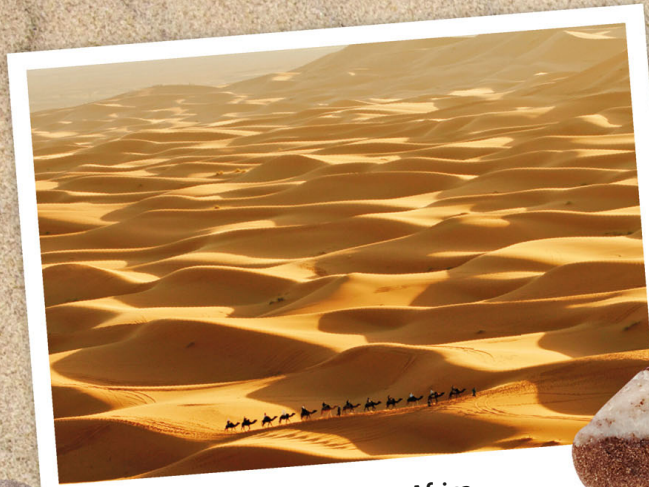
Wobbling dishes

When an earthquake has a force of 5–6, windows are likely to crack and dishes fall off shelves and smash. Some buildings may suffer serious damage.



China 2008

A force-8 earthquake struck Sichuan Province, China, in 2008. Huge chunks of rock fell down from the mountains, smashing towns and villages. Tremors were felt up to 1,060 miles (1,700 km) away.



Sahara Desert, Africa

Hot deserts

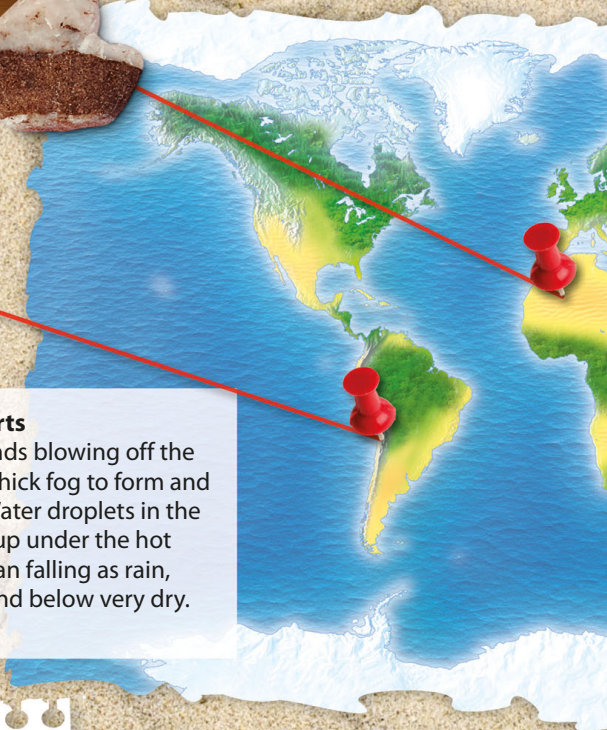
Temperatures often reach 122°F (50°C) or higher during the day in hot deserts. But at night, it can be very cold. Most hot deserts are near the equator, where there is strong sunlight all year round.



Atacama Desert, South America

Coastal deserts

Here, cold winds blowing off the ocean cause thick fog to form and drift inland. Water droplets in the fog soon dry up under the hot sun, rather than falling as rain, leaving the land below very dry.



Deserts

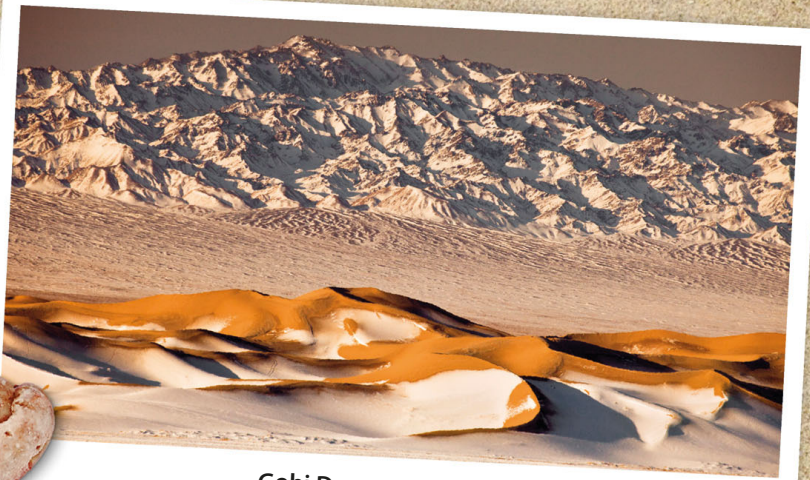
About a third of Earth's surface is covered by deserts. They are areas that get little or no rain, so they are extremely dry. Only a few species of animals and plants can survive in them. We usually think of deserts as very hot places, but some are very cold.

! WOW!

The largest desert, the Sahara, covers about a quarter of Africa!

Cold deserts

The largest cold deserts are in Central Asia, usually in high, flat areas. They are very dry, like all deserts, but are also very cold for most of the time. During the long winters, temperatures often drop as low as -40°F (-40°C).



Gobi Desert, Central Asia



Ross Island, Antarctica

Polar deserts

These are extremely dry and cold. Temperatures rarely rise above 50°F (10°C), even in summer. Some are covered in ice and snow all year, while others are covered in gravel and large rocks. Most of Antarctica is polar desert.

Desert landforms

Over thousands of years, many different natural features, or landforms, have developed in deserts. These include hills; mountains; narrow, steep-sided valleys called canyons; large, flat areas called plains; sand dunes; strange rock formations; and oases.



Sand dunes

These hills are formed by the wind blowing across the desert sand, so that it piles up.



Oases

Rare underground water can create pools of water. Plants then spring up around them.

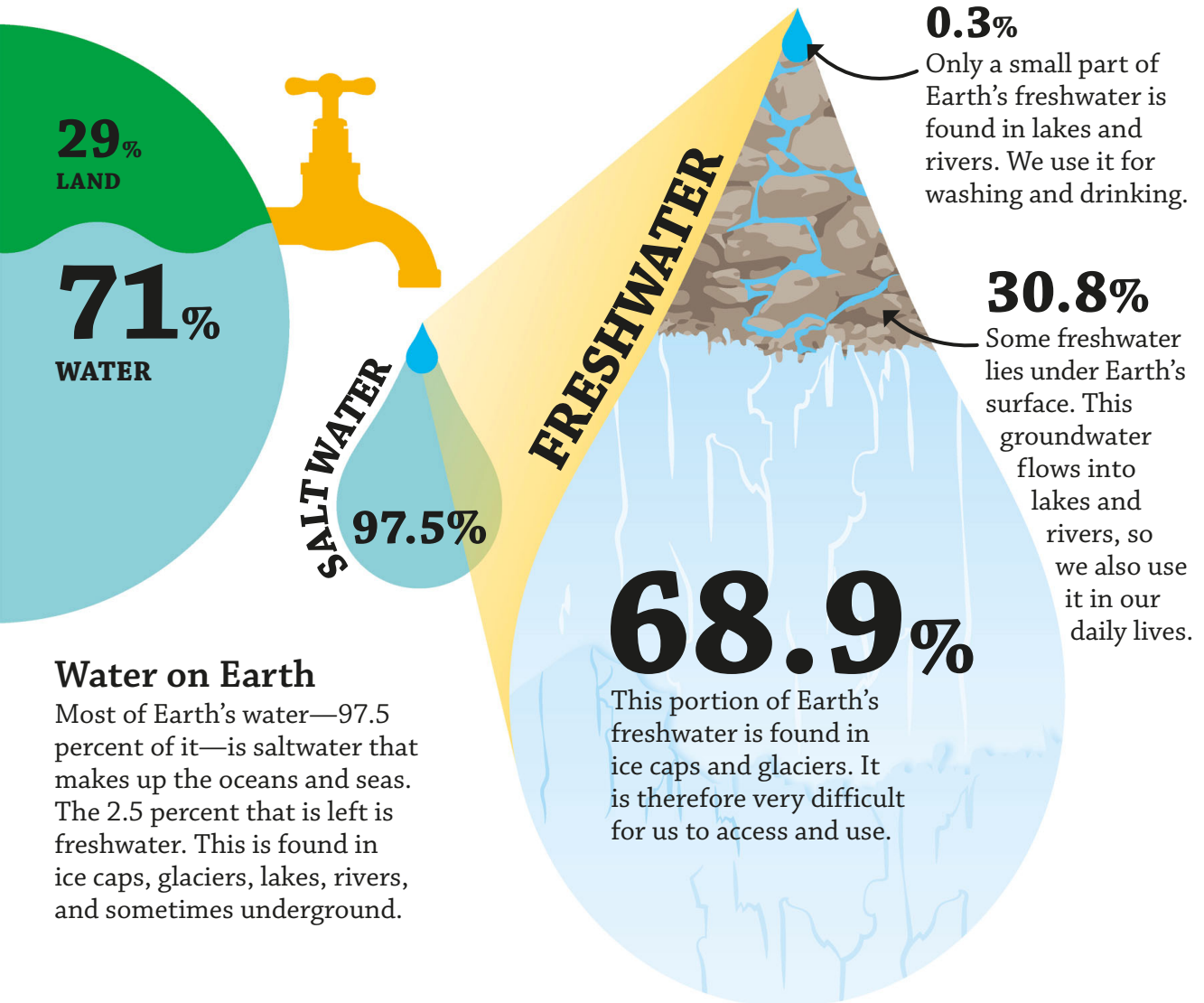


Mesas and buttes

Sand and grit, carried by the wind, wear away rock to create these steep, flat-topped hills.

Water

Water is essential to life on Earth. Without it, plants and animals would not be able to survive. Around 71 percent of Earth is covered in water. This includes both saltwater and freshwater. Not all of Earth's water is easily available for us to use.



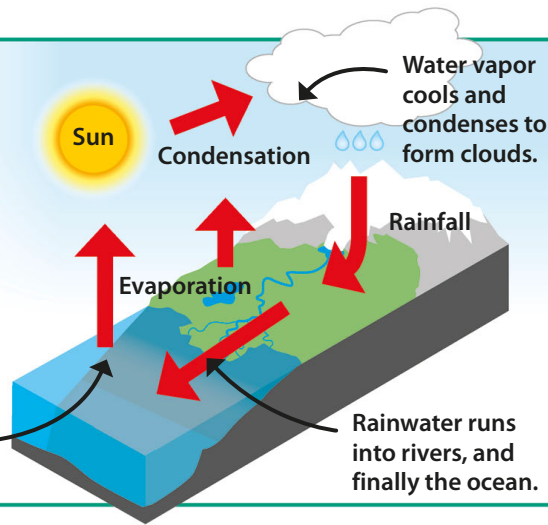
Water on Earth

Most of Earth's water—97.5 percent of it—is saltwater that makes up the oceans and seas. The 2.5 percent that is left is freshwater. This is found in ice caps, glaciers, lakes, rivers, and sometimes underground.

The water cycle

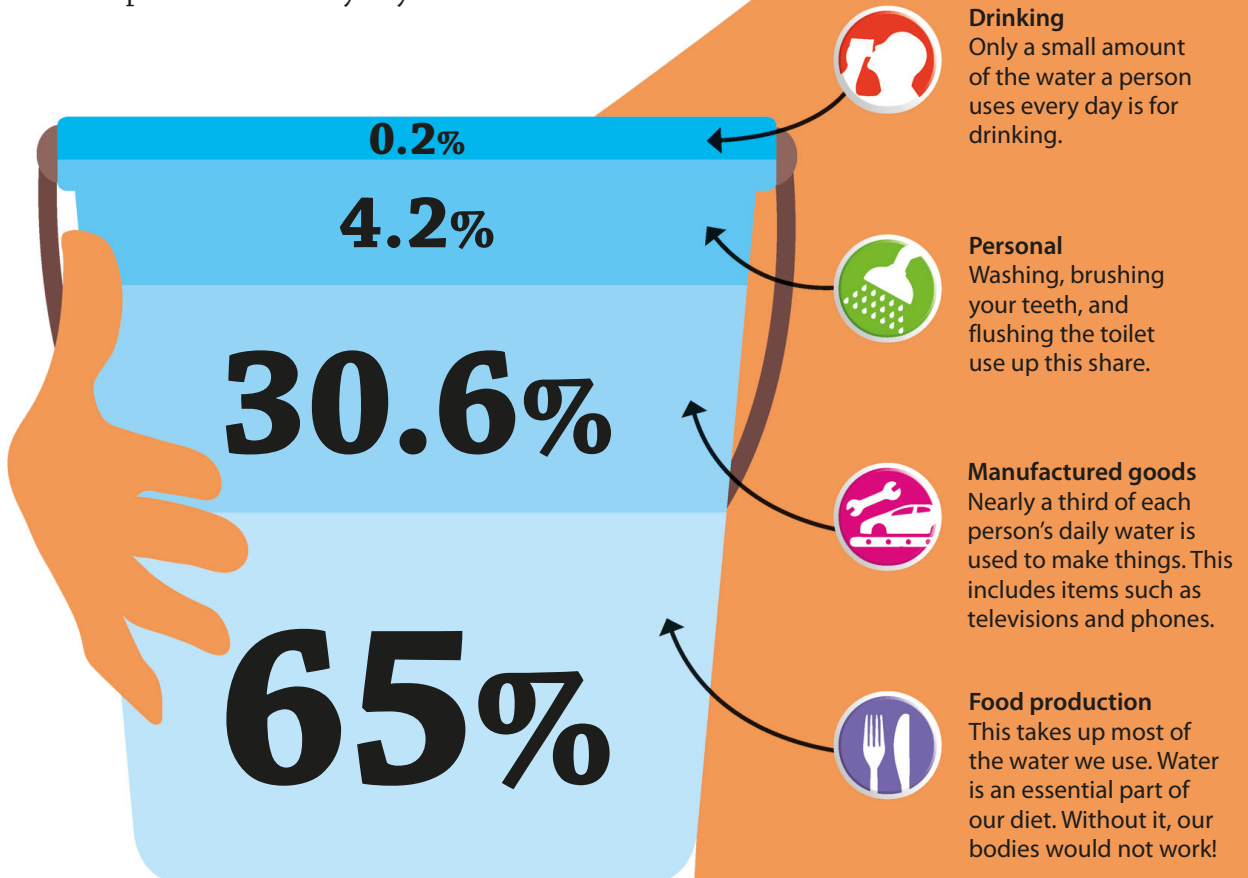
Earth's water is always moving from one place to another. This process, called the water cycle, is a continuous journey, in which water moves between the land, the atmosphere, and the ocean.

The sun's heat makes water evaporate, or turn to vapor, which rises up into the air.



How we use water

We use large quantities of water. We drink it, wash with it, use it in industry, and also prepare food with it. Below are the percentages of the water that each person uses every day for these activities.



Oceans

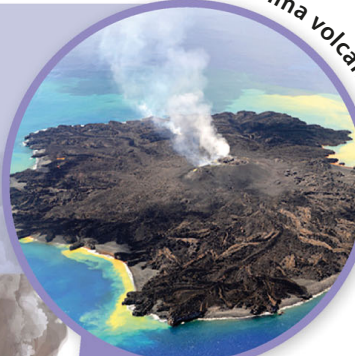
Around 71 percent of the Earth's surface is covered by oceans. Many different and interesting features are found in and around them, and a huge variety of animals and plants have adapted to life in this watery world.



Pacific green turtle

Volcanic islands

These islands are formed from layers of magma, or hot liquid rock, which erupts from a volcano under the water, then cools and hardens. The magma layers eventually build up to create an island.



Nishinoshima volcanic island, Japan

Open ocean

This is the top layer of the ocean, nearest the surface. The open ocean is vast. Although food can sometimes be hard to find, many animals, such as dolphins, seals, and turtles, live there.

Oceanic trench

When tectonic plates in the ocean floor move and collide, one may be pushed under the other, creating a narrow trench. These trenches are the deepest places in the Earth's oceans.

Seamounts

These underwater mountains are formed by volcanic eruptions on the ocean floor. Most of them are not erupting.

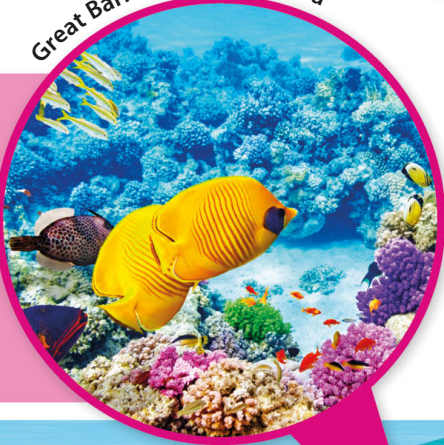
Tectonic plates in the ocean floor are moving.

Tectonic plates in the ocean floor are moving.



Mupe Bay, Jurassic Coast, Dorset, United Kingdom

Great Barrier Reef, Australia



Coral reefs

These are made from the skeletons left by tiny sea animals, called coral polyps, when they die. The skeletons build up into huge reefs, where plants and other sea creatures live.

Rock pools

When the tide goes out on a rocky seashore, pools of water are left behind in holes in the rocks. These then become home to a huge range of plants and animals, such as shellfish and sea anemones.

Oceanic ridge

Moving tectonic plates can also create underwater mountains. The Mid-Atlantic Ridge, under the Atlantic Ocean, is more than 40,000 miles (64,000 km) long.

Hydrothermal vents

When seawater filters down cracks in the Earth's crust, it is heated by volcanic activity. Hot water then spurts out through the cracks or vents.

! WOW!

Nearly **95%** of the world's oceans remain **unexplored!**

Rivers

A river is a natural channel of freshwater that flows across the Earth's surface. All rivers start in mountains or hills and flow down toward the sea or ocean, or into another large body of water. They may be short and narrow, or very wide and flow for hundreds of miles.

Source

This is where a river starts, high up in the mountains. The source, or place where the river starts from, could be a spring, or a lake, or even a melting glacier. A river can have more than one source.

Tributary

A stream or river that flows into a larger river, rather than directly to the sea, is called a tributary. Some large rivers have hundreds of tributaries!

V-shaped valley and gorge

Near its source, a river flows very fast. The rushing water wears away the surrounding rock. This widens and deepens the river channel, forming a gorge or V-shaped valley.

Waterfall

Rivers usually flow over a mixture of hard and soft rock. The force of the water will wear away more soft rock than harder rock. Where this happens, there may be a steep drop in the level of the riverbed, creating a waterfall.

Iguazu Falls, Argentina, South America



Fast-Flowing

MIDDLE COURSE

Meander

A meander is a curve or bend in a river. It forms when the flow of water wears away the land on one side of the river, then dumps the broken-down rocks this creates on the other side, increasing the area of land there.

Fertile floodplains

These are flat areas of land next to a river. Water in a river may increase for some reason and become too much for the river to carry. It then overflows onto the floodplain. Soil in floodplains is usually very fertile.

Katmai Peninsula, Alaska, US, North America

Estuary or delta

Near the sea, saltwater mixes with freshwater, forming an estuary. The land is flatter, so the river slows down. If it slows down enough, mud is deposited, creating a delta with several channels that the river now flows through.

Mouth

The river's journey ends here. It is where it finally flows into the sea, ocean, or other large body of water, such as a lake.

SLOW-FLOWING

Li River, China, Asia

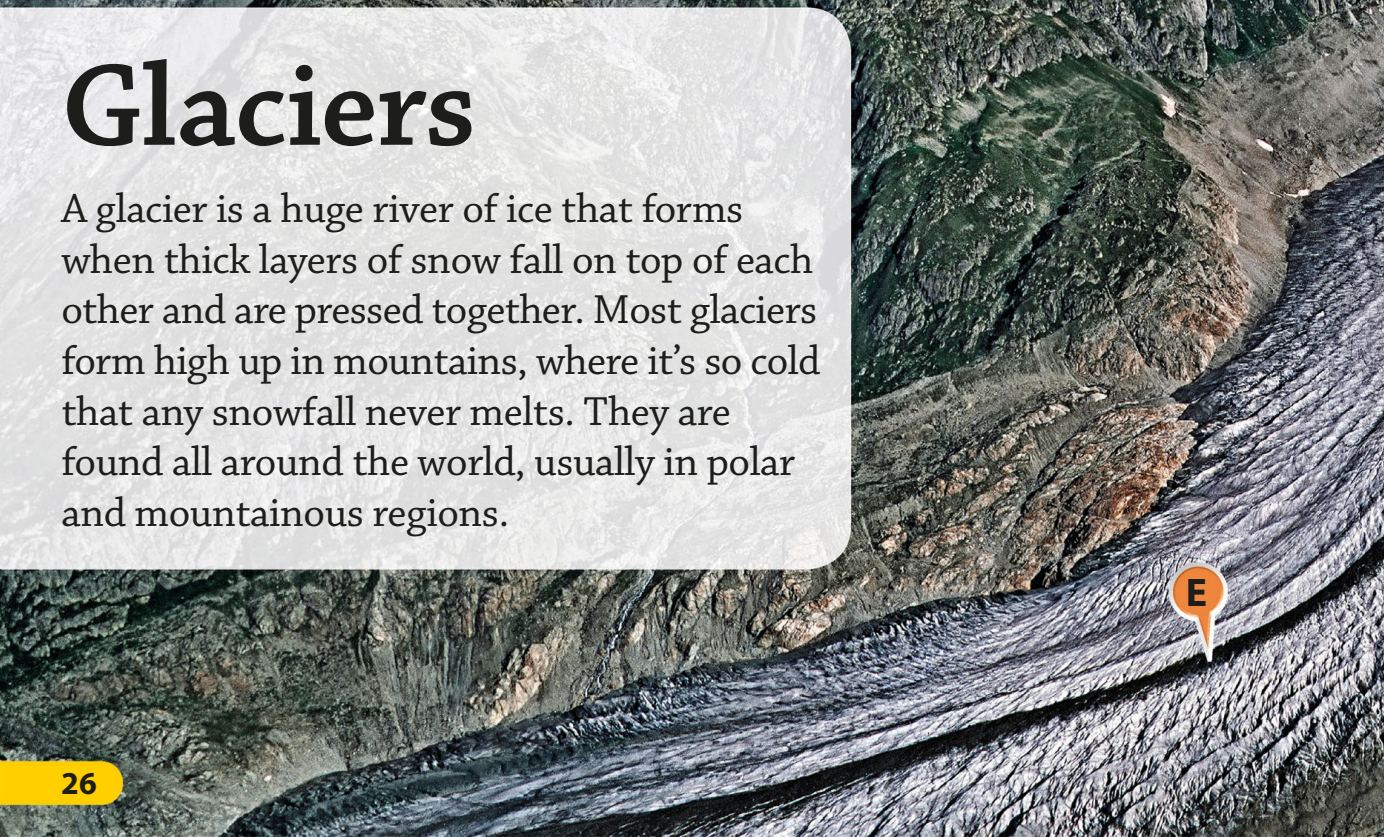
LOWER COURSE





Glaciers

A glacier is a huge river of ice that forms when thick layers of snow fall on top of each other and are pressed together. Most glaciers form high up in mountains, where it's so cold that any snowfall never melts. They are found all around the world, usually in polar and mountainous regions.



PARTS OF A GLACIER

- A** **Cirques** are deep hollows near the top of a glacier, formed where a glacier has moved over an area and worn away the rock.
- B** **Accumulation zones** are found at the top of glaciers, where the snowfall has built up, often over hundreds of years.
- C** **Valley glaciers** flow through steep-walled valleys. They eventually wear down the valley sides, making them much rounder.
- D** **Lateral moraines** are long ridges of rock, soil, and dirt left along the sides of a moving glacier.
- E** **Medial moraines** are piles of rock, soil, and dirt that are left behind where two glaciers meet.

Glacier terminus

The glacier terminus is the lower end of a glacier. It is sometimes called the toe or snout. Some glaciers end farther down a mountain, where the ice melts to form lakes and streams. Others reach the coast, where large chunks break off into the sea, creating icebergs. This is called calving.



Perito Moreno Glacier, Argentina

Erosion

Erosion is the wearing away of rocks and other matter on the Earth's surface by a natural force, such as a sliding glacier, a flowing river, or the wind. Material that is rubbed off is carried away and deposited somewhere else.



Water erosion

This is caused by falling rain or flowing water. Rivers, for example, wear away the land that they flow over, changing the surrounding landscape.



Wind erosion

The force of the wind can remove pieces of rock and carry them off. Wind erosion is common in deserts.



Ice erosion

As glaciers move, they rub away the land under them, carrying the broken-down material with them.



Coastal erosion

Crashing waves gradually wear away the rock in cliffs, and sweep up material from the beach.

Biological weathering

This is when plants or animals cause rocks to break up. Plant roots often grow into small cracks in rocks, splitting them apart. An animal digging can also turn rocks into rubble.

Weathering

Weathering occurs when rocks are weakened, so that they crack and then break up into smaller pieces. This natural process can be caused by rainfall, changes in temperature, or even by plants as they grow. There are three types of weathering—biological, chemical, and physical.



Chemical weathering

Chemical reactions can break up rock. Acid rain, for example, destroys the stone in statues and buildings.



Physical weathering

Wind, water, and temperature changes weaken rock. If water in a crack freezes, it expands and can tear a rock apart.

! WOW!

Water erosion created the Grand Canyon in North America!

Caves

Caves are underground spaces or holes. Some are large enough for a person or animal to enter. They form in many different ways, all of which involve rock in the Earth's surface crumbling and wearing away. Caves often have lots of interesting and exciting features to explore.

Stalagmite

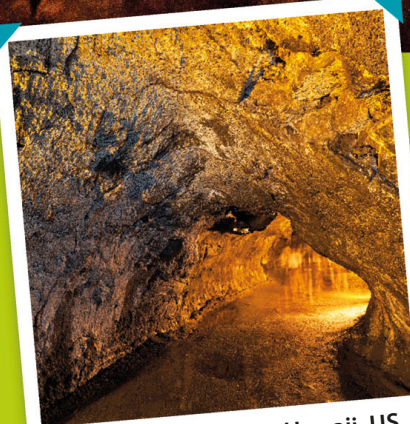
Water dripping onto the cave floor leaves behind tiny rocky particles that were dissolved in it. As the dripping continues, these particles can build up to form a pillar of rock, or stalagmite.

Solutional caves

These are the most common type of caves. They are created when a build up of acidic water dissolves the rock around it. Holes and tunnels start to appear, getting bigger and bigger as more rock dissolves and is washed away.

Types of caves

Caves are found all over our planet. Some are small, single spaces, but others contain many chambers, linked by tunnels to form a huge maze of different areas. Although most caves are found in rock, some form in ice or lava.



Thurston Lava Tube, Hawaii, US

Lava caves

When lava flows slowly over land around a volcano, it can harden on the surface, leaving liquid lava flowing underneath. This liquid drains away, leaving a hollow tube of rock that forms a cave.

Stalactite

These hang down like icicles. They form in the same way as stalagmites, from rocky particles dissolved in water, this time dripping from the cave's ceiling.

Soda straws

These thin, hollow tubes also form from dissolved particles in water, dripping slowly through the roof of a cave. They may grow into stalactites, if the water keeps dripping for a very long time.

Column

If a stalagmite and stalactite become long enough and meet, they will form a rocky column. Columns are also created when a stalactite grows down to touch the cave floor.



Skaftafell ice cave, Iceland



Benagil cave, Portugal

Ice caves

Ice melting on top of a glacier can form a stream or waterfall that flows through the glacier. Eventually, this flowing water will hollow out part of the glacier, creating an ice cave.

Sea caves

These are formed by waves constantly battering against cliffs along the seashore. This leads to cracks appearing in the cliffs that get larger as beating waves continue to wear away the rock.

Record breakers

Our planet is full of incredible natural wonders, some of which are millions of years old. From skyscraping mountains to underground caves, here are five of Earth's record-breaking land features.

HIGHEST



Mount Everest, Nepal

The peak of Mount Everest lies 29,029 ft (8,848 m) above sea level, making it the world's highest mountain. It is ten times taller than the world's tallest building—the Burj Khalifa skyscraper in Dubai.

LONGEST



Nile River, Africa

The world's longest river is the Nile, at 4,238 miles (6,825 km) in length. It flows through 11 African countries, from Burundi to Egypt, where it meets the Mediterranean Sea. The Nile takes its name from the Greek for “river valley.”

Krubera Cave, Georgia

The world's deepest cave lies in Asia. Stretching down 7,208 ft (2,197 m), it is nearly as deep as seven of Paris's Eiffel Towers. Russians call the cave *Voronya*, meaning "crows' cave," after the many crows nesting at the entrance.

DEEPEST



DRIEST



Atacama Desert, Chile

Covering 600 miles (1,000 km), this South American desert is one of the driest places on Earth. Some parts have not seen rainfall since records began at least 400 years ago!

TALLEST

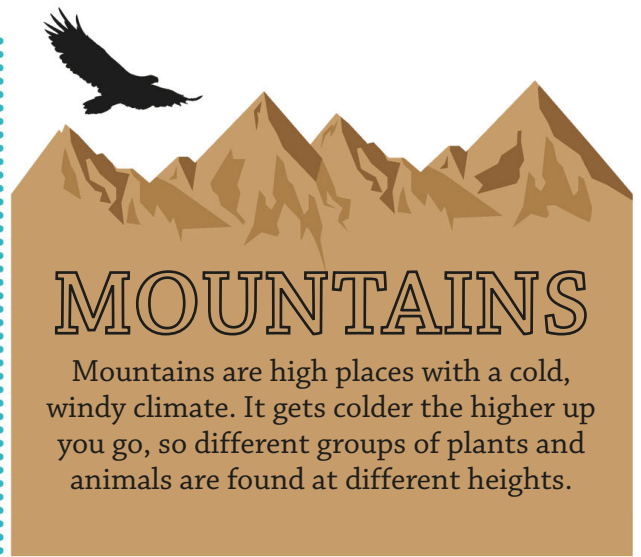


Angel Falls, Venezuela

Spectacular Angel Falls is the world's tallest waterfall. With a drop of 3,212 ft (979 m), it is more than twice the height of New York's Empire State Building. American pilot Jimmy Angel first spotted the waterfall from the air in 1933.

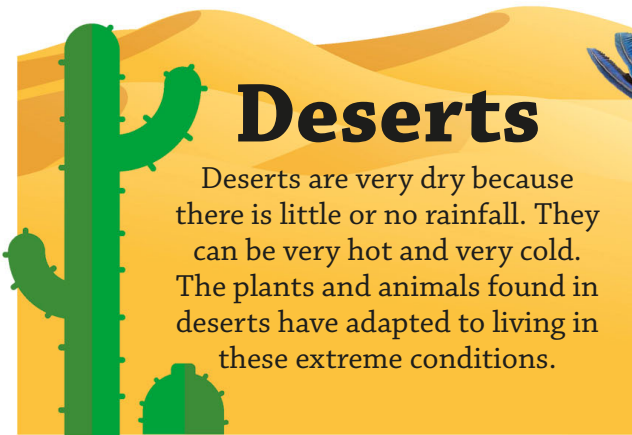
Biomes

Earth can be divided up into a number of different types of landscapes. These zones are called biomes. Every biome is home to a particular group of plants and animals that are suited to the conditions found there.



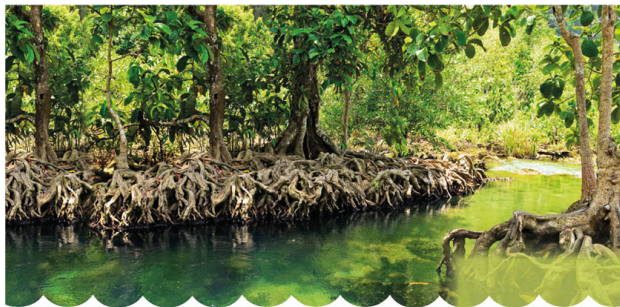
MOUNTAINS

Mountains are high places with a cold, windy climate. It gets colder the higher up you go, so different groups of plants and animals are found at different heights.



Deserts

Deserts are very dry because there is little or no rainfall. They can be very hot and very cold. The plants and animals found in deserts have adapted to living in these extreme conditions.



Wetlands

Wetlands are permanently flooded with water. This can be saltwater, freshwater, or a mixture of both. Swamps, bogs, marshes, and deltas are all types of wetlands. Many birds thrive in this environment.



Rain forests

Rain forests get a lot of rain. Most of them also get a lot of sunlight, and are very hot all year round. They are home to many different plants and animals. The largest rain forest is the tropical Amazon rain forest in South America.



Deciduous forests

The temperature and rainfall in deciduous forests changes from season to season. During the fall and winter, most trees change color and lose their leaves.

Coniferous forests

These forests have long, cold, snowy winters and short, warm summers. Trees here have adapted to this harsh climate. They are mostly evergreen, meaning they stay green all year round.



GRASSLANDS

Grasslands get little rainfall. Only grass and a few small trees and bushes can grow in these dry places. But many animals, such as zebras and elephants, manage to live there.



TUNDRA

It is usually very cold and windy in the tundra, and there is not much rain. The ground is often covered in snow, so only a few plants and animals can live there.



Polar ice

This is the coldest biome on Earth. The freezing temperatures make it difficult for any plants to survive. Animals, such as polar bears, penguins, and seals, have adapted well to life here.



Conservation

We need to preserve and take good care of the Earth and its resources—the air, water, soil, plants, and animals on which we depend. This is what conservation is all about.

START

Learn to conserve!

Play this game to find out more about what can harm and what can help conserve our planet. Grab a dice and some counters, and get started!

How is our planet affected?

When people fail to conserve resources, Earth is affected in a number of ways:



Energy

Fossil fuels, such as oil and coal, are used up too quickly, and cannot be replaced.



Pollution

Waste gases in the atmosphere trap heat from the sun, so the Earth gets hotter.



Water

Higher temperatures, along with low rainfall, will eventually lead to drought.



Food

Drought and soil pollution can damage crops, so there is not enough food.



Forests

Cutting down trees can lead to plants and animals losing their homes.



Waste

Waste pollutes the environment. Also, if we waste resources, they will run out!

1 Faucet left running. Miss a turn!

Water is valuable. It is essential for life, so never waste it.



2

3 Saving paper. Move forward 3 places!

If you reuse scrap paper, and buy goods made from recycled paper, fewer trees will have to be cut down to make more paper.

4 Driving to a friend's house. Miss a turn!

Harmful gases from cars pollute the air. Walk or bicycle instead.



7

6 Not recycling. Miss a turn!

You are sending too much waste to landfill sites. This can damage the soil, water sources, and the atmosphere.

5

8 Wind farm. Move forward 2 places!

A wind farm creates electricity. Wind is a renewable source of energy, so using it does not harm the environment.

9



10 Factory waste
polluting river.

Miss a turn!

This harms plants
and animals living
in or near the river.

11



12



13 Bird sanctuary.
Move forward

1 more place!

A sanctuary gives birds
and other wildlife
a safe home.

16



15 Destroying forest.
Miss a turn!

Animals and plants
that depend on the
forest may die.

17

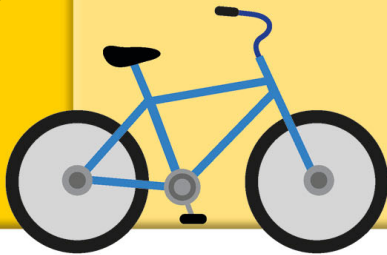
14

18 Bicycling to school.
Move forward

2 more places!

Bicycles, unlike
cars, don't pollute
the air.

19



20

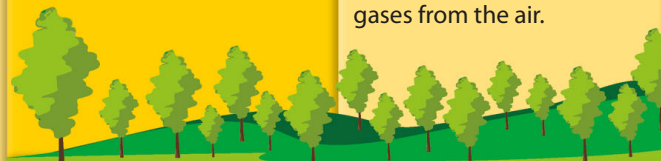
21 Dropping
litter.

Miss a turn!

Litter can harm the
soil, plants, animals,
and humans.



24



23 Planting trees.
Move forward

1 extra place!

Trees remove waste
gases from the air.

22

25 Leaving lights
on. Miss a turn!

Electricity is often
made from resources
that can't be renewed.

26 Growing fruit and
vegetables. Move
forward to finish!

Growing your own
food saves on the
cost of getting it
to the stores.

27



You're a conservation expert!

Congratulations! You now know
much more about how you can help
make Earth a healthy and happy place.
Spread the word—tell your family and
friends, so that they can help too.

FINISH





Sunshine

Heat from the sun warms the air, creating dry, bright weather conditions.



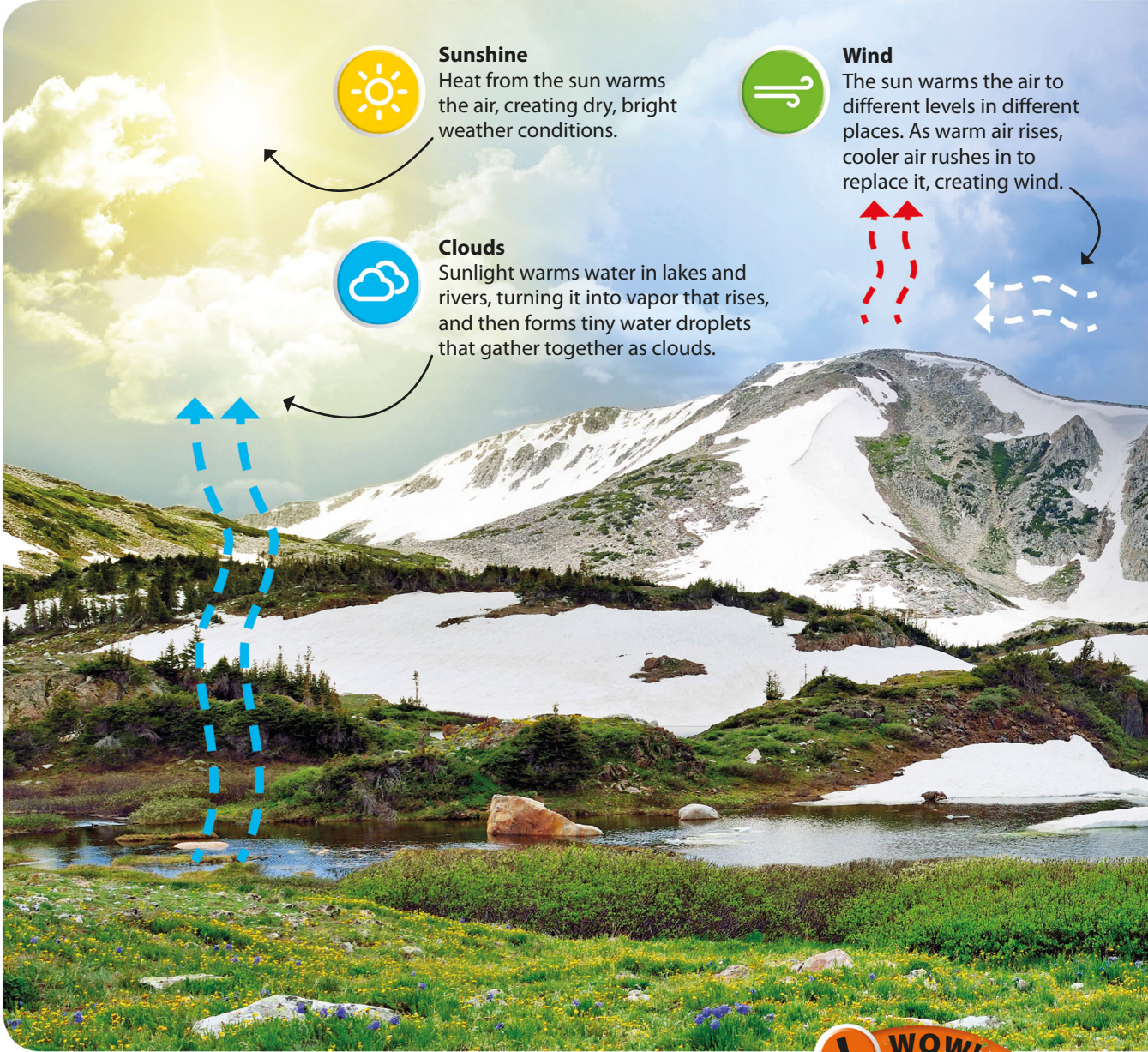
Wind

The sun warms the air to different levels in different places. As warm air rises, cooler air rushes in to replace it, creating wind.



Clouds

Sunlight warms water in lakes and rivers, turning it into vapor that rises, and then forms tiny water droplets that gather together as clouds.



Weather

Sunshine, clouds, wind, rain, frost, and snow are some of the different weather conditions that we experience on Earth. The sun plays a major role in the way one set of weather conditions changes to another set.



WOW!

Large raindrops can fall to Earth at speeds of up to **20 mph** (**32 km/h**)!



Rain

Water droplets in clouds get bigger and become too heavy to remain in the sky. They then fall as rain.



Snow

When it gets very cold, water droplets in clouds form ice crystals that group together and fall as snowflakes.



Extreme weather

We say that we have extreme weather when conditions are very different from those that we are used to. Extreme weather can suddenly appear without warning, and may last for hours or even days, bringing death and destruction to an area. Flooding, heatwaves, blizzards, hurricanes, and tornadoes are all types of extreme weather.



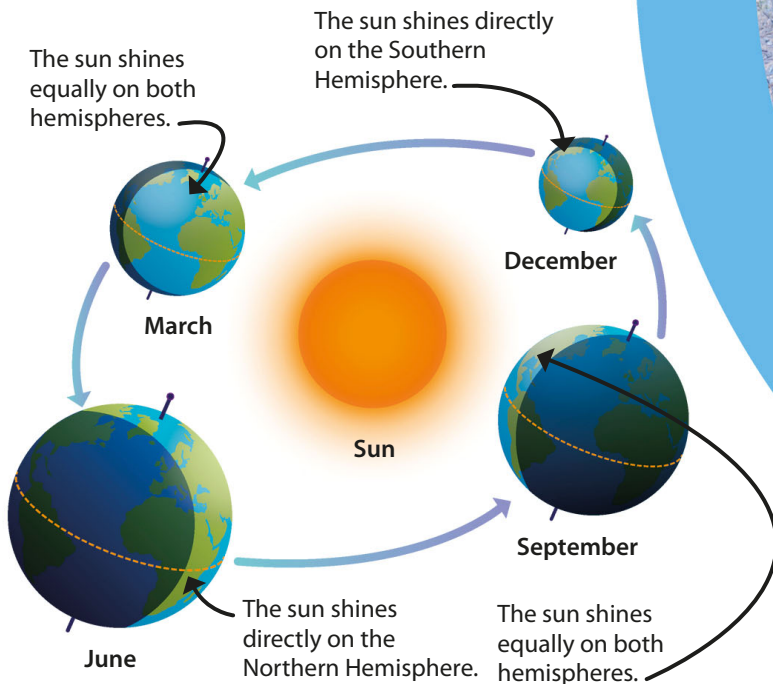
Hurricane Felix, Honduras

Seasons and climate

Earth takes a year to travel, or orbit, around the sun. At the same time, it spins on its axis, an imaginary line between the Poles. This means the amount of sunlight falling on any area of Earth varies during the year, changing the weather and creating seasons—spring, summer, fall, and winter.

How seasons change

Earth is tilted on its axis as it spins and orbits around the sun. This tilt causes one half, or hemisphere, of Earth to lean toward the sun, while the other half leans away. For the half leaning toward the sun, it is summer. For the other half, it will then be winter.



SPRING

Spring is a time of change between summer and winter. Days gradually get brighter, warmer, and wetter. Leaves start to grow on the trees and baby animals are born.

WINTER

Winter is the coldest season. Days get shorter and nights get longer. Some animals grow thick coats to keep them warm in winter. Others just fall asleep, or hibernate.

Summer is the hottest season. The days get longer and the nights become shorter. Plants grow well in the warm sunlight. There are lots of green leaves on the trees.

SUMMER



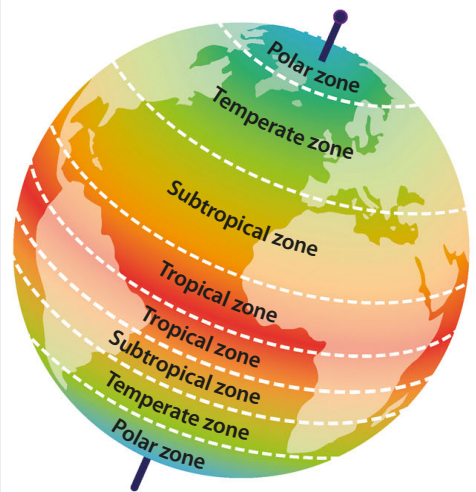
Fall is when summer gradually changes into winter. Temperatures start to cool. The leaves on the trees change color to orange and brown, then fall to the ground.

FALL



Climate

The climate of an area is the type of weather it usually experiences. It includes the amount of rainfall, hours of sunshine, and highest, lowest, and average temperatures. Earth is divided into climate zones that are based on their distance from the equator.



Tropical zone This area is very hot and damp all year round. It rains a lot and thunderstorms are common.



Subtropical zone Here, summers are long, dry, and hot. Winters are wet, but usually short and mild.



Temperate zone Extreme conditions are rare here. Summers are warm and winters cold, but not freezing.



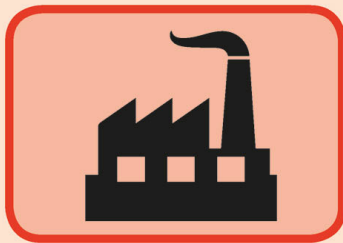
Polar zone It is icy and dry all year round here. Winters are long and dark, while in summer the sun shines most of the time.

Climate change

Earth's climate has always changed naturally over time. However, climate change now appears to be speeding up! Many recent changes in climate are caused by our modern way of life. Earth is getting warmer, which can have a huge effect on the environment.

Causes

Humans are thought to be responsible for the most recent, major climate changes. Waste gases have built up in Earth's atmosphere due to industry, transportation, and deforestation. These trap more heat around the Earth, so temperatures rise.



Industry

Whenever we burn oil, coal, or natural gas, waste gases are released into the atmosphere.



Transportation

We now use cars, buses, and planes regularly. They all fill the air with lots of waste gases.

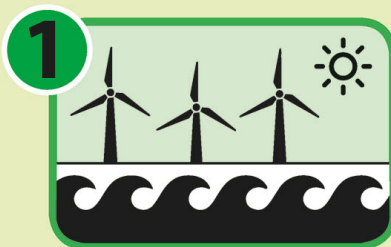


Deforestation

Trees help remove gases from the air. So, as more trees are cut down, more waste gases stay in the air.

How can we help?

There are many ways you can help slow down climate change. Just by turning off your computer or the TV when you're not using them, or the lights when you leave a room, or by walking to school, you reduce the level of waste gases in the atmosphere.



Renewable energy

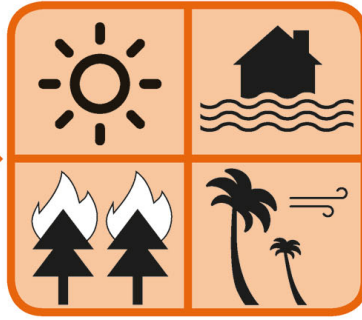
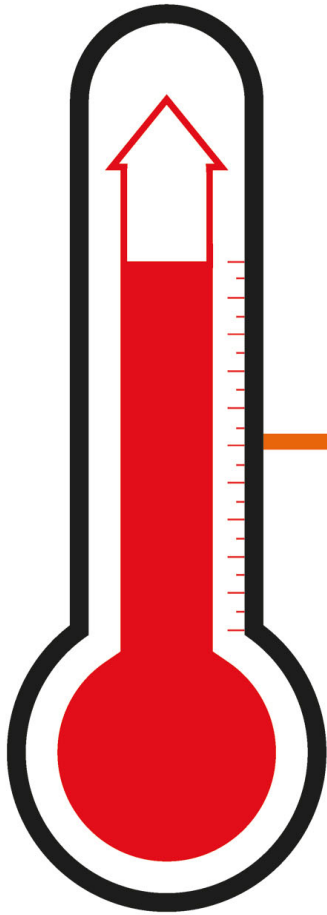
Use more energy from resources that there are plenty of, such as sunshine, wind, and waves.



Transportation

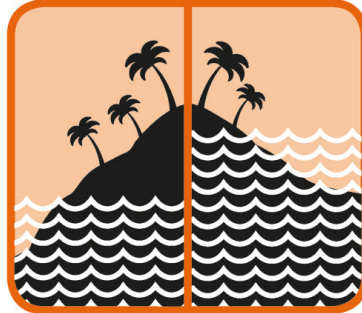
Avoid transportation that releases waste gases into the air. When you can, bike or walk instead.

Effects



Extreme weather

Heatwaves, droughts, heavy rain, and flooding are becoming more and more common, because of Earth's atmosphere warming up.



Rise in sea levels

Higher temperatures melt glaciers and ice caps. The water formed eventually flows into the ocean. Sea levels rise and areas near the coast are flooded.



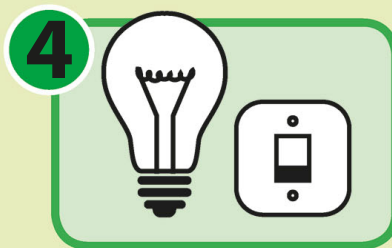
Changing natural habitats

Many animals live in special places, such as on sea ice or in coral reefs. Warmer temperatures can destroy both of these, so animals lose their home.



Recycle

Recycle plastic, glass, and paper. This reduces the amount of waste sent to landfill sites.



Save electricity

Stop leaving your computer or the TV on standby, and turn off the lights when you leave a room.



Grow your own food

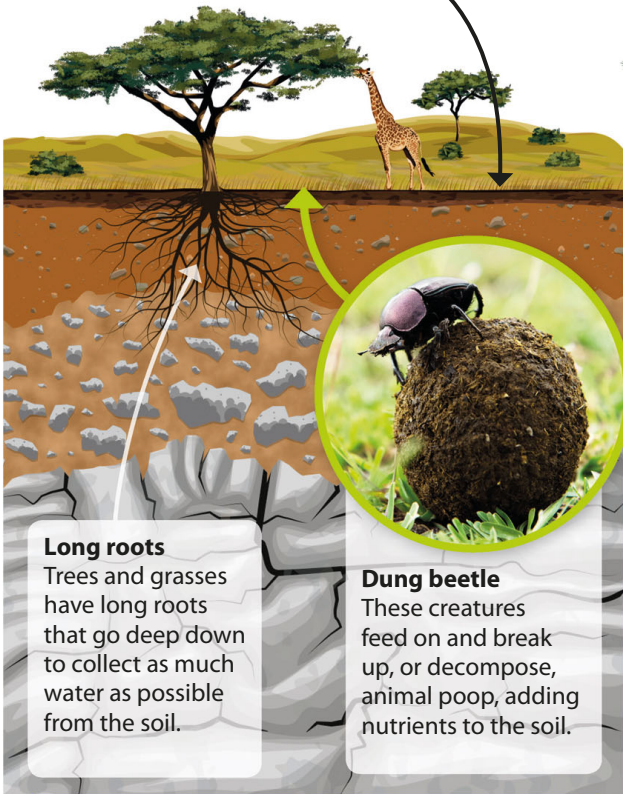
Food grown at or nearer home saves on the fuel needed to transport it to local stores.

Soil

Soil is the layer of loose material between the surface and the solid rock below the ground. Nothing can grow on Earth without it, but the soil varies in different places.

Grasses

The soil is rich in nutrients, so many grasses can grow healthily and quickly.



Long roots

Trees and grasses have long roots that go deep down to collect as much water as possible from the soil.

Dung beetle

These creatures feed on and break up, or decompose, animal poop, adding nutrients to the soil.

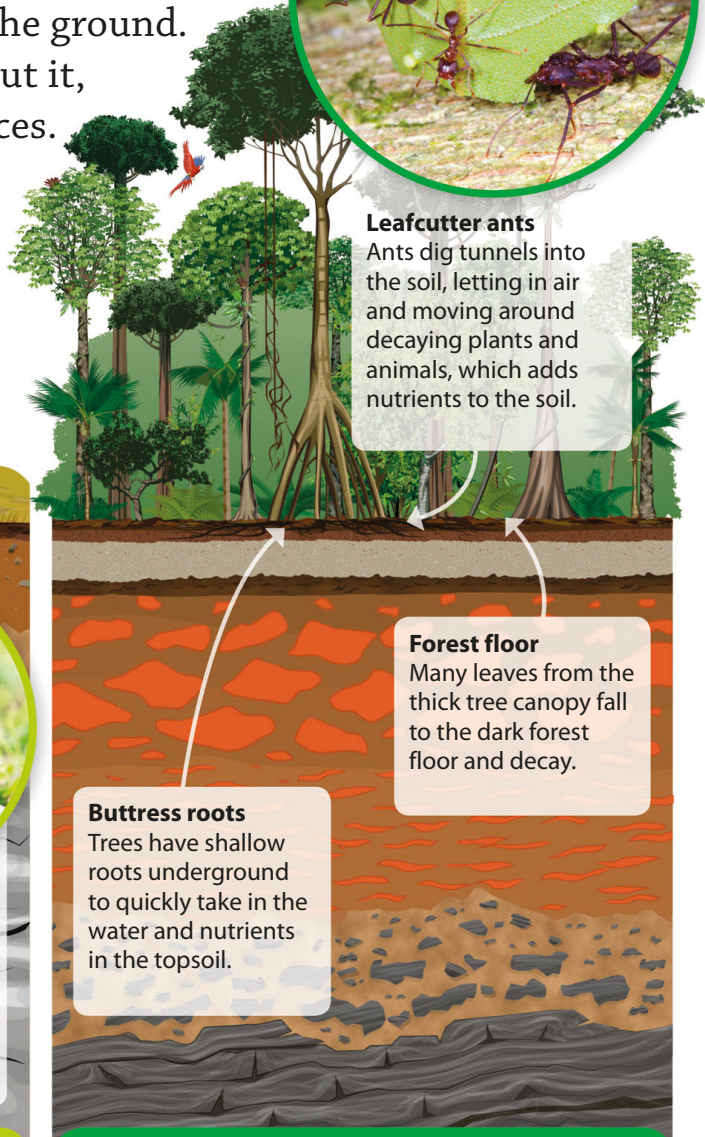
Grassland

The soil is usually deep and full of nutrients. This is because rotting grass roots help hold the soil together and add nutrients for new plants. Plants compete for water.



Leafcutter ants

Ants dig tunnels into the soil, letting in air and moving around decaying plants and animals, which adds nutrients to the soil.



Forest floor

Many leaves from the thick tree canopy fall to the dark forest floor and decay.

Buttress roots

Trees have shallow roots underground to quickly take in the water and nutrients in the topsoil.

Tropical rain forest

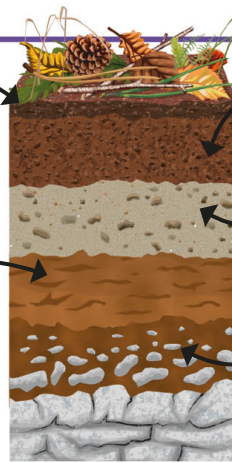
The soil is very wet and many plants grow, so there is lots of humus to add nutrients to the soil. However, these nutrients are washed away by the constant rain, leaving shallow, acidic soil.

Soil profiles

Soil is made up of broken rocks, minerals, decaying plants and animals, tiny creatures, gases, and water. If a section is cut through soil, you will see many layers. The depth of the layers vary in different soils.

Humus
Dead plants and animals decay, adding nutrients, or goodness, to the soil.

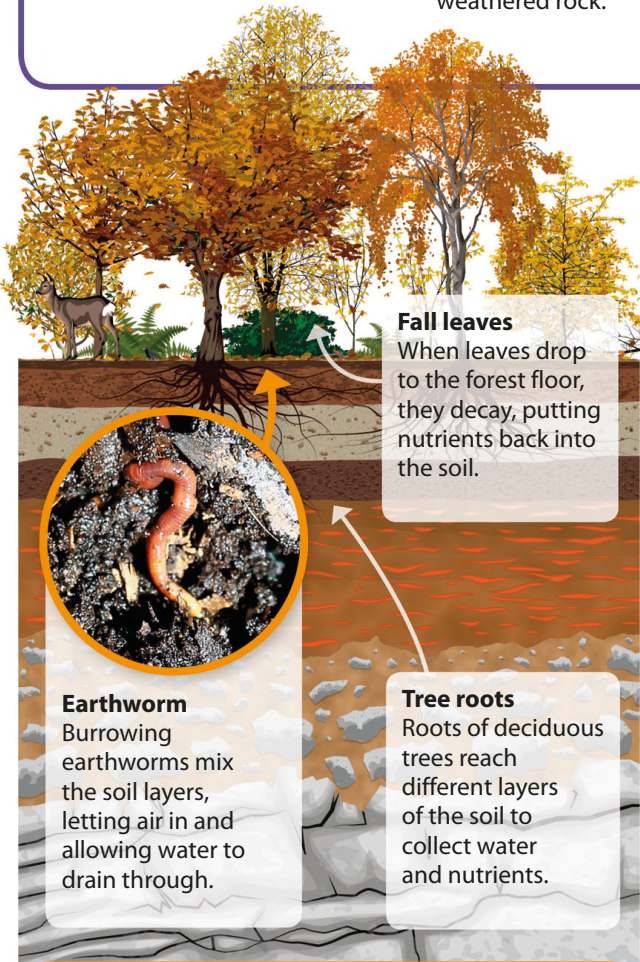
Subsoil
This moist layer contains clay and minerals from the weathered rock.



Top soil This dark layer is full of tiny creatures and nutrients, which plants use to grow.

Leaching layer
Water drips through this layer, leaving mostly sand and silt.

Weathered rock
Large rocks are broken up from the solid bedrock below.



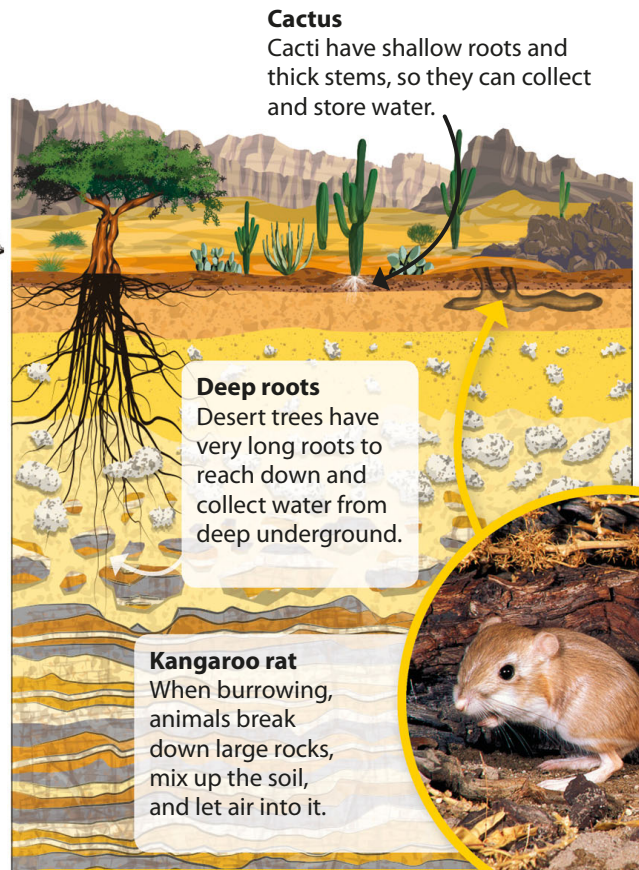
Fall leaves
When leaves drop to the forest floor, they decay, putting nutrients back into the soil.

Earthworm
Burrowing earthworms mix the soil layers, letting air in and allowing water to drain through.

Tree roots
Roots of deciduous trees reach different layers of the soil to collect water and nutrients.

Temperate deciduous forest

The soil is moist and full of nutrients from decaying plants and animals, especially in fall. The deep roots of plants break up the bedrock, which adds minerals. Water often drains through steadily.



Cactus
Cacti have shallow roots and thick stems, so they can collect and store water.

Deep roots
Desert trees have very long roots to reach down and collect water from deep underground.

Kangaroo rat
When burrowing, animals break down large rocks, mix up the soil, and let air into it.

Desert

The soil is very dry and few plants grow, so there is little humus. It is made up of boulders, pebbles, and sand, and is blown around by the wind. Any water drains through the sand easily.

Rock cycle

Rocks go through many changes over time. These are caused by different processes, such as heating, cooling, and weathering. The sequence of changes is called the rock cycle.

Cooling

When melted rock cools and hardens, it forms igneous rock. This can happen after a volcanic eruption or underground.

Igneous rock

Uplift

Metamorphic rock is forced upward slowly by pressure and the movement of Earth's crust to form mountains.

Heat and pressure

Some sedimentary rock is dragged down into the Earth's mantle, where pressure and heat changes the rock into metamorphic rock.

Metamorphic rock

Melting

In the heat, some rocks melt into liquid, called magma. Pressure can force magma out of the ground.

Types of rocks

There are three different groups of rocks: igneous, sedimentary, and metamorphic. Types of rocks are classified into these three different groups, depending on how they were formed.



Igneous rock

Types of igneous rock include basalt (shown here) and granite. These are formed by volcanic eruptions.



Sedimentary rock

Types of sedimentary rock include sandstone (shown here), chalk, and limestone. These form in layers of tiny rock pieces.



Metamorphic rock

Types of metamorphic rock include marble (shown here), slate, and shale. These are formed by heat and pressure.

Rocks on the move

Movements in the Earth's crust are causing rocks to slowly change. Volcanoes erupt and mountains are pushed upward, and the rocks that come to the surface are broken down by weathering. This rock is moved and dragged down into the Earth's crust again.

Weathering and erosion

Rocks on the surface are broken down into smaller pieces by weathering. Erosion breaks down the rocks further.

Transportation and deposition

Pieces of broken rock, called sediment, are moved along by wind or water, and eventually end up in lakes and oceans.

Sedimentation and cementation

In lakes and oceans, layers of broken rock, dead plants, and animal remains build up and stick together. This makes sedimentary rock.



**Sedimentary
rock**

Match up the rocks and minerals with their uses!

Rock uses

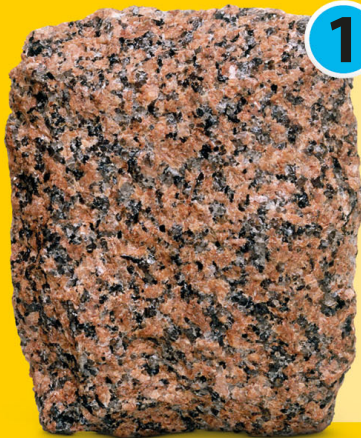
Rocks and minerals make up much of our planet. They are formed deep inside the Earth over millions of years. Rocks exist in lots of different shapes, textures, and colors. They are mined to provide many of the things around us. Can you guess which rock is used where?



A Steel nuts and bolts



B Beaded necklace



1 **Granite**
Granite is formed deep inside Earth's crust, when magma cools down slowly. It is a tough rock, used in buildings and other large structures.



2

Iron ore

Ores are rocks in Earth's crust that contain metal. Iron is strong and hard, yet easy to work. It is often turned into steel.



C Table salt



D Tower Bridge, UK



E Taj Mahal, India



3 Turquoise

This semiprecious stone is a mix of the metals copper and aluminum. Blue in color, turquoise has been made into jewelry and sculptures for thousands of years.



5

Marble

Marble is made from the rock limestone. Strong heat and pressure can crystallize limestone and turn it into marble. It is easy to carve and polish, producing a smooth finish. But marble is expensive, so it is only used for special sculptures and buildings.

Rock salt

Rock salt, also called halite, forms when seawater evaporates. It leaves behind salt crystals, which people can use to flavor food.

4



FACT FILE

- » **Land area:**
9.54 million sq miles
(24.71 million sq km)
- » **Countries:** 23
- » **Population:**
579 million
- » **Largest city:**
Mexico City



New York, New York

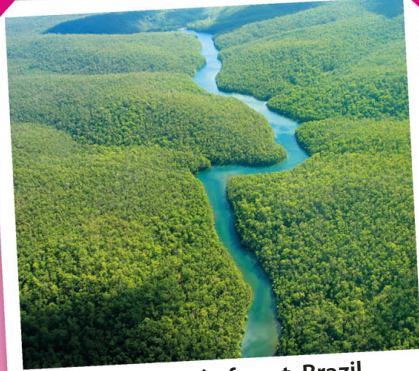
North America

This is the third largest continent, and has the fourth largest population. North America runs from the Arctic down to the tropics, so the climate varies a lot.



South America

Many different types of weather and landscape are found in South America. Because of this, a huge variety of plants and animals live there. It is also home to the biggest rain forest in the world—the Amazon.



Amazon rain forest, Brazil

FACT FILE

- » **Land area:**
6.88 million sq miles
(17.84 million sq km)
- » **Countries:** 12
- » **Population:**
422.5 million
- » **Largest city:**
São Paulo



Continents

All of the land on Earth is divided up into seven large areas, called continents. These are North America, South America, Europe, Africa, Asia, Australia, and Antarctica. Each continent is divided up into a number of different countries.

Antarctica

This is the coldest, driest, and windiest continent on Earth. It is almost entirely covered in ice for most of the year. Only a few species of animals and plants can live there.



South Georgia,
Antarctica



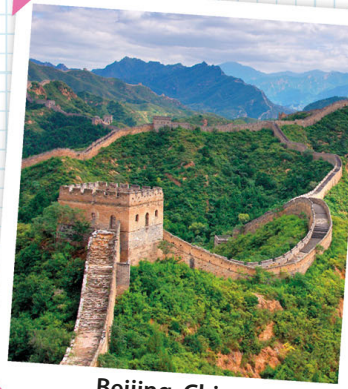
Rome, Italy

FACT FILE

- » **Land area:**
3.93 million sq miles
(10.18 million sq km)
- » **Countries:** 50
- » **Population:**
743.1 million
- » **Largest city:**
Istanbul

Europe

Although Europe is the second smallest continent, it has the world's third largest population. The world's smallest country, Vatican City, is in Europe.



Beijing, China

FACT FILE

- » **Land area:**
17.21 million sq miles
(44.58 million sq km)
- » **Countries:** 48
- » **Population:**
4.44 billion
- » **Largest city:**
Tokyo

Asia

This is the world's largest continent. It also has the largest population and contains the world's largest city—Tokyo, in Japan.

Australia

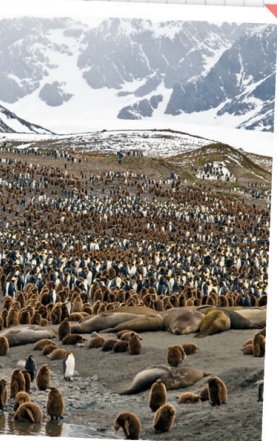
This is the world's smallest continent. It is surrounded by vast oceans. Most people live on islands, or along the coast.

FACT FILE

- » **Land area:**
3.32 million sq miles
(8.6 million sq km)
- » **Countries:** 4
- » **Population:**
36 million
- » **Largest city:**
Sydney



Uluru, Northern Territory



FACT FILE

- » **Land area:**
5.41 million sq miles
(14 million sq km)
- » **Countries:** 0
- » **Population:** 4,000
- » **Largest city:**
McMurdo Station



Masai Mara Reserve, Kenya

FACT FILE

- » **Land area:**
11.73 million sq miles
(30.37 million sq km)
- » **Countries:** 54
- » **Population:**
1.21 billion
- » **Largest city:**
Lagos

Africa

This is the second largest continent and has the most countries. The world's longest river and the world's largest desert are in Africa.

Rural and urban

All over the world, people live in both rural and urban areas. In rural areas, there are few houses and lots of countryside. Many urban areas, such as towns and cities, are full of different buildings, and natural, green places are rarer. People often move between rural and urban areas.

Open spaces

These are common in rural areas. Some are conservation areas that are specially protected.

Facilities

Rural areas often have few or no stores, hospitals, or post offices. People may have to travel to the city to find them.

Settlements

People live in small towns and villages, or even on isolated farms. Many travel to the city for school or work.

Agricultural

A lot of the land in rural areas is used for growing crops and rearing animals for food.

! WOW!

**By 2030,
around 40 cities
will have
populations of
over 10 million!**

Rural

Less people live in rural areas, so they are less built-up and have plenty of open, green spaces. Many people work on farms.



Settlements

Urban areas are very built-up. Houses, stores, offices, and other buildings are crammed in close together.

Facilities

Usually, there are lots of stores, schools, libraries, and hospitals. There may also be sports centers and swimming pools.

Population

In many countries, most of the population now live in towns and cities. This is because there are plenty of jobs and houses there.

Transportation

Most cities have good transportation links. These include roads for buses and cars, railroads, and airports.

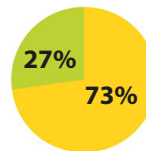
Urban

Large numbers of people live close to each other in urban areas. There are many buildings and roads. People in cities do lots of different jobs.

Rural and urban populations

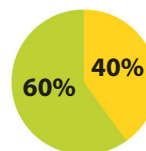
More and more people, across the world, are moving from rural into urban areas, where there are more jobs that are often better paid.

■ Rural
 ■ Urban



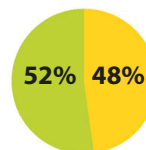
Europe

Most people in Europe live in urban areas. The population of many cities is still growing.



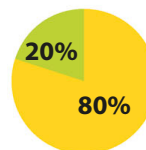
Africa

Here, more of the work is on farms. Therefore, most people remain in rural areas.



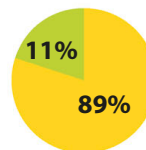
Asia

The world's largest city, Tokyo, is in Asia. But just over half of all Asians live in rural areas.



South America

The urban population here is expanding rapidly. Most people now live in cities.



Australia

Some islands are still very rural, but most people live in cities, dotted along the coast.



North America

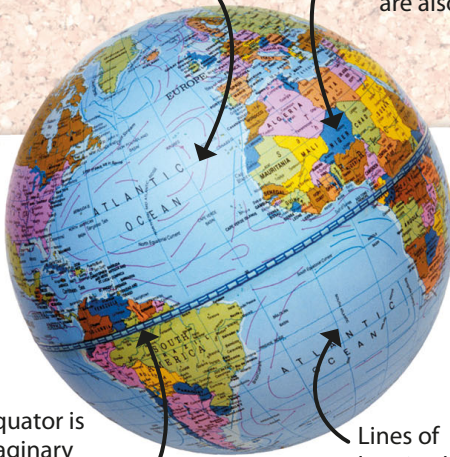
Wide open spaces are common here, but few people live in them. Most prefer city life.

Mapping the world

Maps are a way of picturing the world. They can show a small area, such as your neighborhood, or a very large area, such as the whole world. Different types of map show different things. Some show countries, while others may just show physical features, such as rivers and mountains.

Lines of latitude are drawn across the map.

Different colors are used for different countries, which are also named.



The equator is an imaginary line around the middle of the Earth.

Lines of longitude run from the top to the bottom of the map.

Political world map

A political map shows you the countries of the world. You see where borders and cities are, including national capitals. Imaginary, numbered lines—the equator and lines of latitude and longitude—give you the exact position on Earth of places they pass through.

Physical map

This type of map shows you the natural features in an area. These include mountains, volcanoes, rivers, lakes, seas, oceans, and deserts. Different colors and symbols are used to represent these features.



Street map

This type of map shows where the streets and roads in a town or city are. It will also show bus stops, stations, schools, hospitals, parks, and other useful and important places.

Street and road names are clearly shown on the map.

Important buildings are featured and labeled.



KEY

- Metro station
- Ferry boarding point
- Pedestrian street
- Information

A scale tells you how distances on the map correspond to real-life distances.



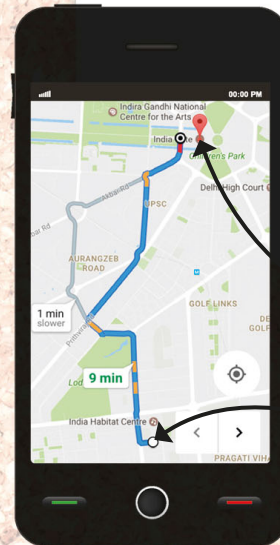
The compass symbol shows you where North, South, East, and West are on the map.

GPS map

This accurate, up-to-date map is created using digital technology.

You can view GPS maps on your phone, tablet, or computer.

They can tell you exactly where you are at any time.



Finish your journey here.

Start your journey here.

Meet the expert

Dr. Amy Donovan works at the Department of Geography, King's College London in the UK. Her special interest is studying how science can help communities deal with the problems of living near active volcanoes. Dr. Donovan also gives talks to schools and at science festivals, and writes for science journals.



Q: We know your job has something to do with geography, particularly hazards, such as volcanoes and earthquakes, but what exactly do you do?

A: Mostly my work involves using scientific and other kinds of information to make decisions about land use and population management around active volcanoes. At the moment, I'm working on how different countries can work together to manage the effects of eruptions.

Q: What made you decide to study geography, and specialize in the problems caused by volcanoes and earthquakes?

A: My first degree was in English, but geography and geology had always been strong interests of mine, so I decided to study geoscience with the Open University. Then I did a MSc in geophysical hazards, and finally a Ph.D. in volcanology!

Q: What is a typical day at work like for you?

A: I work in a university, so I spend a lot of time teaching. But I also have days when I'm out monitoring an active volcano, or gathering information from other scientists and civil protection officials. I might also spend time with people affected by volcanic activity to find out how they deal with the problems that brings. Other days may be spent in the laboratory, studying samples of



Special protective clothing is worn around volcanoes.

volcanic rock, or writing up my research, or attending a conference, or visiting schools and science fairs.

Q: Have you written any books or appeared on television?

A: I've been on television a few times, and sometimes I work as an advisor on programs. I'm writing a book at the moment.

Q: What sort of equipment do you use?

A: At volcanic sites, I use ultraviolet and infrared spectrometers to measure volcanic gases. I also use a lot of specialized software for mapping, and for analyzing the information that I gather from my research. In the laboratory, I use special instruments to measure the compositions of volcanic rocks.



Teamwork is important.

Q: How accurate is it possible to be when predicting an earthquake or a volcanic eruption?

A: It varies quite a lot. Earthquakes cannot be predicted, but we can identify areas that are at more risk than others.

For volcanoes, there are often signs that an eruption is likely to happen.

However, we may not pick them up, because many

volcanoes are not monitored closely, and signs that a volcano is about to become active can be hard to spot. But there have been opportunities to warn people and clear areas successfully before an eruption, such as with Mount Merapi in Indonesia in 2010.

Q: Is your job ever dangerous?

A: It can be! Volcanoes sometimes surprise you, and there have been times when I have had to move very quickly because of a sudden, unexpected increase in volcanic activity.

Q: What do you love most about your work?

A: I love my research. I love working with volcanologists and studying ways that people deal with the problems of living near a volcano. There's a lot to be learned, and it is exciting and satisfying to be involved in protecting a place from serious damage, or even destruction.

Q: What has been your most exciting experience so far?

A: I monitored the 2014–15 Holuhraun eruptions in Iceland. That was fantastic! We were in the Icelandic highlands, which are spectacular. It was the largest eruption there since 1783–84, so it was interesting scientifically, too.



Through a spectrometer

Earth facts and figures

Our home planet is full of really amazing things. Here are some weird and wonderful facts you may not know about it!

550

volcanoes have erupted on Earth's surface since records began. Around 60 are active every year.



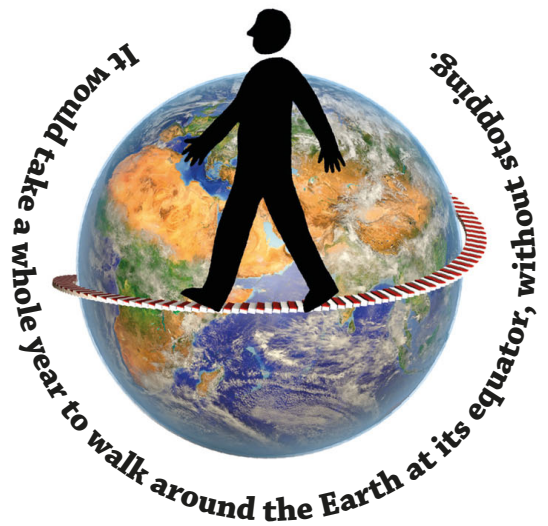
9,000

This is the number of people the world's population grows by in one hour. That's the same as 25 planeloads of passengers arriving on the planet every hour.



10,830°F (6,000°C)

is the temperature at Earth's core. This is hotter than the surface of the sun!



The oldest rocks on the ocean floor are

380 billion years old.

Russia is the **largest country** in the world, covering 11.5 percent of Earth's surface.

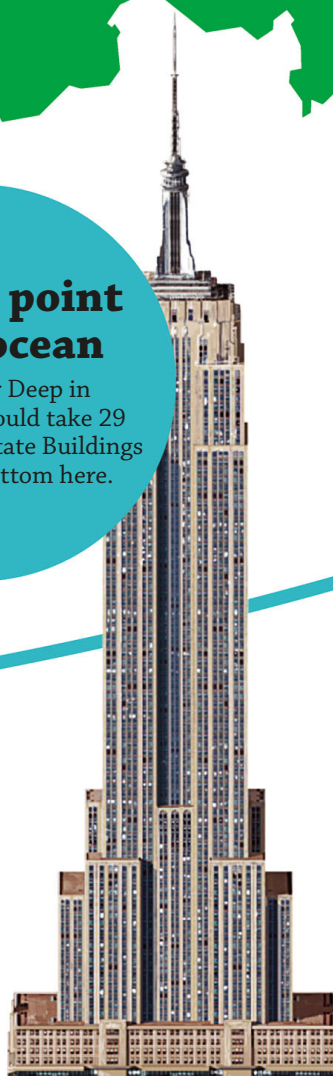


An average cloud weighs as much as a jumbo jet

(but this weight is spread out over a large area).

Deepest point of the ocean

is Challenger Deep in the Pacific. It would take 29 stacked Empire State Buildings to reach the bottom here.



1.4 billion

This is the number of people in China today, the same number that were in the whole world 150 years ago.





Glossary

Here are the meanings of some words that are useful for you to know when learning about the Earth.

atmosphere Thick layer of gases around the Earth that protect the planet from the burning rays of the sun

biome Any main ecosystem on Earth with a particular vegetation and climate

blizzard A wind storm in which snow is blown quickly

cave A naturally occurring space inside a cliff or hillside

climate Weather patterns for a particular area

cloud Lots of very tiny water droplets and sometimes ice crystals

conservation Protecting an area on Earth

continent A large area of land, such as Asia

desert A very dry place on Earth. It has less than 10 in (25 cm) of rainfall every year

Earth The fifth largest planet in our solar system

earthquake Movements in the Earth's crust that make the ground shake violently

equator An imaginary line that runs horizontally around the middle of Earth

erosion Breaking down of rock by weather or water

flooding When a river or the sea overflows and fills land with water

freshwater Water sources that are fresh and without salt

glacier Large mass of ice that moves slowly down a slope

global positioning system (GPS) A radio navigation system that enables people to determine exact locations on Earth and obtain directions

grasslands A large, open area that is covered with grass and often used for grazing animals

habitat Natural home environment of an animal

heatwave A long period of time in which the weather is unusually hot

hurricane A storm with very fast and violent wind

lava Red-hot melted rock that flows out of a volcano when it erupts

map Representation of an area of land or sea, showing features such as borders, mountains, roads, and cities

Coral reef



mineral A group of chemicals forming a solid that occurs in nature, such as crystals

mountain A large landform that rises above the surrounding land, usually with a peak. A mountain is usually higher than a hill

polar Areas near the North and South Poles

pollution Waste that has been dumped in water, in the air, or on land. Pollution can have a negative effect on the environment

population The number of people living in a country or smaller area, such as a city or a town

rain forest An area with heavy rainfall, allowing lots of trees and other plants to grow. Many are also very hot

river A large body of water flowing in a channel to the sea, a lake, or another river

rock A group of minerals, forming a solid that is found underground or on the surface of the Earth

rural In the countryside. The opposite of urban



Atacama Desert, South America



season Yearly cycles of change that affect the weather, animals, and plants. The four seasons are spring, summer, fall, and winter

seismograph A machine that measures earthquakes

snow Ice crystals that fall from clouds and stick together to form snowflakes

solar system The collection of eight planets that revolve around our sun

storm Strong winds, between gale and hurricane force, of 64–75 mph (103–121 km/h)

tectonic plate Giant rocky plates that make up the Earth's crust

temperate An area or a climate with mild temperatures

tornado A thin spiral of air spinning at high speed around an area of extremely low air pressure. Wind speeds may be higher than 200 mph (320 km/h)

tropical An area or a climate with hot temperatures

tundra A cold, treeless area near the North and South Poles, where soil remains frozen for most of the year

urban A built-up area, such as a city or a large town. The opposite of rural

volcano Where hot magma breaks through the Earth's crust with great pressure

weathering The cracking of rocks by weather, plants, or chemicals

wetland Land made up of marshes or swamps



Index

A

Africa 51, 53
agricultural 52
air 6–7
Amazon 50
Angel Falls 33
Antarctica 50–51
Asia 51, 53
Atacama Desert 33
Atlantic Ocean 23
atmosphere 6–7, 60
aurora 6
Australia 51, 53

B

Beijing 51
Benagil cave 31
biomes 34–35, 60
blizzards 39, 60
buttes 19

C

calderas 15
caves 30–31, 33, 60
cities 52, 53, 55, 61
cliffs 28, 31
climate 41, 60
climate change 42–43
clouds 7, 38, 59, 60
compass 55
coniferous forests 35
conservation 36–37, 60
continents 8, 50–51, 60
coral reefs 23
crust 9, 10–11, 16, 61

D

deciduous forests 35, 45

deltas 25, 34
deserts 18–19, 33, 34, 45, 60
Donovan, Dr. Amy 56–57

E

earthquakes 10, 11, 16–17,
56, 57, 60
energy 42
equator 4, 18, 54, 60
erosion 28, 47, 60
estuaries 25
Europe 51, 53
Everest, Mount 32
exosphere 6

F

facilities 52, 53
flooding 25, 39, 60
forests 34–35, 44–45
Fuji, Mount 11, 14

G

glaciers 20, 26–27, 28,
31, 43, 60
Gobi Desert 19
GPS (global positioning system)
55, 60
Grand Canyon 29
granite 48
grasslands 35, 44, 60
Great Barrier Reef 23

H

habitats 34–35, 60
heatwaves 39, 60
Himalayas 13
hurricanes 39, 60
hydrothermal vents 23

I

ice 20, 26–27, 28, 31,
35, 39, 43
ice cave 31
igneous rock 46, 47
Iguazu Falls 24
iron 8, 48
islands 22
Istanbul 51

K

Katmai Peninsula 25
Kilimanjaro, Mount 13
Krubera Cave 33

L

Lagos 51
lakes 20, 47
latitude 54
lava 14, 30, 60
lava caves 30
Li River 25
longitude 54

M

magma 9, 12, 13, 14, 22,
46, 48, 61
maps 54–55, 60
marble 49
Masai Mara Reserve
Mauna Loa 15
McMurdo Station 51
meanders 25
mesas 19
mesosphere 7
metamorphic rock 46, 47
meteors 7
Mexico City 50

minerals 48, 61
mountains 7, 12–13, 24,
26, 32, 34, 47, 61

N

Nevado del Ruiz 11
New York 50
Nile River 32
North America 50, 53

O

oases 19
oceans 8, 9, 20, 22–23, 47, 59
orbit 5, 40
ozone layer 7

P

Pacific Ocean 59
Perito Moreno Glacier 27
planets 4–5, 61
plants 44–45
polar areas 35, 61
pollution 36, 37, 61
population 52–53, 58, 59, 61
Puy de Dôme 12

R

rainfall 21, 29, 33, 38, 39
rain forests 34, 44, 61
record breakers 32–33
recycling 43
ridges, oceanic 23
Ring of Fire 11
rivers 20, 24–25, 28, 32, 61
rock pools 23
rock salt 49
rocks 14, 45, 46–47, 58, 61
caves 30–31
erosion 28, 47, 60
inside Earth 8–9
uses 48–49
weathering 29, 47, 61

Ross Island 19
rural areas 52–53, 61

S

Sahara Desert 18
sand dunes 19
São Paulo 50
satellites 6
scale 55
sea caves 31
seas 8, 20, 22–23
seasons 40–41, 61
sedimentary rock 47
seismographs 16–17, 61
settlements 52, 53
Sierra Nevada 12
Skaftafell cave 31
snow 26, 35, 39, 60, 61
soil 44–45
solar system 4–5, 61
South America 50, 53
St. Helens, Mount 11
stalactites 31
stalagmites 30
storms 39, 61
stratosphere 7
structure of the Earth 8–9
sun 4–5, 38, 40
Sydney 51

T

tectonic plates 10–11, 12,
16, 22, 61
temperatures 6, 8, 18–19, 29,
40–41, 42–43, 58, 61
thermosphere 6
Thurston cave 30
Tokyo 51
tornadoes 39, 61
transport 42, 53
trenches, oceanic 22

tributaries 24
tropical areas 61
troposphere 7
tsunamis 17
tundra 35, 61
turquoise 49

U

Uluru 51
urban areas 52–53, 61

V

valleys 24, 27
Vatican City 51
volcanoes 9, 10, 11, 13, 14–15,
22, 30, 46, 47, 56–57, 58, 61

W

water 4, 8, 19, 20–21, 36, 60
erosion 28, 29
oceans 22–23
rainfall 21, 29, 33, 38, 39
rivers 20, 24–25, 28, 32, 61
waterfalls 24, 33
waves 17, 28
weather 7, 38–39
weathering 29, 47, 61
wetlands 34, 61
wind 28, 29, 36, 38, 61



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