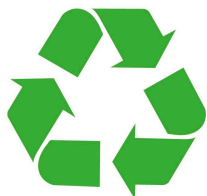


DK findout!

climate change



What do you want to **findout?**

Fun Facts, Amazing Pictures, Quizzes

 **findout!**

Climate Change



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Green sea
turtle



Growing radishes

Contents

- 4 What is climate?
- 6 Climate through time
- 8 The greenhouse effect
- 10 Fossil fuels
- 12 Industrial Revolution
- 14 The ozone layer
- 16 Transport
- 18 What we buy
- 20 Deforestation
- 22 Foodprint
- 24 Polar crisis
- 26 Changing sea levels
- 28 Sinking islands

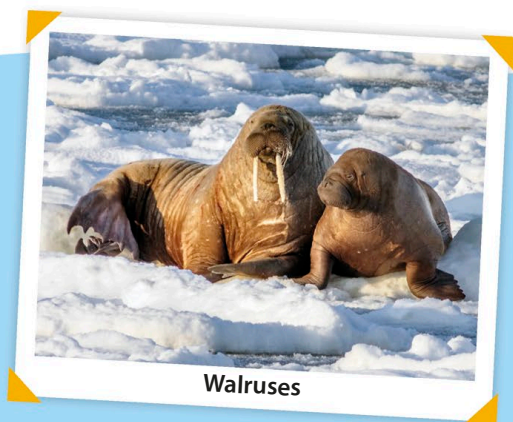


Sustainable
cutlery



Cloth bag for groceries

- 30 Future coastlines
- 32 Coral bleaching
- 34 Extreme weather events
- 36 Grow your own
- 38 Animal life
- 40 Climate migrants
- 42 Carbon footprint
- 44 Earth defenders
- 46 School strikes
- 48 Collective change
- 50 Renewable energy
- 52 Meet the expert
- 54 Living with climate change
- 56 What can I do?
- 58 Fact and figures
- 60 Climate change timeline
- 62 Climate change and health
- 64 Glossary
- 66 Index
- 68 Acknowledgements
- 69 Quiz
- 70 Quiz answers



Walrus



Greta Thunberg

What is climate?

Climate is the average weather conditions in one place over a long period of time. This includes the amount of rainfall, hours of sunshine, and temperature. Earth's climate has varied naturally in the past, but now it is changing more rapidly than ever.

Climate change

The Earth is heating up, which means this polar ice is melting.

What affects climate?

Different parts of Earth experience their own very different climates. These are affected by a variety of factors:



Distance from the equator

Areas of land that are further away from the equator are much colder. Earth's curves mean that the Sun's rays are spread out over a much larger area of land closer to the poles.

Equator

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



Mountains are often snow-covered.

Height above sea level

The higher land is above the sea, the lower its temperature. At the top of Mount Everest, the temperature never goes above freezing!

! WOW!

The city of Sydney, Australia, experiences **seven different microclimates.**



Summer homes are often by the sea.

Distance from the sea

Oceans heat up and cool down much more slowly than land. As a result, places near the coast tend to be cooler in summer and warmer in winter.



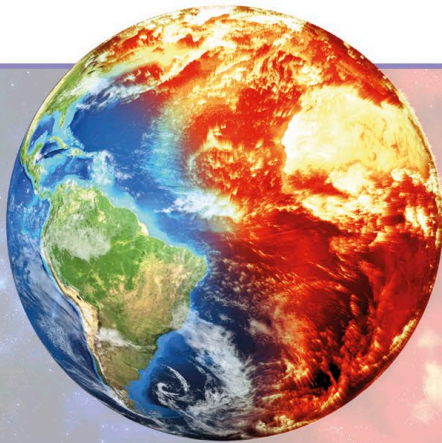
Winds can pick up clouds from the ocean and bring them inland.

Wind direction

Wind blowing from the ocean can bring frequent rainfall, whereas inland wind can create desert microclimates.

Climate through time

Earth's climate has continually changed through time. Natural events – such as variations in Earth's orbit of the Sun, volcanic eruptions, and the impact of meteorites – have caused these changes. To predict change in the future, we can look at what has happened to our climate in the past.



Human impact on climate

Unlike climate change in the past, the current rise in global temperature is mostly the result of human activity. Burning fossil fuels and deforestation are causing a dramatic increase in greenhouse gas emissions (see pages 8–9).

Break up of Pangea

300 million years ago, Earth's continents were joined together as a supercontinent, called Pangea. As Earth's tectonic plates began to move, Pangea began to break apart. Plate tectonic movement also caused volcanic eruptions and earthquakes.

Dinosaurs on Earth

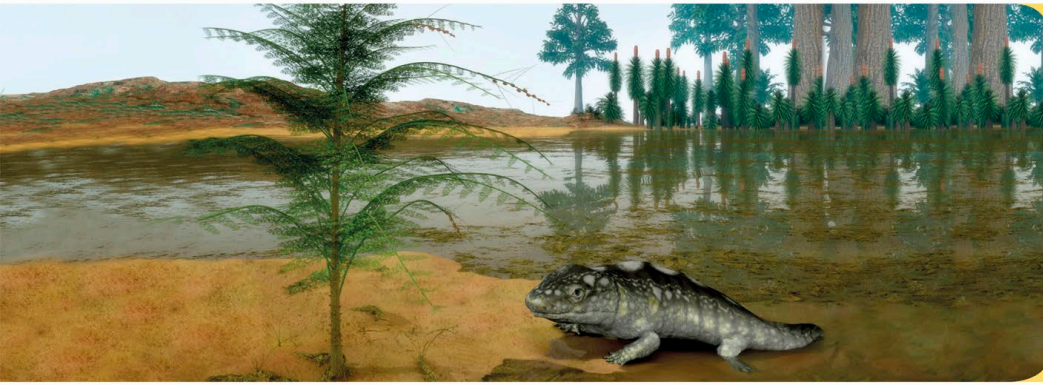
As Pangea began to separate, Earth's climate changed with it. Temperatures dropped and rainfall increased. As more plants grew, dinosaurs began to roam the land. Snakes, insects, and flowering plants also began to appear.

Ice Ages

During an Ice Age, thick sheets of ice cover large areas of land. Earth has had a number of Ice Ages in the past, sometimes lasting millions of years. Ice changed the surface of Earth, eroding land, and causing many of Earth's lakes to form.

Volcanic eruptions

In the past, explosive volcanic eruptions have changed Earth's climate. As smoke and ash were spewed from craters around the world, changes in the atmosphere caused temperatures to alter.



Around 252 million years ago, Pangea suffered a mass extinction known as the Great Dying. Most species that lived on the supercontinent became extinct.



As land carried on separating, dinosaurs continued to evolve. But the changing climate caused many to die. Then 66 million years ago, an asteroid collided with Earth, causing the extinction of all the dinosaurs.



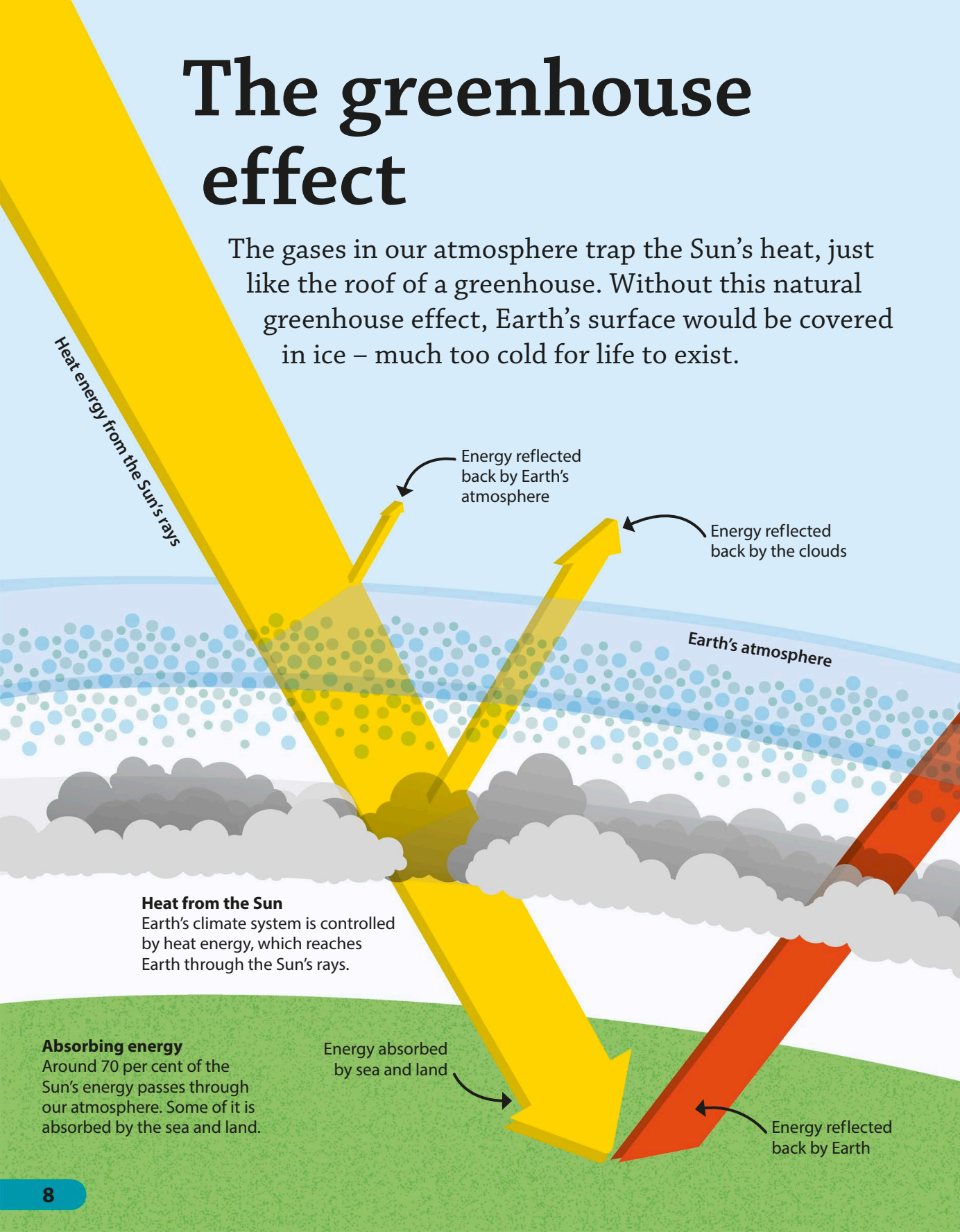
Animals that lived during an Ice Age were adapted to the extremely cold, dry conditions. Woolly mammoths had long hair to keep warm and huge tusks to help them look for food under the snow.



Scientists think that large volcanic eruptions may have been the cause of mass extinctions in the past. As conditions changed quickly, living things did not have time to adapt, so they died.

The greenhouse effect

The gases in our atmosphere trap the Sun's heat, just like the roof of a greenhouse. Without this natural greenhouse effect, Earth's surface would be covered in ice – much too cold for life to exist.



Heat energy from the Sun's rays

Energy reflected back by Earth's atmosphere

Energy reflected back by the clouds

Earth's atmosphere

Heat from the Sun

Earth's climate system is controlled by heat energy, which reaches Earth through the Sun's rays.

Absorbing energy

Around 70 per cent of the Sun's energy passes through our atmosphere. Some of it is absorbed by the sea and land.

Energy absorbed by sea and land

Energy reflected back by Earth

Enhanced greenhouse effect

Human activity, such as burning fossil fuels and deforestation, is releasing more and more greenhouse gases. As a result, the amount of heat becoming trapped by the atmosphere is increasing.

Reflected energy

Some of the Sun's energy is reflected back into space by the atmosphere, clouds, or bright surfaces on Earth, such as snow and sea ice.

Energy reflected into space

Trapping heat

Greenhouse gases in our atmosphere trap the energy reflected back by Earth, which increases the global temperature.

Greenhouse gases

Energy trapped by warm greenhouse gases

What is global warming?

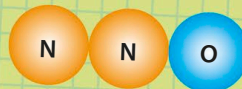
Earth's climate is changing. As humans continue to release greenhouse gases into the atmosphere, the average temperature of Earth is increasing. This global warming is causing extreme weather, changes to natural habitats, a rise in sea levels, and a range of other impacts.



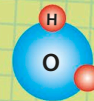
Widespread deforestation causes a rise in greenhouse gases.

Greenhouse gases

Some of the gases in our atmosphere trap energy from the Sun's rays. The main ones are carbon dioxide, methane, nitrous oxide, and water vapour.



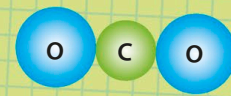
Nitrous oxide



Water vapour



Methane



Carbon dioxide

Carbon dioxide is the most common – and dangerous – greenhouse gas.

Fossil fuels

Buried beneath layer upon layer of rock and other minerals in the ground is a store of coal, oil, and natural gas. Formed over hundreds of millions of years, from dead plants and animals, these materials are known as fossil fuels. Today, much of the world's energy comes from these fuels. However, the excess burning of these fossil fuels harms the environment and our health.

Pollution

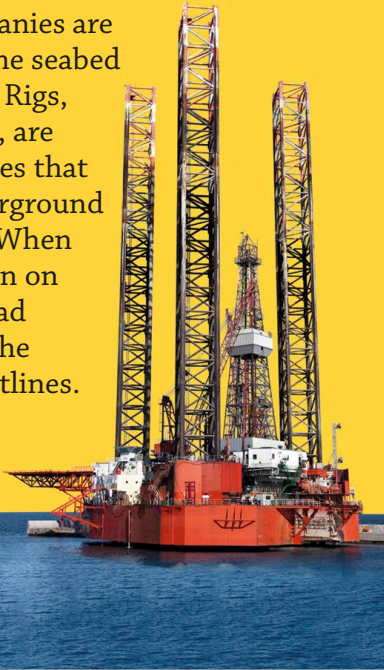
When burned in huge quantities, fossil fuels release polluting greenhouse gases into our atmosphere. Fossil fuels are the largest source of carbon dioxide, the most common greenhouse gas.

CO₂



Oil rigs

As the demand for oil increases, companies are looking under the seabed for stores of oil. Rigs, such as this one, are gigantic machines that drill down underground and extract oil. When accidents happen on rigs, they can lead to pollution of the oceans and coastlines.



TRANSPORTATION

Fossil fuels may have to travel long distances from where they are extracted to where they are used. Transporting flammable fuel risks accidents and produces even more pollution.



MINING FOR FOSSIL FUELS

To extract buried coal, miners dig deep underground. Yet this is dangerous, both for people and the environment, with risks of landslides, flooding, and water contamination.



Fracking

A process called fracking is used to extract hard-to-reach fossil fuels. A powerful jet of water breaks apart underground rock, which releases the fuels. This can cause a number of problems, such as frequent earthquakes and water contamination.

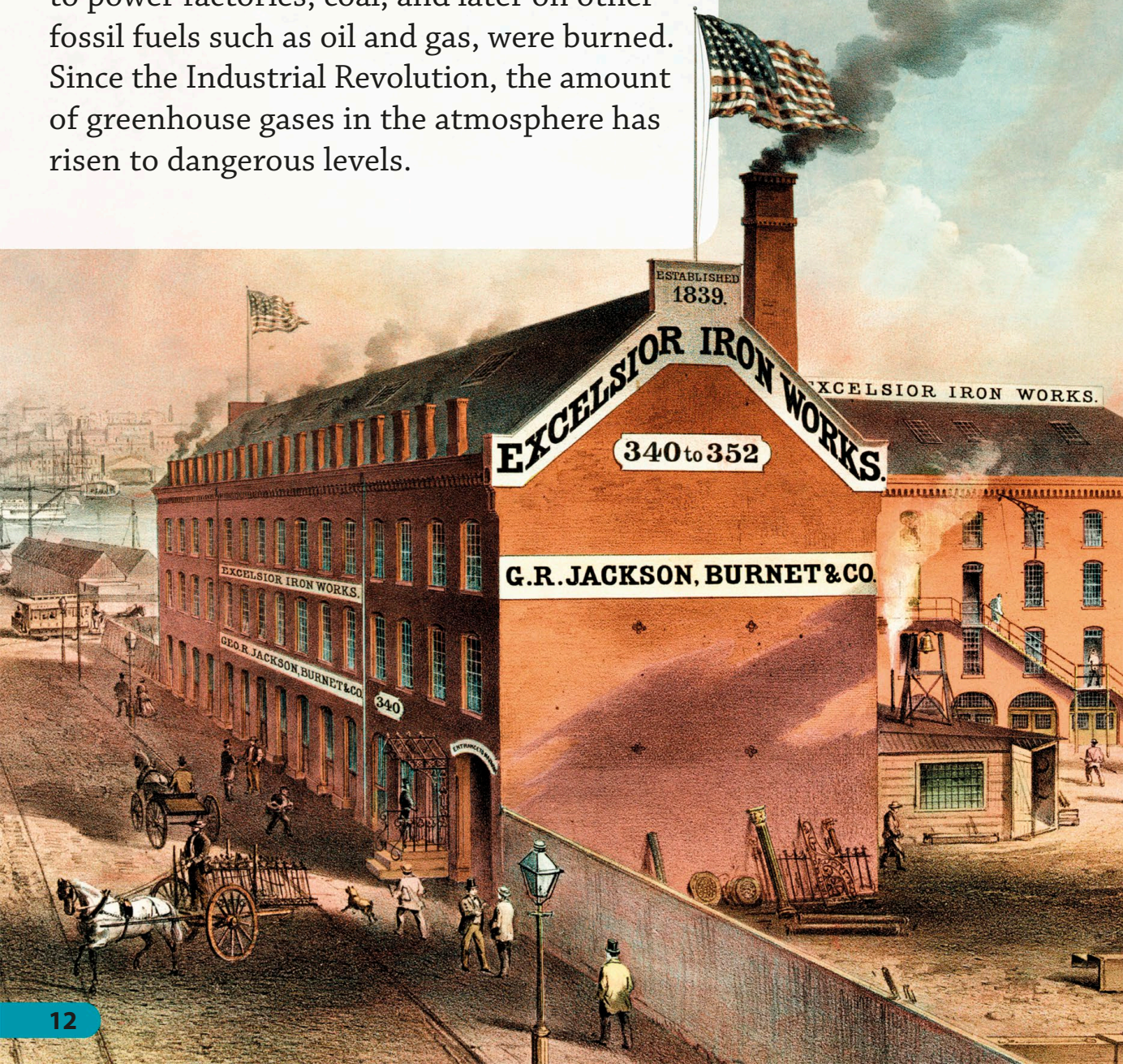


Non-renewable future

We now know that at the rate we are currently using fossil fuels, it is only a matter of time before they completely run out. Fossil fuels form over a long period of time, so it is impossible for us to replace them soon.

Industrial Revolution

The 18th and 19th centuries were an exciting time of great inventions. However, to power factories, coal, and later on other fossil fuels such as oil and gas, were burned. Since the Industrial Revolution, the amount of greenhouse gases in the atmosphere has risen to dangerous levels.

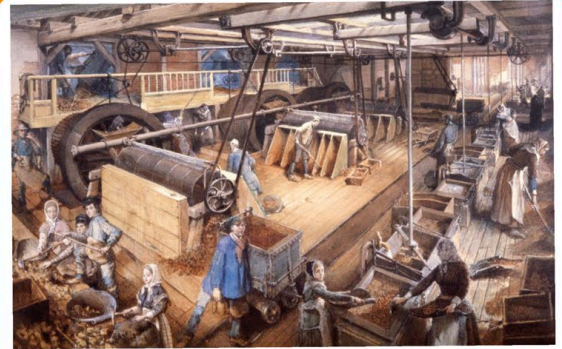


Smoke in the sky

The burning of fossil fuels released large amounts of pollution into the atmosphere including smoke and carbon dioxide (CO₂).

Changes during the Industrial Revolution

New inventions changed people's lives around the world. The battery, the sewing machine, and the telephone were all invented at this time.



Working in a factory

Factories

Huge factories were built to produce goods such as clothing, shoes, pottery, and glassware. The new machinery was much quicker than human labour, meaning products were less expensive and so more people could buy them.



Steam engine locomotive

Transportation

In a steam engine, water is heated in a large tank to make steam. The steam helps make the engine move. Steam engines were used in factories, mines, trains, and steamboats.

The ozone layer

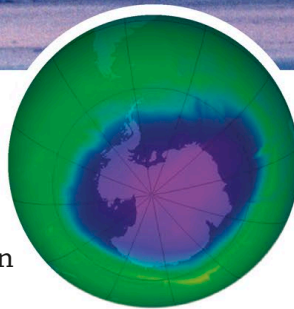
The atmosphere that surrounds Earth is made up of several layers. Part of the layer known as the stratosphere contains ozone gas. Although this ozone layer is thin, it acts as a protective shield by absorbing almost all of the harmful ultraviolet radiation that is travelling to Earth from the Sun.

! WOW!

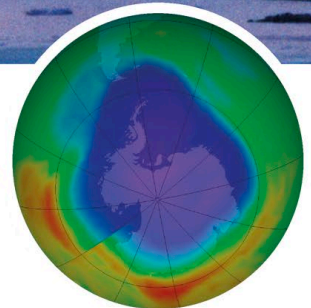
Ozone is a pale blue gas formed from oxygen.

Fixing the ozone layer

In 1985, a hole was discovered in the ozone layer over Antarctica. Following a global ban on harmful chlorofluorocarbon (CFC) gases, the health of the ozone layer is improving quickly.



2010



2012

Protecting Earth

The ozone stops all living things on Earth from being burned by the Sun.

The hole in the ozone layer

Scientists discovered that CFC gases, which were found in aerosol sprays and refrigerators, were causing the hole in the ozone layer to open.

Montreal Protocol

In 1987, countries around the world met in Montreal in Canada and agreed to protect the ozone layer. They banned the use and production of CFCs, which would allow the ozone to recover.



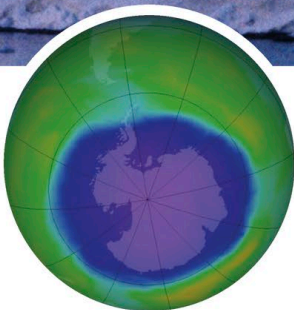
Aerosol spray cans



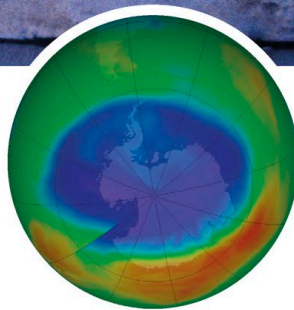
Launching a weather balloon

The road to recovery

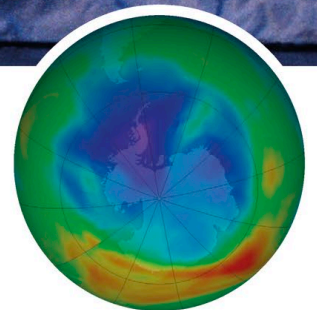
Thanks to the Montreal Protocol, the ozone layer is on the mend. Weather balloons were launched to keep track of the ozone, but satellites are more often used now. Scientists think that the hole will disappear by 2060.



2015



2017



2019

Transport

Travelling from A to B in vehicles is one of the biggest causes of climate change. Most of our transport relies on fossil fuels, which release carbon dioxide (CO₂) and other pollutants into the atmosphere. As a result, people around the world are being encouraged to walk or cycle.

Flying around

Over 100,000 flights leave airports around the world every day! Plane travel is a huge contributor to climate change.



Diesel trains
Harmful gases
are released.



Trains powered by fossil fuels are being replaced by electric trains.

Train travel

Railways need a lot of energy. Although fewer trains use fossil fuels in their engines now, train travel relies on electricity, which sometimes involves burning fossil fuels.

On the road

Most petrol and diesel cars are powered by fossil fuels, which release harmful carbon dioxide into the atmosphere.

Electric cars are more environmentally friendly, as they release no pollution.



Queues of traffic release high amounts of pollution.



Huge cargo ships take fruit, vegetables, and other foods all around the world.

Food miles
 By looking at the distance food travels from where it is made to where it is eaten, we can look at the impact our food has on the environment.

Taking the bus

Buses are a big contributor to air pollution, but a bus full of passengers is about 10 times less polluting than if they all travelled by car.



Clean transport
 Electric-powered vehicles and biofuels are growing in popularity. Made from renewable and sustainable natural materials, biofuels are much better for the environment.



Growing algae fuel

How much travel produces 1 kg (2½ lb) of CO₂?

The amount of carbon dioxide released into the atmosphere depends on the mode of transport that is used. Look at these types of transport. Which ones do you use? How can you contribute less to CO₂ emissions?



4 km
(2 miles)



14 km
(9 miles)



24 km
(15 miles)



18 km
(11 miles)



15 km
(9 miles)



70 km
(43 miles)

What we buy

From expensive gadgets and fashionable clothing to disposable food packaging and plastic straws, the things we buy have an enormous impact on the environment. Earth's natural resources, water supplies, and fragile ecosystems are suffering as a result of our lifestyle.



Factories make products to be shipped all over the world.

Factory production

Factories use lots of energy and resources to make large quantities of objects to sell. Products are then shipped across the world for people to buy, producing even more greenhouse gases.

Fast fashion

Fashions come and go, but the environmental impact lasts for ever. Making cotton and polyester for clothes releases large amounts of greenhouse gases, while unwanted clothes end up in landfill.

Cotton field



Fabric dyes are sometimes dumped in rivers.



! WOW!

In France, shops are **banned from destroying unsold food and clothes**. Instead, they give them to charity.

Rubbish that is thrown away mostly ends up in landfill.

Waste disposal

Although we are becoming more conscious about recycling, waste that can't be reused or recycled is buried in the ground. This is a huge problem, as some waste takes hundreds of years to break down and releases methane into our atmosphere.



Reusing containers and bags helps the environment by reducing single-use waste.

Sustainable alternatives

Simple changes can be kinder to our environment. For example, swap aluminium foil for reusable beeswax wraps, and single-use plastic bottles for refillable steel or glass bottles.

Some zero-wasters, such as environmental activist Bea Johnson, manage to keep all their year's waste in a single jar!



Beeswax food wrap



Zero-waste living

By reducing what we consume and reusing as much as we can, it is possible to live a zero-waste lifestyle in which nothing is sent to landfill.

Deforestation

Forests around the world are under threat. Humans are chopping down trees at an alarming rate, and this is having a devastating impact all over the world.



Carbon storehouses

After oceans, forests store the most carbon on Earth. Trees absorb carbon dioxide, preventing it from entering our atmosphere and contributing to climate change.

Forests cover
30 per cent of
land on Earth.



Satellite
image of
the Amazon.

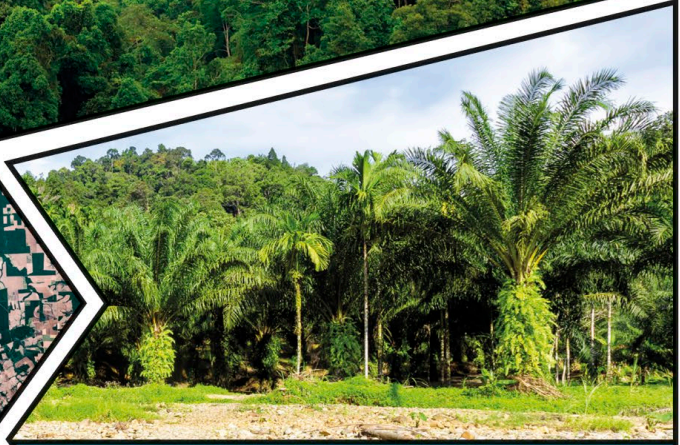


Amazon rainforest

The Amazon is the world's largest rainforest. Unfortunately, more than 20 per cent of the Amazon has already been destroyed by humans, and the rate is increasing.

Clearing the land

Large areas of forest are cleared to create grazing land for cattle. Land is also used for plantations, such as soy and palm oil, which destroy animal habitats.



Logging

Trees are cut down to provide timber and pulp, which are used for making paper, furniture, construction material, fuel, and other products.



**chop!
chop!**



Building sites

Thousands of trees are often cleared to make new roads, dams, housing, and tourist resorts. Chopping down trees puts even more pressure on the environment.

Soil erosion

The roots of trees hold soil in place, helping to protect it from being eroded by rainwater. If trees are chopped down, soil is easily washed away. This can block rivers, cause flooding, and contaminate water.

Reforestation

Planting more trees is an important step in our fight against climate change. Reviving cleared areas of forest can prevent further soil erosion, recover habitats, and reduce the amount of carbon dioxide in the atmosphere.



Planting new trees to combat climate change

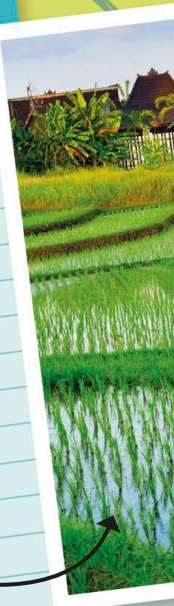
Foodprint

Whatever you eat, your food has an impact on the environment. This can be measured using a foodprint. Although many of the processes involved in food production are invisible to the customer, they can take a huge toll on our soil, water, and air.

Food crops

Although it is considered an important staple food for many, rice is a key contributor to greenhouse gas emissions. Flooded rice fields produce large amounts of methane, a powerful greenhouse gas.

Rice fields also let off nitrous oxide, commonly known as laughing gas.



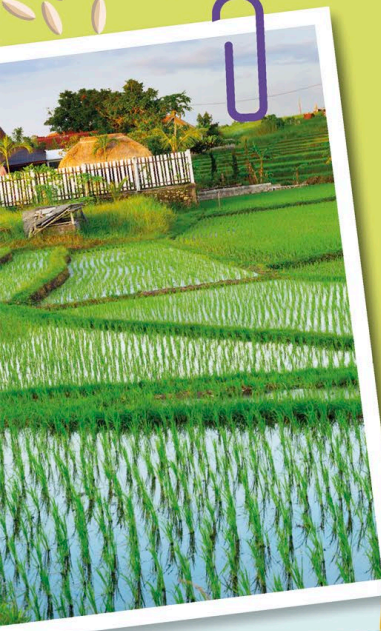
Cows release methane when they burp. On average, a single cow can burp up to 200 litres (53 gallons) of methane per year.



Livestock farming

Raising animals for food – such as meat, eggs, and milk – is one of the highest causes of deforestation and water pollution. Trees are cut down to make space for cows to graze. Livestock farming is to blame for 14.5 per cent of global greenhouse gas emissions.

WOW!
It takes more than **1,000 litres (264 gallons)** of water to produce a **chicken breast**. That would fill a bath more than **12 times!**



Meat-free diet

Reducing the amount of meat you eat is a good place to start in the fight against climate change. Most plant-based foods have a much less damaging impact on the environment than those that come from animals.



These tasty falafel balls are made from chickpeas and herbs.

Set yourself a challenge to waste less food each week.



Food waste

Whether on farms and fishing boats, or in supermarkets and restaurants, food is wasted at each stage of production. When we waste food, we waste the energy and water used to produce it.

Alternative sources of protein

Two billion people around the world eat insects, and this alternative source of protein is becoming even more popular. Insects take up significantly less land, water, and feed than farm animals.



Crickets are 64 per cent protein.

Polar crisis

As global temperatures rise, Earth's poles are warming faster than any other place on Earth. Disappearing snow, sea ice, and glaciers in the polar regions is having an impact around the world, putting the lives of many animals and people at risk.



Sea ice is melting at an alarming rate.

The Arctic

The Arctic is vulnerable to rising temperatures. Animals are losing their homes and the people who live there are feeling the effects of the changes.



Animals' habitats are melting.

The Antarctic

Rising temperatures are causing glaciers to melt. A decrease in Antarctic krill, small sea creatures, is threatening the lives of whales, seals, and penguins, who eat them to survive.

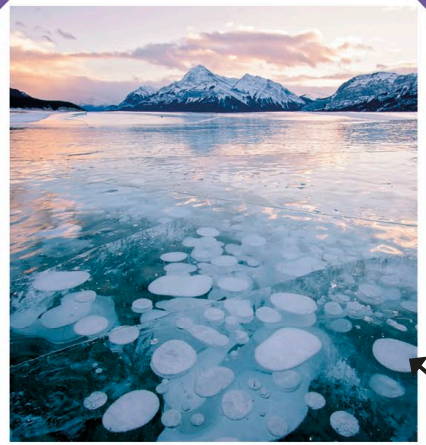


Struggling to survive

Melting ice means that animals, such as this polar bear, are becoming endangered.

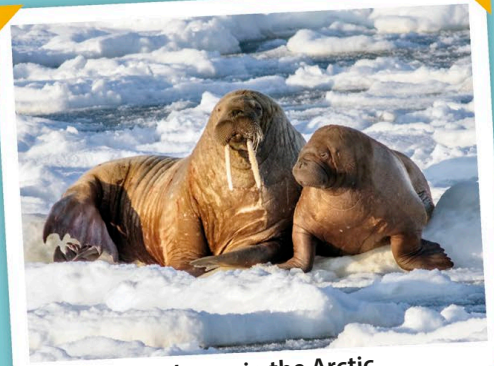
Global consequences

As land ice melts, sea levels rise, which threatens low-lying land and coastlines. Changes in the poles could also cause changes to climate and weather patterns around the world.



Methane bubbles trapped in water

When melting takes place, methane is released into the atmosphere adding to the greenhouse effect.



Walrus in the Arctic

Habitat

Many animals rely on sea ice to survive. As their habitats change and disappear, walrus, polar bears, seals, and penguins are put under threat.



REALLY?

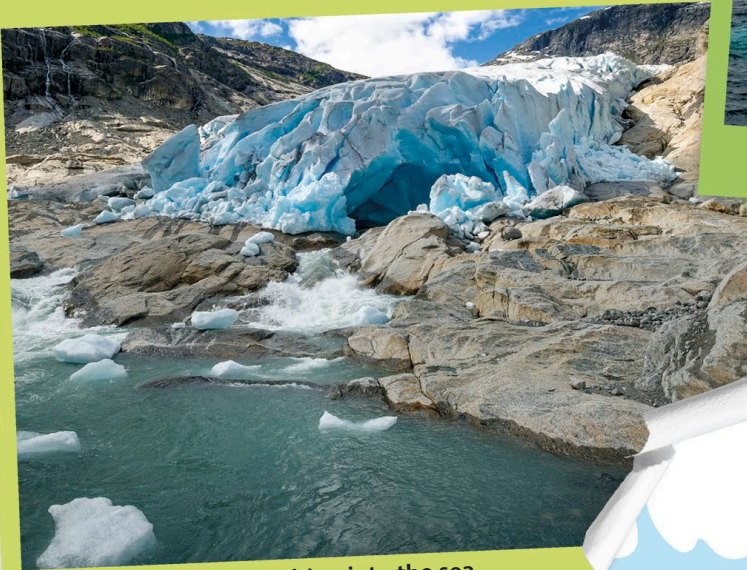
The area of snow-covered Arctic land is expected to decrease by 10–20 per cent in the next 70 years.

Changing sea levels

Rising global temperatures are causing sea levels to rise. As Earth gets warmer, ice sheets and glaciers melt, which adds more water to the sea. The dramatic change in sea levels is one of the most worrying impacts of climate change.

Meltwater

As well as in the sea, there is a lot of ice on land in the form of ice sheets and glaciers. With the rise in global temperatures, land ice is beginning to melt. This is known as meltwater. As land ice melts, towns could become flooded.



Ice on land is melting into the sea.

Thermal expansion

When water gets warmer, it expands. As climate change drives Earth's temperature up, the ocean is getting warmer, which means it is getting bigger. This is causing sea levels to rise further.



Rising temperatures cause ice to melt and water to expand.

! WOW!

At the current rate, **sea levels will rise by 65 cm (26 in)** by the year 2100.



The ocean is absorbing CO₂.

Absorbing carbon dioxide

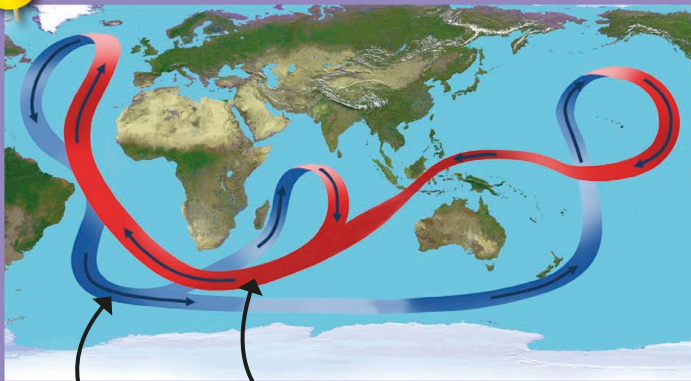
As more carbon dioxide enters the atmosphere, our ocean soaks it up. If the ocean reaches the point at which it can no longer absorb any more gas, the amount of carbon dioxide in our atmosphere will increase further.

Habitat loss

Changing sea levels are having a devastating impact on wildlife, causing habitat loss, difficulty in surviving, and drastic changes to food supply.



Animals are losing their homes.



Cold water comes from the poles.

Warm water flows up from tropical areas.

Ocean current slowdown

When sea ice melts, it causes an increase in cold freshwater flowing into our oceans. This interrupts the circulation of saltwater, slowing down the ocean current. Our weather and sea life could be affected by the slowdown.

Hurricanes and tropical cyclones

Warmer ocean temperatures and higher sea levels are predicted to strengthen hurricanes and tropical cyclones, meaning they will cause even more damage when they hit land.

Climate change causes extreme weather.



Sinking islands

As the global temperature continues to warm up, ice is melting, oceans are expanding, and sea levels are rising. Hundreds of millions of people worldwide are at risk since they live on islands and in low-lying coastal regions.



Tuvalu Islands

Rising seas and coastal erosion are drowning low-lying areas of land. Two of Tuvalu's nine islands are on the verge of being swallowed by the sea. Tuvalu is the fourth smallest nation in the world and is home to 11,000 people.

FACT FILE

» **Number of islands:**

Three reef islands and six true atolls

» **Location:** Oceania, Pacific Ocean



FACT FILE

» **Number of islands:**

Chain of 26 atolls

» **Location:** South Asia, Indian Ocean



The Maldives

At the current rate of sea level rise, the Maldives could be underwater by 2100. The small coral islands are being flooded by extreme weather events.



Green sea turtles have fewer places to lay their eggs.

The Seychelles

This group of islands is sinking. Ocean warming is also having a devastating impact on their coral reefs. The people and wildlife that live in the Seychelles are under threat of losing their homes.

A warbler that lives on Aride Island, Seychelles.



FACT FILE

» **Number of islands:**

115 islands

» **Location:** South Asia,
Indian Ocean



FACT FILE

» **Number of islands:**

More than 900 islands

» **Location:** Oceania,
Pacific Ocean



The Solomon Islands

Five tiny islands have disappeared due to rising sea levels and erosion, and six more have had a large reduction in their shorelines. The population in the Solomon Islands is more than half a million people.

Future coastlines

Climate change is affecting the world's coastlines in a variety of ways. Rising sea levels, more frequent storms, and warmer ocean temperatures are having a devastating effect on the coast. The future of our coastlines is uncertain, with the lives of people and wildlife at risk.

Coastal erosion

Coastal erosion is quickening. Land is being engulfed by the sea, which can damage buildings and infrastructure, costing a great deal to repair. As sea levels rise, the impacts of coastal erosion are difficult to predict.

Gold Coast, Australia

Sand has been deposited in vulnerable areas of the beach as a buffer against future storms and coastal erosion.



Changing coastlines

With over 600 million people living in coastal areas that are less than 10 m (33 ft) above sea level, many coastlines need to be protected against the effects of climate change.



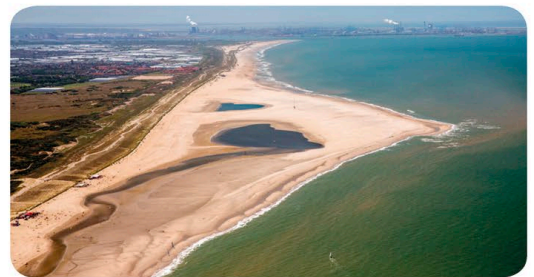
Buildings in New York, USA

In response to rising sea levels and storm events, coastal protection projects will ensure buildings and drainage can cope with frequent flooding.



River erosion in Bangladesh

Researchers have suggested building floating homes when land is eroded. The homes could be built to cope with extreme weather events.



The Sand Engine, Netherlands

The Sand Engine deposits sand along the coast to protect the low-lying land from sea water.

Coral bleaching

Colourful reefs made up of the skeletons of coral are at risk around the world. As Earth's oceans heat up due to climate change, the algae that provide food for the coral are forced from the reef. The coral turns white and becomes much weaker.

The Great Barrier Reef

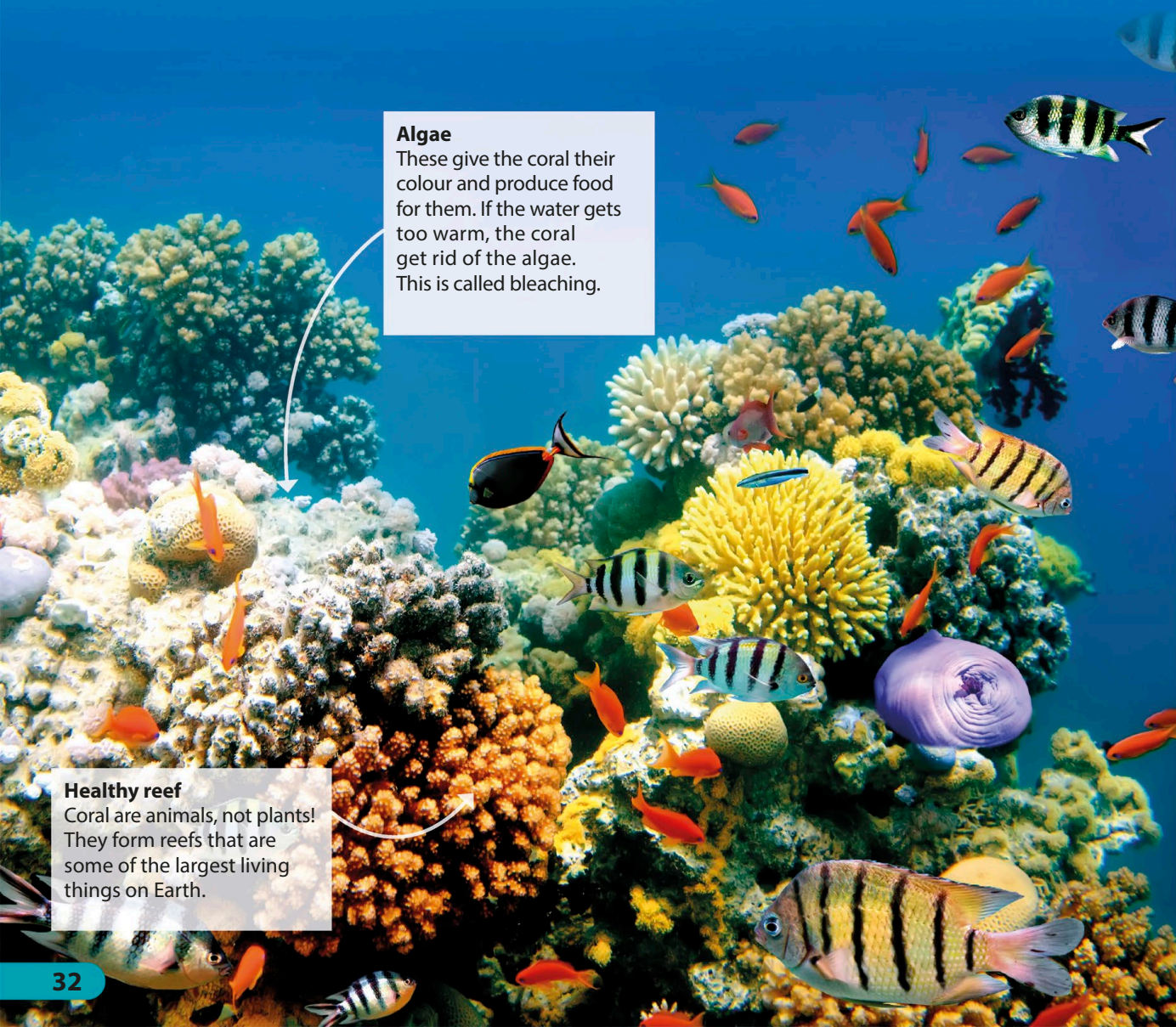
Bleaching in the world's largest coral reef has resulted in fish, turtles, and sea birds losing their habitats.

Algae

These give the coral their colour and produce food for them. If the water gets too warm, the coral get rid of the algae. This is called bleaching.

Healthy reef

Coral are animals, not plants! They form reefs that are some of the largest living things on Earth.



Impact on humans

Millions of people rely on coral reefs. They protect shorelines from being worn down by waves, or getting flooded. The sea life that rely on coral for food or shelter are eaten by lots of people. Coral, and the plants and animals that inhabit it, are also used to make some medicines. If reefs become damaged or die, this could affect people's homes, ability to get food, and health.



The bleaching of coral reefs could mean fewer fish to catch.

Sea life

Coral reefs are home to 25 per cent of all marine species on Earth. If the reef dies, many of these will lose their home.

Bleached reef

Coral without algae turns pale. It is weaker without its main source of food and is more likely to become diseased or die.

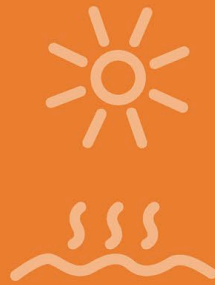
Extreme weather events

Changes to Earth's climate are triggering variations in weather patterns. Extreme weather events – such as heat waves, droughts, storms, and flooding – are becoming more common and intense, having unpredictable and damaging impacts.



Heat waves

Heat waves are periods of unusually hot weather lasting days or weeks. They are particularly dangerous to people who are very young, very old, or who have health problems.



Blizzards and hailstorms

Climate change has made Earth's atmosphere warmer. A warmer atmosphere holds more water. When colder weather comes so do blizzards and hailstorms as

the atmosphere has more water stored up ready to be released. Hailstones can cause widespread danger and damage.



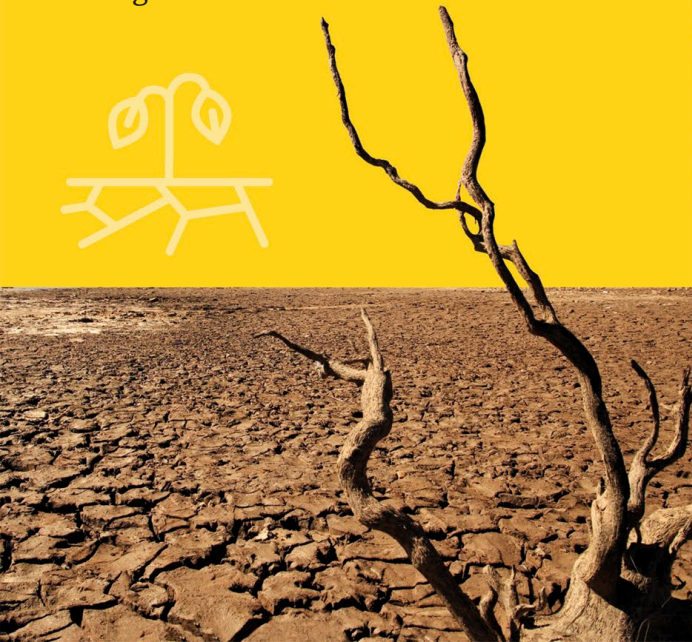
Floods

A warmer atmosphere stores more moisture, so rainfall is becoming more severe. This increases the likelihood of flood events, including flash floods that are unexpected and intense, as well as coastal flooding.



Droughts

A drought is triggered by a stretch of unusually dry weather and not enough rain. It can lead to a number of long-term problems for animals and people, including a shortage of water and damage to food sources.



Tropical storms

Warmer surface temperatures of the ocean and water in the atmosphere are causing tropical storms to become more intense. Climate change is also leading to more areas north of the equator experiencing them.



Grow your own

Growing your own vegetables is a big step towards helping to save the planet. Without the need to ship food around the world, we can reduce the amount of pollution produced and the plastic waste that is thrown away. Start by growing these simple tomatoes.



1



Sow

Fill a seed tray with seed compost. Sprinkle tomato seeds onto the compost and cover with 6 mm ($\frac{1}{4}$ in) more compost. Keep the seeds in a warm place. When the seedlings start to grow, move to a sunny position.

2



Transplant

When the plants are ready, carefully move two or three of them from the seed tray into a large container with drainage holes, filled with compost. Firm the compost around the plants, making sure all the roots are covered.



Composting

Making your own compost is a great way to use up old vegetable peelings, grass cuttings, leaves, and cardboard. Keep filling your compost bin with kitchen and garden waste. After it has rotted, give your plants some compost to help them grow.

Do not put cat or dog poo, nappies, magazines, cooked food, oil, meat, or fish in your bin.

Attach your plant to a stake for support.

3



Harvest

Put the plants back in their sunny spot and keep them well watered as they grow. When tiny fruits begin to appear, feed the plants with tomato food to help them ripen. Pick when they are bright red.

Other vegetables you can grow

Try growing these tasty veggies, too. If you don't have access to a garden then you can grow lots of salad vegetables in pots on a windowsill or a balcony.



Growing carrots

Carrots

In spring or autumn, plant your carrots in rows 30–60 cm (1–2 ft) apart. Seeds should be planted about 1.25 cm (½ in) deep and 2.5–5 cm (1–2 in) apart.

Pick the carrots around 12 weeks after planting.

They are best eaten soon.



Growing radishes

Radishes

Plant the seeds about 3 cm (1 in) apart, and around 1 cm (½ in) deep. Keep the soil well watered – they grow quickly. Your radishes will be ready to pick in three to four weeks.

Animal life

Many animals around the world are being affected by climate change. Higher temperatures, rising sea levels, and changes in weather conditions will present new challenges for survival, including habitat loss and changes to the availability of food. Will our wildlife be able to adapt?

! WOW!

By 2100, up to 50 per cent of all species could be extinct due to climate change.

Hawaiian honeycreepers

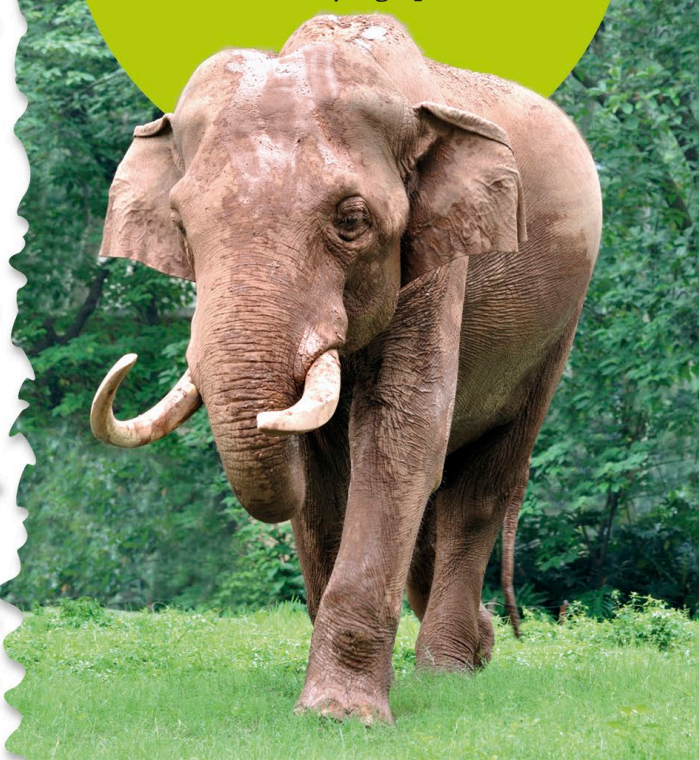
Found in the higher altitudes of Hawaii, honeycreepers are usually protected by the cool temperature.

As temperatures rise, malaria-carrying mosquitoes are biting and killing off these colourful birds.



Asian elephants

Asian elephants are sensitive to high temperatures. Climate change is making it more difficult for these elephants to find the large amounts of fresh water they need to survive as water sources are drying up.



Taking part

The RSPB in the UK run a Big Garden Birdwatch every year. It is the world's largest garden wildlife survey. Counting and recording the birds you see in your garden or local area allows scientists to know which birds are doing well and which are in trouble. Taking part is even more important as we face a changing climate.



All you need is a notebook, pen, and binoculars. Ask an adult to help you and always stay safe.

Sea turtles

Rising sea levels and warming temperatures are having a devastating impact on this endangered species. Disappearing nesting beaches, warming sand, and bleached coral reefs are affecting their chances of survival.



Adélie penguins

Adélie penguins feed on small sea creatures, called krill, which shelter under Antarctic ice. As the ice melts, the krill can't survive. The penguins must travel further to find food, causing their chicks to wait longer for a meal.



Climate migrants

The impacts of climate change are forcing people from their homes, cities, and even countries. Rising sea levels, extreme weather events, droughts, and water shortages are destroying communities. It is likely that more and more people will be forced to migrate (move to a new place).



In 2017, more than 8,000 firefighters fought against the flames in California.

California

Throughout California, rising sea levels, higher temperatures, and extreme wildfires are forcing people to leave their homes and move elsewhere.



Peru

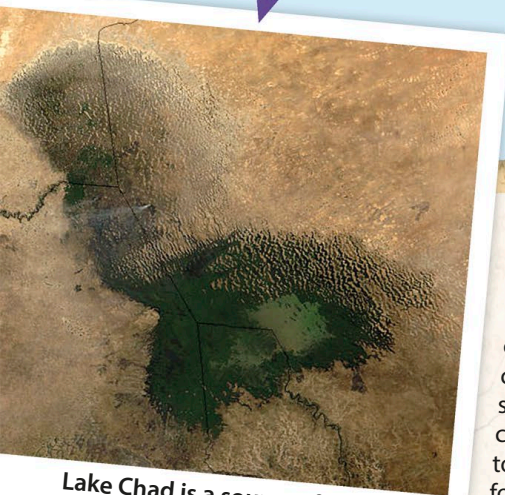
Rising temperatures are causing glaciers in Peru to melt. As nearby lakes become swollen with meltwater, the risks of flooding are putting people nearby in severe danger.



The diminishing Pastoruri glacier at the Cordillera Blanca mountain range in Peru.



Millions of people are affected by flooding in Bangladesh.



Lake Chad is a source of water to millions of people.

West Africa

The rise in population, increase in water being used to grow food, and climate change have all contributed to Lake Chad shrinking in size by 90 per cent. As conditions continue to worsen, people are forced to migrate.

Bangladesh

Coastal areas of Bangladesh are particularly vulnerable to flooding and typhoons (tropical storm), which are becoming more frequent as sea levels rise. Many Bangladeshis have already migrated to the capital, Dhaka, to escape the worsening impacts of global warming.



Gavutu Island, Solomon Islands

Pacific Islands

Low-lying islands are being affected by rising sea levels, coastal erosion, and increased flooding. More than 40 per cent of households predict that they will have to move to another country soon.

UNHCR

The United Nations High Commissioner for Refugees is taking action to support those affected by the impacts of rising global temperatures.



UNHCR refugee camp

Carbon footprint

Almost everything we do releases carbon into our atmosphere, from driving a car to buying food. Your carbon footprint is a measure of the total amount of carbon dioxide that you release in your day-to-day activities. Why not try walking to school to reduce your carbon footprint?



Switch it off

Turning off lights and plugs can significantly reduce the amount of electricity you use, which means less carbon dioxide is produced.



Buy local

Buying food that is grown locally can reduce your carbon footprint. Transporting food over long distances releases lots of carbon dioxide into our atmosphere.



REALLY?

Globally, we emit more than 1,130,000 kg (about 2,500,000 lb) of **carbon dioxide** every second.

Sustainable transport

Walking, cycling, or taking public transport are environmentally friendly ways to travel, as they release less pollution.



Ecological footprint

Your ecological footprint is the amount of Earth's natural resources needed to support your lifestyle. This includes the amount of land and water needed to produce the things you use, such as food, paper, and energy.

Consider what you eat

Eating less meat and dairy is a simple way to reduce your carbon emissions. Vegetarian and vegan diets have considerably lower carbon footprints.



Earth defenders

People are important in the fight against climate change. Some individuals have supported projects to help lessen our impact on the environment, while others have encouraged people to stop damaging Earth. We can all do things in our daily lives to help reduce climate change.



Leonardo DiCaprio, USA

Actor Leonardo DiCaprio has used his fame to speak out against climate change. He often attends protests and has set up an organisation to support projects that provide solutions to climate change.



George Monbiot, United Kingdom

Since stopping a tree being cut down aged eight, George Monbiot has written many books and news articles about the importance of the environment. He has called for immediate action against climate change.



The Green New Deal

In 2008, activists wrote up a list of changes that countries could make to help the environment. They called this the Green New Deal. The list included clean or energy-efficient transport, manufacturing, and buildings.



GREEN NEW DEAL

Some US politicians have argued in favour of the Green New Deal.

Greta Thunberg, Sweden

At 15, Greta Thunberg began skipping school to protest against climate change outside the Swedish parliament in 2018. Her speeches have inspired millions to become involved in the #climatestrike movement. In August 2019 she travelled in a solar-powered yacht to the US to give a talk as she wanted her journey to produce zero carbon.



Ma Jun, China

After noticing the high levels of pollution in his country's capital city, Beijing, Ma Jun set up a scheme to monitor the air there. He has written books and raised awareness about the effects of pollution.



Vandana Shiva, India

Named an environmental hero by *Time* magazine in 2003, Vandana Shiva started a national movement in India that championed environmentally friendly farming.



School strikes

Millions of schoolchildren around the world are marching for their future. Fed up of waiting for politicians to act, children are demanding immediate action to address the climate crisis. As school strikes continue to grow, will the world start to listen?

! WOW!

The Global Climate Strike of 2019 took place in **185 COUNTRIES.**



#FridaysForFuture

Instead of going to school on Fridays, Greta Thunberg sat outside the Swedish parliament building.

#FridaysForFuture soon went viral as children around the world began to join her.



Speaking up

The speeches that Greta has given have inspired people around the world.



Having their say

Young people are asking the government to involve them in decision making linked to global warming, so that they can have a say in their future.

Get involved

If you feel strongly about protecting your future against climate change, you can join the movement. Always ask an adult for permission and to help you stay safe. Follow the hashtags #FridaysForFuture and #ClimateStrike for more information about how you can get involved. FridaysForFuture are a peaceful striking organization.



Make a sign that stands out.



#YouthStrike4Climate

The #YouthStrike4Climate movement demands urgent action against the climate crisis. Schoolchildren around the world are participating in weekly or monthly protests for climate justice.



#GlobalClimateStrike

On 20th September, 2019 there was a Global Climate Strike, where more than 7.6 million people around the world followed the lead of schoolchildren and took to the streets to demand urgent action against climate change. Children missed school in order to strike.

Collective change

Climate change is the greatest environmental challenge Earth has ever faced. As our planet continues to warm, both people and wildlife are affected. Many organizations are trying to protect our future against climate change. You can search online to find out more about these organizations.

World Wildlife Fund



If we fail to act against climate change now, one in six species are at risk of extinction. WWF are working with people in power to stop nature being destroyed.

Friends of the Earth



Friends of the Earth believe that big changes can start small. Their Climate Action groups are suggesting local solutions to a global crisis, campaigning for a fairer, greener world.

Extinction Rebellion



As Earth faces a global emergency that could lead to mass extinction, this organization is bringing people around the world together to express their concerns through non-violent protesting.

Amazon Watch



Campaigning to protect the Amazon rainforest, this organization works with environmental groups to stop the destruction of the rainforest and support indigenous people.

Sierra Club



The Sierra Club brings people together to build a powerful and effective environmental movement. They believe that there is no time to waste in the fight against climate change.

Ocean Conservancy



As climate change threatens our oceans, Ocean Conservancy is developing solutions for a healthy ocean and the many communities and wildlife that depend on it.

Greenpeace



In over 40 countries around the world, Greenpeace take peaceful action to protect our Earth. Dedicated people come together to support a greener, healthier planet.

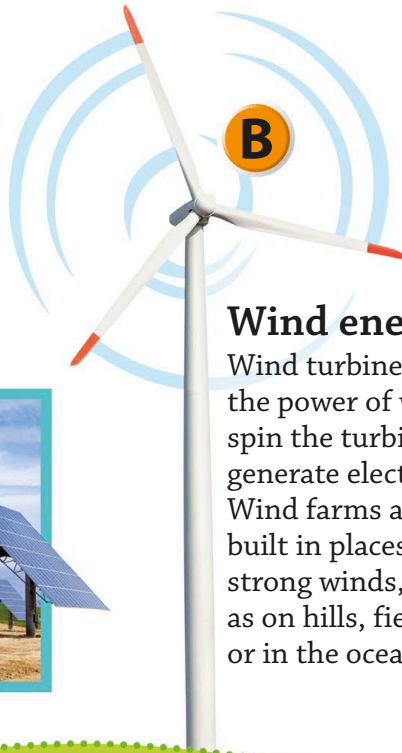
Match the sources with the energy types they produce.

Renewable energy

Unlike fossil fuels, renewable energy is made from natural resources that won't run out, such as the Sun, wind, and water. The energy produced generates few waste products and has a low impact on the environment. Many countries are reducing their use of fossil fuels by adopting renewable energy sources.

Solar energy

Solar panels collect the Sun's energy and turn it into electricity. The panels can be placed almost everywhere in the world, or even in space.



Wind energy

Wind turbines use the power of wind to spin the turbines and generate electricity. Wind farms are often built in places with strong winds, such as on hills, fields, or in the ocean.

Hydro energy

Hydro energy is made when flowing water turns turbines, which generate electricity. Hydropower provides around 16 per cent of the world's electricity.



1

What kind of energy do wind turbines produce?

2

What kind of energy is obtained from tides?

3

What kind of energy can be generated from the power of water in motion?

4

What kind of energy is derived from sunlight?



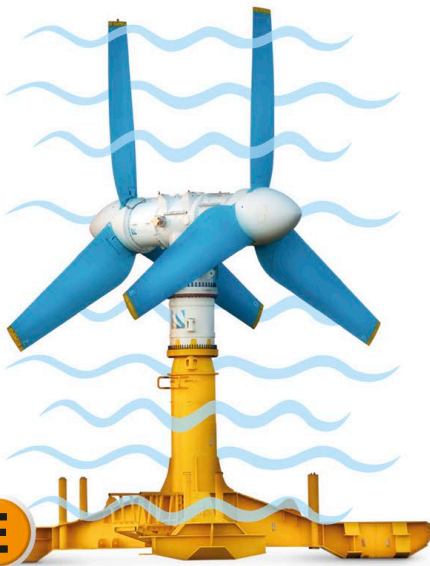
D

Biomass energy

Biomass is organic material which comes from plant and animal waste, which contains energy absorbed from the Sun. When burned, this energy is released and can be used as fuel.

Tidal energy

Similar to hydro energy, tidal energy uses the sea's waves to spin turbines and produce electricity. This is more reliable than the Sun or wind, since the tides are more predictable.



E

Wave power

A range of technologies have been developed to capture the energy from the movement of waves. Much like hydro and tidal energy, waves move up or down to spin a turbine, which generates electricity.



Waves generate a lot of energy.

F



Geothermal energy

Below the Earth's surface are stores of steam and hot water known as geothermal energy. Power plants use this energy to heat and cool buildings, or to generate electricity.

! WOW!

Iceland is the only country which generates all of its energy from renewable sources.

5

What kind of energy is harnessed from hot water below the Earth's surface?

6

What kind of energy can be derived from plant materials and animal waste?

Meet the expert

We put some questions to Alice Fraser-McDonald, who is doing research into the levels of methane gas released by trees growing on landfill sites. She is studying for a PhD in Environment and Waste Management at the Open University.



Q: What are you studying at university?

A: My research looks at trees growing on landfill sites that are not accepting rubbish anymore. I am trying to find out if the trees are giving out or taking in greenhouse gases, particularly methane.

Q: What inspired you as a child?

A: As a child I was really lucky to have lots of days out in the countryside and trips to the zoo with my family, and this meant that I became interested in nature and animals. I continued studying these subjects and I especially enjoyed biology and geography at school and university. I have carried on developing these interests and that led me to become a PhD student.

Q: Why did you decide to focus your learning and research on trees?

A: I did a project on trees which I found really interesting and I particularly liked studying how trees can relate to climate change. There are so many trees on the planet, and they are involved in lots of different processes, so they are very important to study.

Q: What is your usual research day like?

A: I spend quite a few days in my office reading scientific research and sorting through the data I have collected. The most exciting days are when I get to go and visit field sites to take measurements from trees. On these days I take all my equipment to my sites and spend the day going from tree to tree measuring the methane and lots of other things like the temperature and how big the tree trunk is.

Q: How will the information be used to help with understanding climate change?

A: At the moment no one knows if the trees growing on these closed landfill sites are giving out or taking in greenhouse gases, so my research aims to find this out. When I have finished collecting data, I should know whether the trees are helping to

slow down climate change by taking in methane, or contributing towards climate change by channelling methane from the rubbish out to the atmosphere. Hopefully I can then say whether or not we should be planting trees on these sites.



Equipment used to measure greenhouse gases

Q: What are the best and worst parts of your research?

A: I really enjoy being able to go out to my field sites and take measurements. I like knowing that no one has done this research before so whatever I find out will be completely new. The worst part of my research is probably when it rains when I am out at my field sites!

Q: What special equipment do you use?

A: I use a greenhouse gas analyzer when I am collecting data in the field. It is a big yellow box which I connect with tubes to a chamber on the tree trunk. The gases in the chamber on the tree trunk go through the tubes and into the greenhouse gas analyzer. The analyzer tells me exactly which greenhouse gases they are and how much of each is in the chamber.

Q: Who else do you work with?

A: I work with other people at the university who help me with my research. I have supervisors who give me feedback and help to guide my research. There are also technicians who help to make my equipment and show me how to use it. I also have people who come into the field and help me take measurements from the trees; usually this is my family!

Q: What is your biggest wish for the future?

A: I am hoping that my research, along with lots of other climate change research, can help us to understand climate change and greenhouse gases better and come up with ideas to try to slow down climate change in the future.



Alice measures the methane gas emissions from trees trunks and then writes up her findings.

Living with climate change

In the face of a changing climate, it is important that we learn to deal with the risks and consequences. By taking practical action, it is possible to minimize or prevent the damage that global warming will have on our lives. Play this game to learn more.

Roll a die and begin exploring.



START

Are you ready to learn about the impacts of climate change?

Find out what measures are being taken to adapt to the impacts of climate change and how technology can help us.

The Paris Agreement

The Paris Agreement, opened to signatures in 2015, is the first global deal to fight the climate crisis. The Agreement requires all Parties to adapt to the impacts of climate change.



UN conference in 2017 to discuss Paris Agreement goals

1 Hundreds of people living near the coast are being relocated as the rising sea level has led to high flooding risk. Miss a turn!

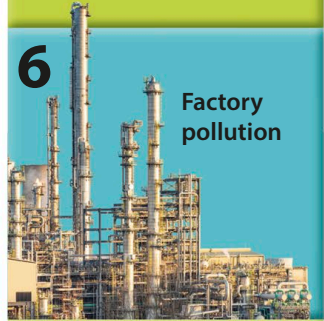
2 Coastal erosion



3 Some countries have started building floating structures as an adaptive measure. Roll the die again!



6 Factory pollution



5 Farmers are using drought-resistant crops. Move forward one space.



4 Floating apartments



8 Deforestation



7 The concentration of carbon dioxide (CO₂) in our atmosphere is the highest it has been in 3 million years. Move back three spaces.

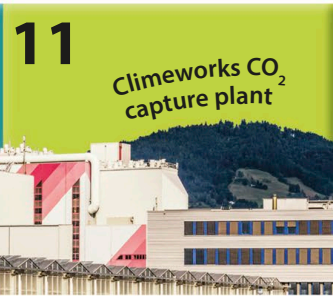
9 120 sq m (1,292 sq ft) of forest is cut down to make a tourist resort. Move back to the start.



10

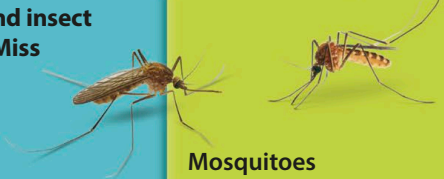


11 Climeworks CO₂ capture plant²

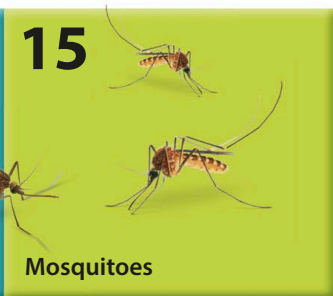


12 A CO₂ capture plant has been completed. Roll the die again! These plants capture atmospheric carbon with a filter, stopping it entering the atmosphere.

16 Due to increased heat, there have been droughts and insect outbreaks. Miss a turn!



15



Mosquitoes

14 Seawall



13 In the USA, Staten Island's 8 km (5 m) seawall project is finalized. Move forward two spaces.

17 MethaneSAT will be launched in 2022. Roll the die again! This satellite will make it possible to "see" methane emissions across the globe.

18 MethaneSAT



19 Drones help with reforestation. Move forward one space. BioCarbon, a UK-based company, has been using drones to spray tree seeds in damaged forests.

20 Drone



24 Many countries are burning less fossil fuels. Roll the die again! In 2017, Sweden produced more than half of its energy from renewable sources.

23 Forest fire



22



21 A forest fire breaks out due to prolonged heat waves. Move back one space.

25 Bullitt Center



26 A new block of smart buildings is built. Move forward one space. The Bullitt Center in Canada has solar panels across the roof that supply enough energy for the whole building.

Congratulations!
You've finished the game.
 However, there is still a lot of work that needs to be done to effectively adapt to the changing climate.

FINISH





Add a scarf and wear gloves inside if it's really cold.



Avoid plastic

99 per cent of plastic is made using oil and gas, which is responsible for 5 per cent of global emissions. Ask your parents to swap single-use plastic for reusable products.



Use wooden utensils.

Hot and cold

Heating your home uses a huge amount of energy. If you're feeling cold, don't turn up the heating – put on a cosy jumper to keep warm.



Open a window if you're too warm.

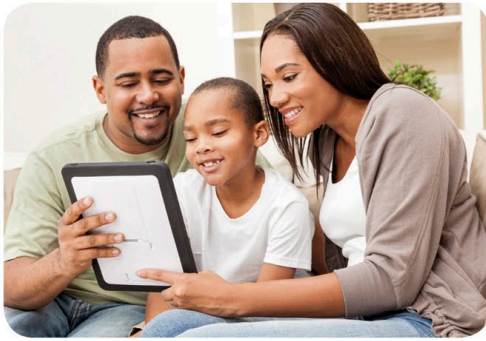
What can I do?

We are already feeling the effects of climate change around the world. There are plenty of simple changes we can make to help reduce our greenhouse gas emissions and combat climate change.

Air dry

Your tumble dryer uses electricity to generate heat, adding to your carbon footprint. Switching to a clothes rack or washing line saves energy and can be more efficient on a sunny day.





Ask adults to help you.

Calculate your impact

Use a carbon calculator online to work out exactly how much carbon you produce. Understanding where emissions come from will help you to make small changes to reduce your impact on climate change.

Your voice matters

You can help in the fight against climate change. Use your voice to influence others to change their habits and make a difference.



Write a letter to your local government.

Fix it

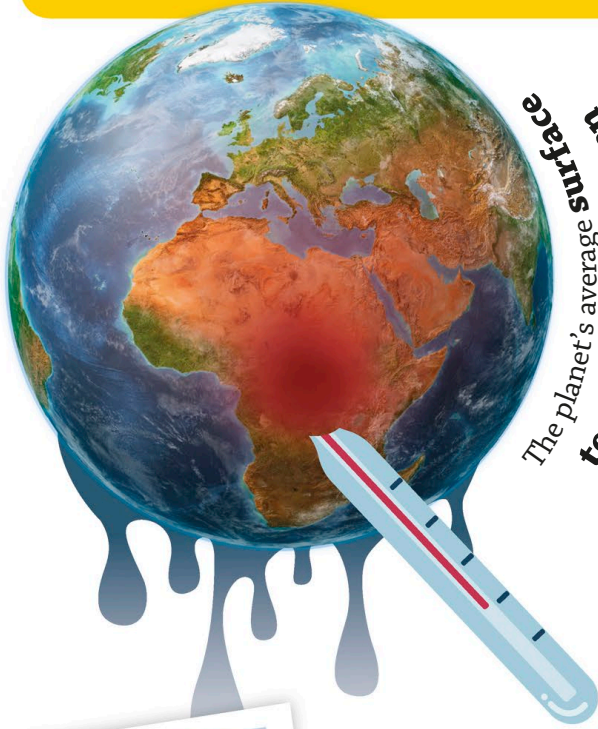
Today's throwaway society is putting pressure on our planet, wasting resources and energy. Next time something appears to be broken, don't just replace it – try to fix it.

Ask an adult to help you learn how to sew a button onto a shirt.



Facts and figures

Climate change is impacting the world around us. Here are some interesting facts you may not know about our warming world.



The planet's average surface temperature has risen since 1880 by about **0.8°C (1½°F)**



The **Amazon** Rainforest is called the “**lungs of the world**” as it **removes** about **two billion tonnes** of carbon dioxide a year from the air. Cutting down forests is reducing this and also releases the CO₂ previously stored by the forest.



40%

or so of the carbon dioxide releases that are removed from the atmosphere are taken up by the oceans.

152

cubic kilometres (36 cubic miles) of ice have been lost in Antarctica every year since 2002.

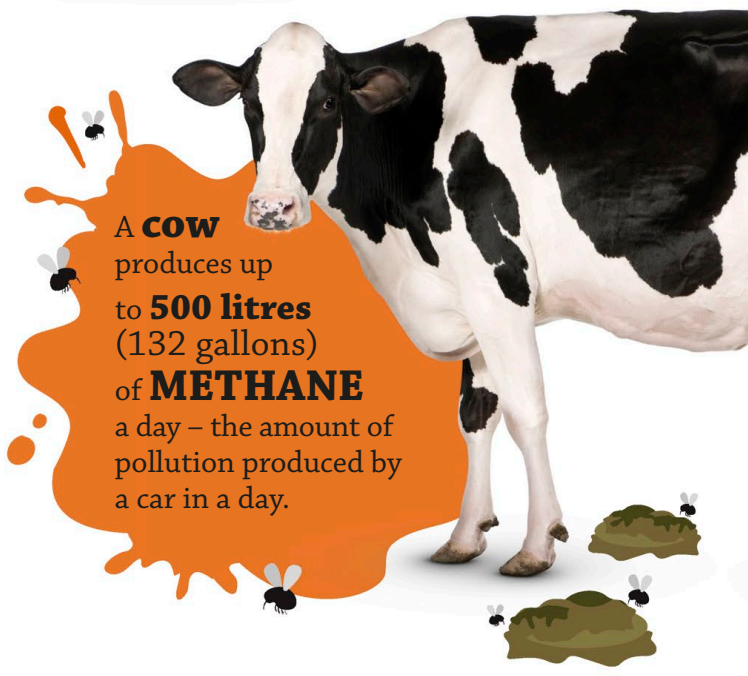




Vulcanol™ is the world's **first renewable transport fuel** from non-biological sources of energy.



Young activists across the world have sued **five countries** for failing to act **against climate change**.



A **cow** produces up to **500 litres** (132 gallons) of **METHANE** a day – the amount of pollution produced by a car in a day.

30 football pitches per minute is the rate at which the world's tropical forests are shrinking.



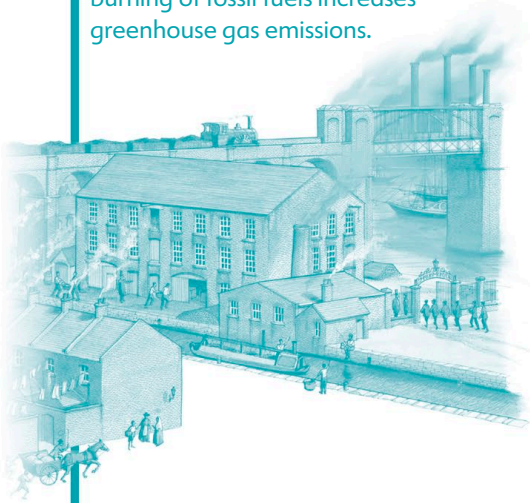
195

countries have signed and adopted the Paris Agreement, committing to global climate action and adaptation to change, as well as the strengthening of climate goals.



Industrial Revolution

Huge factories, new machines, and railways are built, but the burning of fossil fuels increases greenhouse gas emissions.



1760s

1824

1887

1988

1990

1994

1997

Montreal Protocol

Governments around the world pledge to restrict emissions of chemicals that damage the ozone layer.

The Earth is warming up

The IPCC finds that temperatures have risen by 0.3–0.6 °C (0.5–1°F) over the last century. This is due to human activities which have increased greenhouse gas emissions and enhanced the greenhouse effect.



Big plans

Global warming is a big problem, so the UN plans to stabilize greenhouse gas levels.

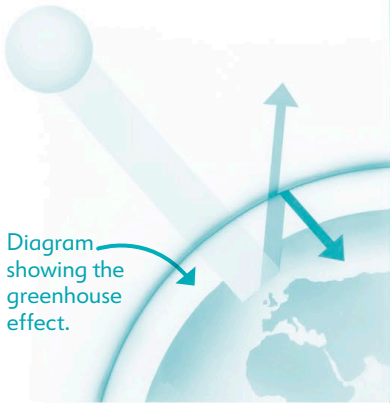


Diagram showing the greenhouse effect.

The “greenhouse effect”

Physicist Joseph Fourier discovers that Earth’s atmosphere traps the Sun’s heat – now known as the “greenhouse effect”.

IPCC investigations

Two United Nations (UN) organizations set up the International Panel on Climate Change (IPCC) to look at what we know about climate change.



UN and UNEP flags



Kyoto Protocol

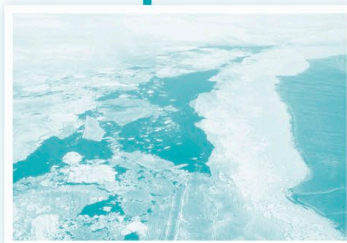
Signed by UN members, the Kyoto treaty aims to decrease greenhouse emissions and reduce our carbon footprint.

Climate change timeline

Follow the timeline to find out how greenhouse gas emissions have increased dramatically since the Industrial Revolution.

Global emergency

The IPCC blames humans for global warming. It demands that governments take action.



Melting sea ice

Ice is melting

Arctic sea ice is at its lowest amount than ever before. Only 3.41 million sq km (1.32 million sq miles) of ice is covering the ocean.



Plane travel emits large amounts of CO₂.

CO₂ in atmosphere

Levels of carbon dioxide in the atmosphere reach higher than they have ever been in the last 800,000 years.

2006

2007

2012

2015

2018

2050

Carbon concerns

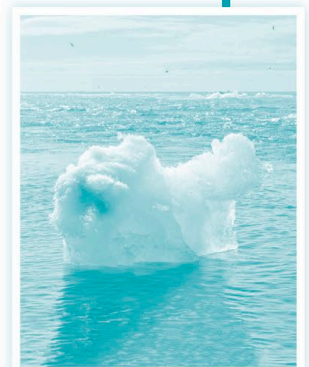
Carbon emissions from fossil fuel burning, factories, and industry reach a dangerously high 8 billion tonnes per year.



Talks at the Paris Summit

Earth's future

Small alpine glaciers will very likely disappear completely, and large glaciers will shrink by 30–70 per cent.

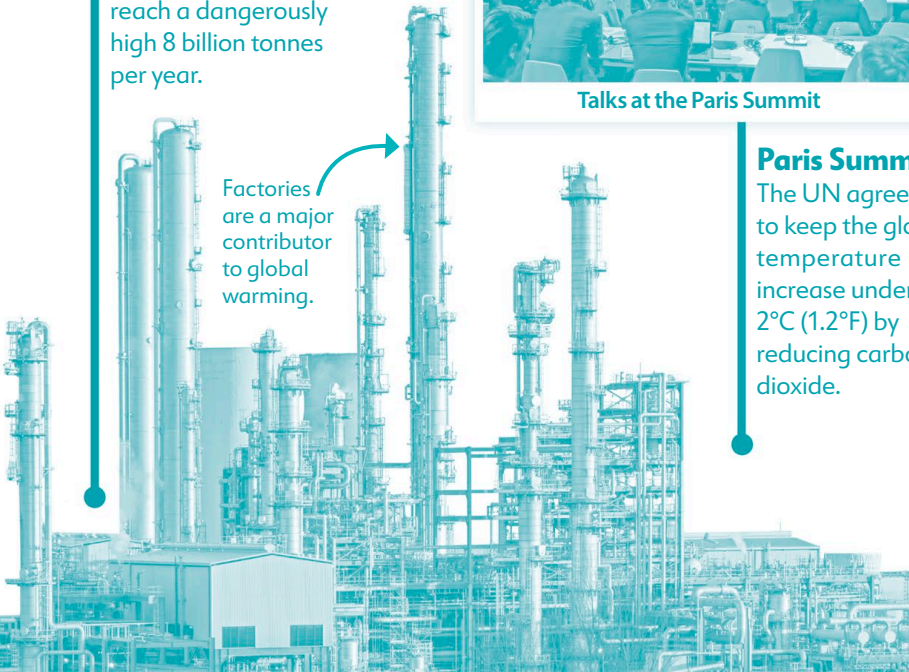


Shrinking iceberg

Paris Summit

The UN agrees to keep the global temperature increase under 2°C (1.2°F) by reducing carbon dioxide.

Factories are a major contributor to global warming.



Climate change and health

RISING TEMPERATURE

If global temperature continues to increase at its current rate, we could see additional warming of 0.5°C (1°F) by 2040, which could have severe impacts on our health.

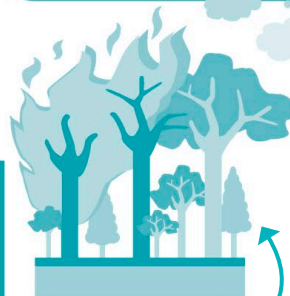
EXTREME WEATHER

Tropical storms, hurricanes, floods, and heat waves are all increasing because of climate change. Extreme weather events can have a number of associated effects that can put our lives at risk.

Frequent heat waves



More intense wildfires



As the average wildfire season is getting longer, the number and severity of wildfires is increasing.

Increased heat



Heat stroke

Dehydration

Increased temperatures make it harder for humans to stay hydrated which can lead to kidney disease.

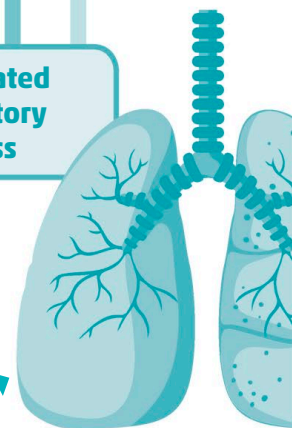


Crop failure and hunger



Aggravated respiratory illness

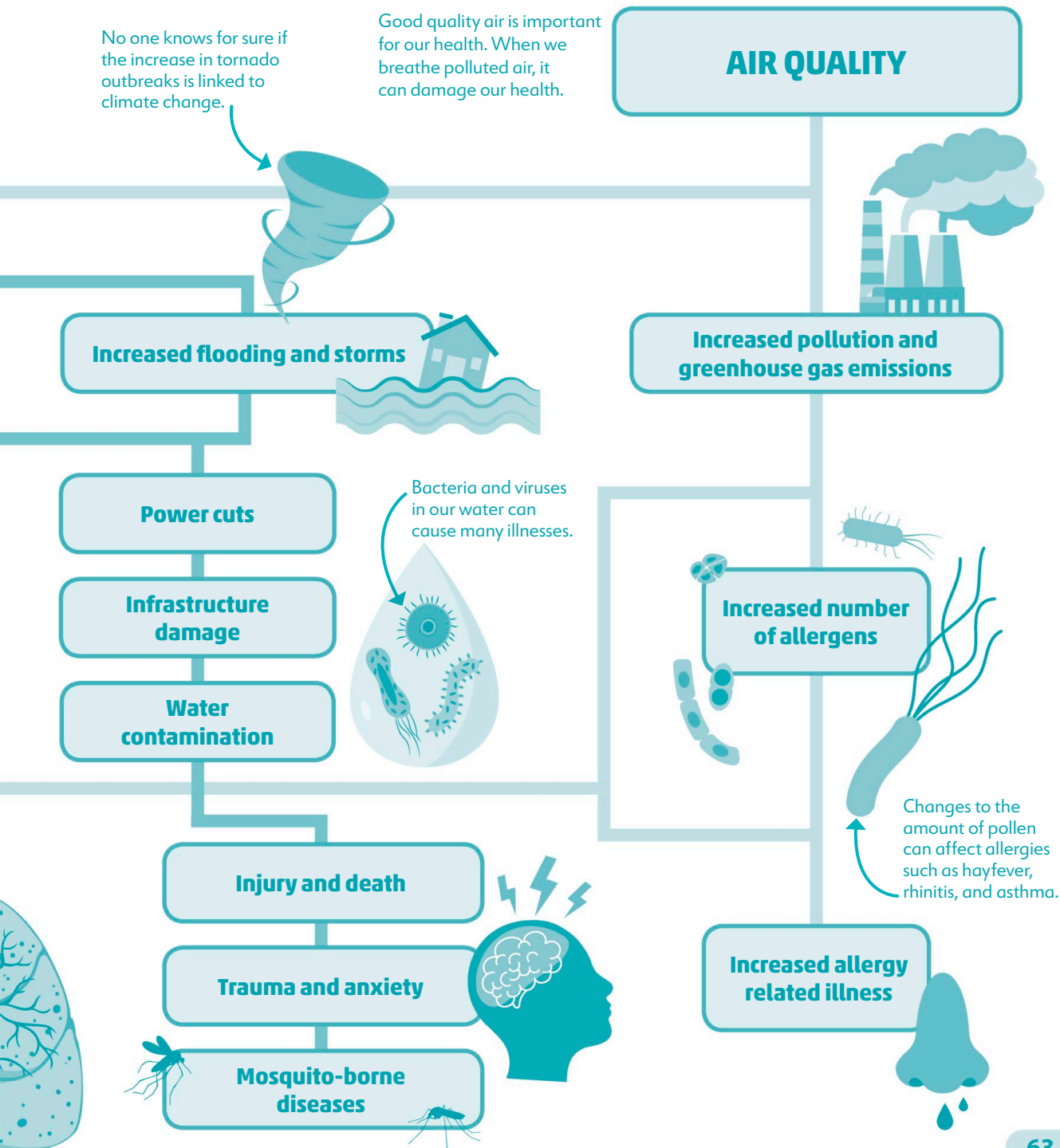
Pollutants can cause respiratory illness, such as asthma, and make it worse for people who already have it.



Climate change will affect different people in different ways, but overall it will be bad for everyone's health. Children, elderly people, and those already with medical conditions are most at risk.

No one knows for sure if the increase in tornado outbreaks is linked to climate change.

Good quality air is important for our health. When we breathe polluted air, it can damage our health.





Glossary

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

activist A person who campaigns to bring about change

asteroid A rocky object circling the Sun

atmosphere Thick layer of gases that surround Earth and protect the planet from the Sun's rays

atoll Ring of coral reef surrounding a lagoon

biofuel A fuel produced from biomass

biomass Materials made from living organisms, such as animals and plants

carbon dioxide A colourless gas which is present in our atmosphere and is absorbed by plants. It is also released by burning fossil fuels. Its chemical symbol is CO₂

carbon footprint The amount of carbon dioxide a person's activities releases into the atmosphere

CFCs Gases that were used in refrigerators and aerosols. They caused damage to Earth's ozone layer but have since been banned

climate The weather conditions in a certain area over a long period of time

deforestation The cutting down of trees to make land available, resulting in the destruction of forests

ecosystem A community of living things which interact with each other in their environment

enhanced greenhouse effect The heating up of Earth as a result of increased greenhouse gas levels, due to human activity. Also known as climate change

energy What makes things happen. It is found in different forms, including heat, light, movement, sound, and electricity

erosion Breaking down of rock by water or weather

extinction When there are no more of a particular animal or plant species left alive anywhere in the world

fossil fuel Fuels formed by the decomposition of buried organisms. Oil, gas, and coal are fossil fuels. They contain large amounts of carbon and release carbon dioxide when burned for energy

fracking Forcing liquid at a very high pressure into the ground to extract oil or gas

global warming An increase in global temperature caused by the enhanced greenhouse effect

greenhouse effect The natural process in which gases in Earth's atmosphere trap the Sun's heat

greenhouse gas A gas in the Earth's atmosphere which absorbs the Sun's heat. Carbon dioxide, methane, nitrous oxide, and water vapour are greenhouse gases

habitat The natural home of an animal or plant

Industrial Revolution The beginning of an era in which

machinery, powered by fossil fuels, was used to make and transport things

infrastructure Permanent things, such as buildings, roads, and power supplies, that are needed for day-to-day activities

meltwater Water released by the melting of snow and ice, including from glaciers, sea ice, or ice shelves

meteorite A piece of solid rock that has fallen to Earth from outer space

methane A gas with no colour or smell, often used as fuel. It is a powerful greenhouse gas that is produced by cattle, burning fossil fuels, or when organic matter decomposes

microclimate The climate of a small area. It may be different from the climate of the surrounding area

migration The movement of people or animals from one place to another

mitigation The action of reducing the impact of something

non-renewable energy Energy that comes from

sources that will run out or will not be replaced in our lifetime

oxygen A gas that is vital for life to exist on Earth

ozone A form of oxygen which creates a layer around Earth, called the ozone layer, and protects Earth from the Sun's rays. Ozone is pale blue in colour

Pangea A supercontinent formed of all Earth's land masses. It existed 335 million years ago, but broke apart to form the continents we know today

peaceful protest The act of expressing views and campaigning for change without using violence

pollutant A substance that pollutes the atmosphere or water

pollution The introduction of harmful materials into the environment

protest An action expressing an objection to something

reforestation Replanting an area with trees

renewable energy Energy produced from a source that

is naturally replenished and will not run out, such as wind, solar, tidal, or geothermal energy

sea level The average height of the sea when it meets land

single-use Something that is used only once and then thrown away or destroyed.

stratosphere A layer of Earth's atmosphere. The ozone layer can be found in the stratosphere

strike A refusal to work or attend school as a form of protest

sustainability Meeting the needs of people today, without damaging the ability of future generations to meet their needs

turbine A machine in which a wheel fitted with blades is made to turn by the flow of liquid or gas. This turning motion produces energy

ultraviolet radiation A form of energy that travels in the Sun's rays. Too much exposure can cause sunburn

zero-waste Preventing any waste from being sent to landfill or from polluting the environment



Index

A

activists 44–47, 59
aerosol sprays 15
air pollution 17
air travel 16, 17
algae 32, 33
algae fuel 17
altitude 4, 38
Amazon rainforest 20, 58
Amazon Watch 49
animals 24–25, 27, 38–39
Antarctica 14, 24, 58
Arctic 24–25
atmosphere 6, 8–9, 14, 27
Australia 5, 30–31

B

Bangladesh 31, 41
biofuels 17
biomass energy 51
birds 29, 38, 39
bleaching, coral 32–33
blizzards 34

C

carbon dioxide 9, 13, 16, 17,
20, 27, 42, 54, 55, 58
carbon footprint 42–43, 57
carrots 37
cattle 20, 22, 59
CFC gases 15
climate 4–5
clothes 18, 19, 56
coal 10, 11, 12
coastal erosion 30, 41, 54
coastal regions 28, 30–31
composting 37
coral 28, 29, 32–33

crops 20, 22
currents, ocean 27

D

deforestation 6, 9, 20–21,
22, 54
deserts 5
DiCaprio, Leonardo 44
dinosaurs 6–7
droughts 34, 35, 54, 55

E

earthquakes 11
ecological footprint 43
ecosystems 18
electric vehicles 16, 17
electricity 42, 50–51, 56
emissions 6, 17, 22, 43, 53,
56, 57
energy 8–9, 50–51, 56
environment 10, 11, 17, 18,
19, 21, 22, 23, 37, 50
environmental activists 44–45
environmental organisations
48–49

equator 4
extinction 7, 38–39, 48
Extinction Rebellion 48
extreme weather events 9, 25,
27, 28, 31, 34–35, 40, 41

F

factories 13, 18, 54
fashion 18
floods 11, 21, 25, 28–29, 31,
33, 34, 35, 40, 41
food miles 17, 42
food packaging 18

food waste 19, 23
foodprint 22–23
forests 20, 59
fossil fuels 6, 9, 10–11, 12,
13, 16, 50, 55
fracking 11
Fraser-McDonald, Alice 52–53
#FridaysForFuture 46, 47
Friends of the Earth 48

G

geothermal energy 51
glaciers 24, 26, 40
Global Climate Strike 46, 47
global warming 9, 24–25,
26, 28
Great Barrier Reef 32
Great Dying 7
Green New Deal 45
greenhouse effect 8–9
greenhouse gases 6, 9, 12, 18,
22, 52–53
Greenpeace 49

H

habitat loss 9, 20, 24, 25, 27,
32–33, 38
hailstorms 34
harvesting 37
heat waves 34
human activity 6, 9
hurricanes 27
hydro energy 50

I

ice 24–25, 26, 27, 58
ice ages 6–7
Industrial Revolution 12–13

insects, edible 23
islands, sinking 28–29

J

Johnson, Bea 19

L

lakes 6, 41
landfill 18, 19, 52
livestock 20, 22, 59
logging 21

M

Ma Jun 45
mass extinctions 7
meat-free diet 23, 43
meltwater 26, 40
methane 9, 19, 22, 25, 53,
55, 59
microclimates 4, 5
migration 40–41, 59
mining 11
Monbiot, George 44
Montreal Protocol 15
mountains 4, 38

N

natural gas 10
natural resources 18, 43, 50
nitrous oxide 9, 22

O

Ocean Conservancy 49
oceans 27, 30, 58
oil rigs 10
oxygen 14, 58
ozone layer 14–15

P

Pangea 6–7
Paris Agreement 54, 59
plastic 18, 19, 56

polar ice caps 4, 24–25
pollution 10, 13, 16, 17, 21,
22, 36, 45, 54

R

radishes 37
rainfall 4, 5, 6
recycling 19
reforestation 21, 55
refrigerators 15
refugees 41
renewable energy 17, 50–51, 59
rice 22
river erosion 31
road transport 16–17

S

Sand Engine 31
school strikes 46–47
sea ice 24, 25, 27
sea levels 4, 9, 25, 26–27, 28–29,
30–31, 38, 40, 41, 54
sea life 27, 32–33
sea turtles 28, 39
seeds 36
Shiva, Vandana 45
Sierra Club 49
smoke 6, 13
snow 4, 24–25
soil erosion 21
solar energy 50, 55
Solomon Islands 29, 41
steam engines 13
storms 30, 31, 34, 35
stratosphere 14
Sun's rays 4, 8, 9, 15
sustainability 17, 19, 43

T

temperatures 4, 6, 9, 24, 26,
28, 38, 40, 41, 58
thermal expansion 26

throwaway culture 18, 57
Thunberg, Greta 44–45, 46
tidal energy 51
tomatoes 36–37
train travel 16, 17
transplanting 36
transport 10, 13, 16–17, 43
tropical cyclones 27
tropical storms 35
typhoons 41

U

ultraviolet radiation 14

V

vegetables, growing 36–37
volcanic eruptions 6–7
Vulcanol 59

W

waste disposal 19
water pollution 11, 18, 21, 22
water vapour 9
wave power 51
weather 4, 9, 25, 27, 28, 31,
34–35, 40, 41
wildfires 40, 55
wind 5
wind energy 50
World Wildlife Fund 48

Y

#YouthStrike4Climate 47

Z

zero-waste living 19



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findout! quiz

Test your knowledge about events, people, animals, and places that are all linked to Climate Change.



1

In which century did the Industrial Revolution begin?

2

True or false? The Seychelles is not sinking.



4

How does air drying your laundry help the climate?

3

Who is Greta Thunberg?

6

When was the Paris Agreement created?

5

How much land on Earth is covered by forests?



7

What is zero-waste living?



10

True or false? A single cow can produce up to 200 litres (53 gallons) of methane per year.

8

Which insect is 64 per cent protein?

9

What does UNHCR stand for?

Turn over to discover the answers

Quiz answers

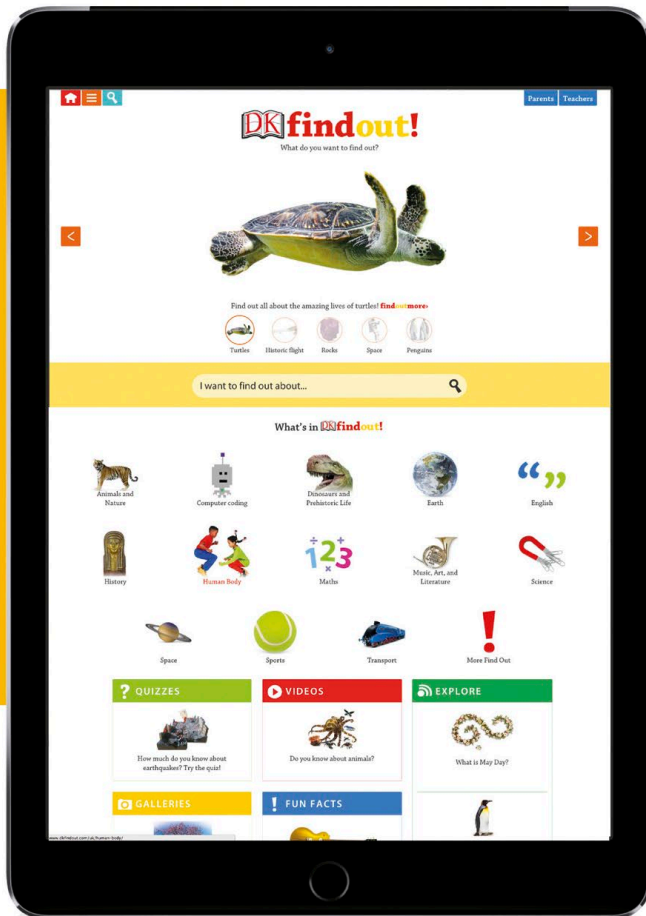


- 1** **The Industrial Revolution started in the 18th century.** Read more on pages 12–13.
- 2** **False.** Sadly, it is sinking because the sea is rising above the low-lying land. Turn to page 29 to find out more.
- 3** **Greta Thunberg is a Swedish school girl who has been protesting about climate change since 2018.** Turn to pages 44, 45, and 46 to read more about her.
- 4** **Drying washed clothes in the Sun helps save energy.** Read more about what you can do to help the climate on pages 56–57.
- 5** **30 per cent of land on Earth is covered by forests.** Read about the damaging effects of deforestation on pages 20–21.
- 6** **The Paris Agreement was ready to be signed in 2015. It was the first global deal to fight the climate crisis.** Find out more on page 54.
- 7** **Zero-waste living is a way of life where someone tries to reduce what they consume.** Read more about it on page 19.
- 8** **Crickets.** Turn to page 23 to find out more about what we'll be eating in the future.
- 9** **United Nations High Commissioner for Refugees.** Turn to page 41 to find out more.
- 10** **True.** Turn to page 22 to find out more.



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“This is pretty awesome.”

Primary school pupil, aged 9

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