



OUR SEAS

Whether our homes are near or far from the sea, our lives depend on our planet's oceans. Covering about 70% of the earth's surface, our seas supply half the oxygen we breathe, and provide food and livelihoods for more than a billion people.

They are also home to a wondrous array of wild species, from tiny plankton to the biggest creature that's ever existed – the blue whale. There are known to be more than 260,000 different species living in the seas, and we know that there are many yet to be discovered. Some scientists believe there are more than a million species in the seas, though human activity is driving some to extinction before we have had a chance to study them.

those that were food for that species, since predators stop populations from getting too big and using up all of the resources. Food chains can be delicate and complex!

Fishing provides the main income for over 200 million people, so it's really important to humans that these coastal seas are supported to be healthy habitats in which fish can live and breed now and forever.

COASTAL SEAS

Although they make up only 10 per cent of the ocean, these shallow waters of coastal seas (within 230 km of land) are home to 90 per cent of all marine species. Here sunlight reaches the sea floor, so plants can grow. These provide food for animals, protection from predators and a safe place for animals to breed and raise young. The coastal seas are made up of many different ecosystems including coral reefs, river estuaries, rock pools, salt marshes, mangrove forests and fields of underwater sea grasses.

Every species in a coastal sea community is important to the rest. If one is taken away, it can cause big problems for the other species that needed them for food – and even for

Pacific Herring move into shallow waters in spring to spawn. Allowing fish to safely breed and grow in our coastal seas would help increase fish populations throughout the ocean.



HIGH SEAS

Beyond the beaches and shallow coastal waters lie the high seas which cover more than 60 per cent of our planet's surface. This is by far the largest habitat on our planet, but also one of the least understood.

On average our oceans are 2.5 miles deep, and parts of the high seas are nearly 7 miles deep, forming the largest space for life on the planet. At present we have explored only 5% of the world's oceans.

PHYTOPLANKTON: TINY LIFE SAVERS

An expanse of seemingly empty ocean may contain much more life than it appears to the naked eye.

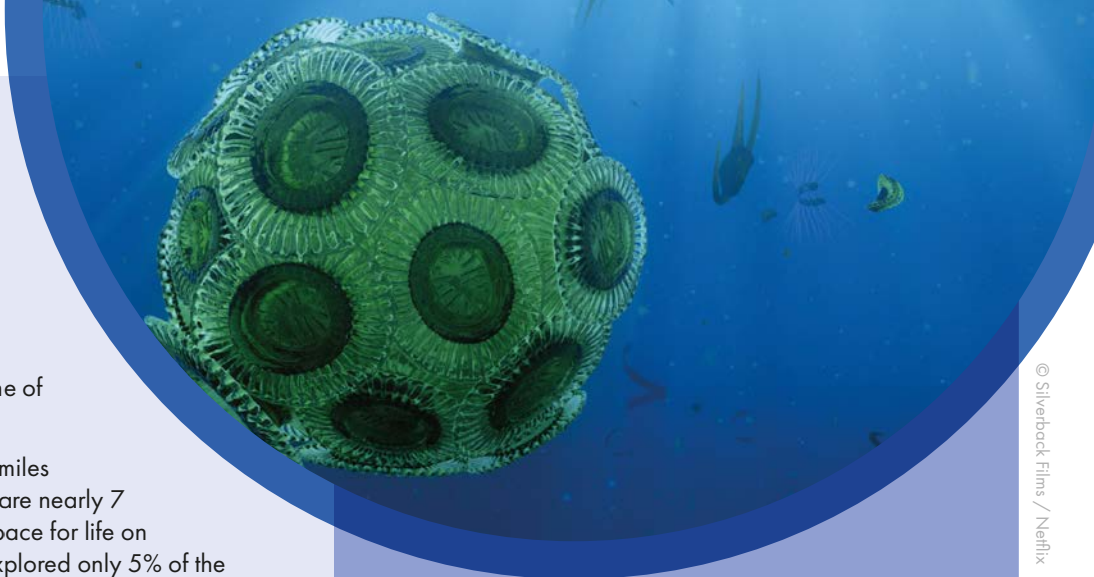
Phytoplankton are microscopic floating algae which drift on the ocean currents. Phytoplankton convert CO₂ to Oxygen and protect themselves from harmful UV rays by releasing a chemical that causes clouds to form overhead. These clouds play a role in slowing global warming by reflecting sunlight back into space. This role forming clouds mean that the oceans also drive weather systems that sustain life in other parts of the world.

As well as doing this amazing job, phytoplankton are food for **zooplankton** (simple water-dwelling creatures), such as **krill**, which are the most numerous animals on earth. These in turn provide food for many sea creatures including the biggest animal that has ever lived on earth – the **blue whale**.

THE MYSTERIOUS DEPTHS

We used to believe that very little lived in the cold, dark depths of the ocean. The more we explore, the more we realise that there is actually a lot of life down there – though not as we know it! Strange creatures roam, adapted to the pressure of the deep ocean, and often creating their own lights to lure prey. We have even found that coral reefs are not restricted to shallow coastal waters.

Much deep-sea life depends on 'marine snow' consisting of the remains of dead creatures and the poo of living ones which drifts down from the more heavily populated surface waters. In the total darkness of the deep ocean floor volcanic vents release super-hot, mineral rich water. Around these vents a huge abundance of life thrives. Strange creatures survive here by feeding on bacteria that get their energy from the chemicals flowing from the vents. We only found out that these unique habitats existed about 50 years ago, and there may be many more across the ocean floor.



Phytoplankton support the entire food chain of the open ocean, and produce half the oxygen in the air we breathe. No matter how far from the ocean you live you can thank these little plants for every other breath you take.

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WHAT'S THE PROBLEM?

Despite the vastness of the oceans, human activity is devastating ocean ecosystems. **Illegal fishing** and **overfishing** means that fish can't build up their numbers and whole populations are being wiped out, causing problems to the whole community of creatures and plants in that ecosystem, and the humans who depend on them for a living.

Noise from human activities cause problems for ocean wildlife too. The noise from a ship's propeller can travel 100km through water, and can disturb fish and stop them communicating and breeding. Noise from mining can cause problems in the same way, as well as destroying habitat and risking pollution that can kill wildlife. Scientists and conservationists now argue for 30 per cent of the high seas to be protected from fishing and mining through 'Marine Protected Areas' which all countries agree to leave alone as spaces for nature.

The effects of human activity are felt in the remotest parts of the high seas. Every year almost 9 million tons of plastic enters the ocean. That's the same as a rubbish truck emptying its load every minute. In the middle of the Pacific a huge area of plastic rubbish, twice the size of France, is kept in place by the swirling currents. Plastic chokes the

oceans and harms marine life. Blue whales have been washed up dead on seashores with pieces of plastic in their stomachs which they probably mistook for squid.

Climate change is also harming ocean life. Warmer water can absorb more CO₂ from the air, and this makes the ocean more acidic than before. This means the conditions are changing from those in which sea creatures evolved, and in some cases it stops them from being able to build their shells or exoskeletons.

There is much that needs doing in the oceans. We need to act. The quicker we act, the better the chance that damaged marine ecosystems – the fish we catch for food, the cold-water corals and hydrothermal vents, the vast pods of whales and mysterious deep-sea creatures – will recover fully. The result will be a healthy ocean that provides food and jobs for people as well as homes and food for wildlife well into the future.

WHAT CAN WE DO?

We can keep enjoying the riches of the oceans, but only if we look after them and don't take too much from them. One way to protect the future of the oceans is for countries to create **Marine Protected Areas (MPAs)** in their coastal waters where no fishing is allowed. These safe spaces will mean that there are always places for fish to grow big and reproduce, and as well as ensuring that fish species don't die out this will mean we'll actually catch more fish than we do at the moment. The seas will recover, there'll be more fish in the sea, and we'll catch more too – it's win-win all round!

When seas are within the border of a country, that country can set rules on who can use the waters for fishing, mining and transport of goods in ships, and how much they are

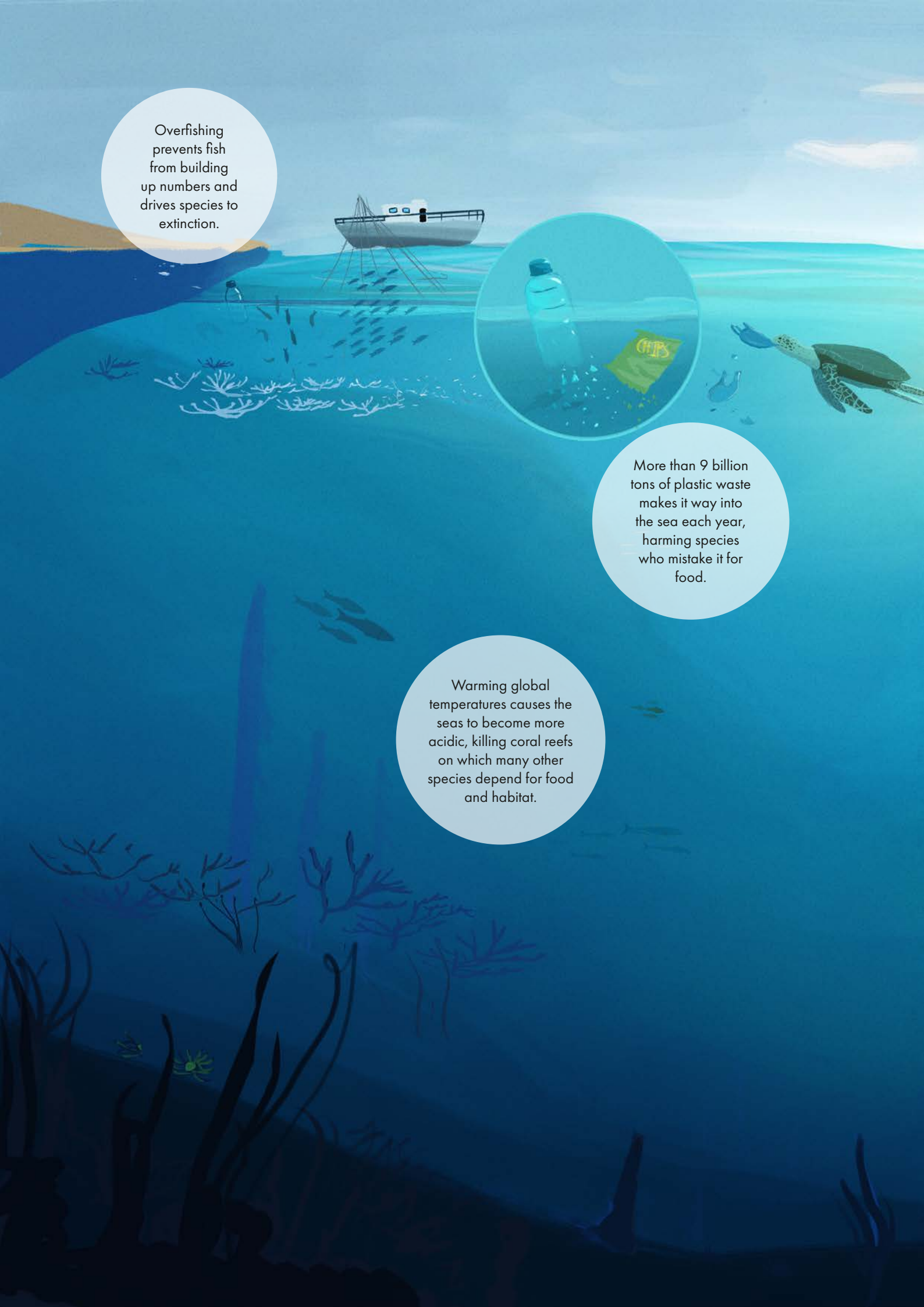
allowed to do these things. The high seas are international waters, owned by no one, and therefore open for anyone to use as they want. This means that they are also the least protected waters, open to damage by over-fishing, mining, shipping and pollution. **Less than 2% of the world's international waters have any form of protection.** In the past – when there were fewer humans on the planet – fish populations seemed limitless and oceans too big to pollute, but with human impacts now extending to the most remote and deepest parts of the oceans, action is needed to stop the damage before it is too late. If we want to keep our oceans healthy, we need an **international treaty** to protect them for generations to come.

The choices we make when buying seafood can help ensure a good future for our oceans and seas – and for us! Check labels for information about how fish or shellfish was caught or farmed, and try to avoid species that are known to be in trouble. You can find a local sustainable seafood guide to help you decide what it is OK to eat.

Good	Bad
From a sustainable fishery (eg MSC certified)	No accreditation – could be from over-fished waters
Line Caught	Trawled / long line / gill net
Locally sourced	Imported from other countries
Hand gathered shellfish	Dredged shellfish
Organically farmed	Intensively farmed



Whales and other big sea creatures help sustain phytoplankton and therefore all life in the ocean by fertilising the surface waters with their poo, and by mixing air into the water when they break the surface.

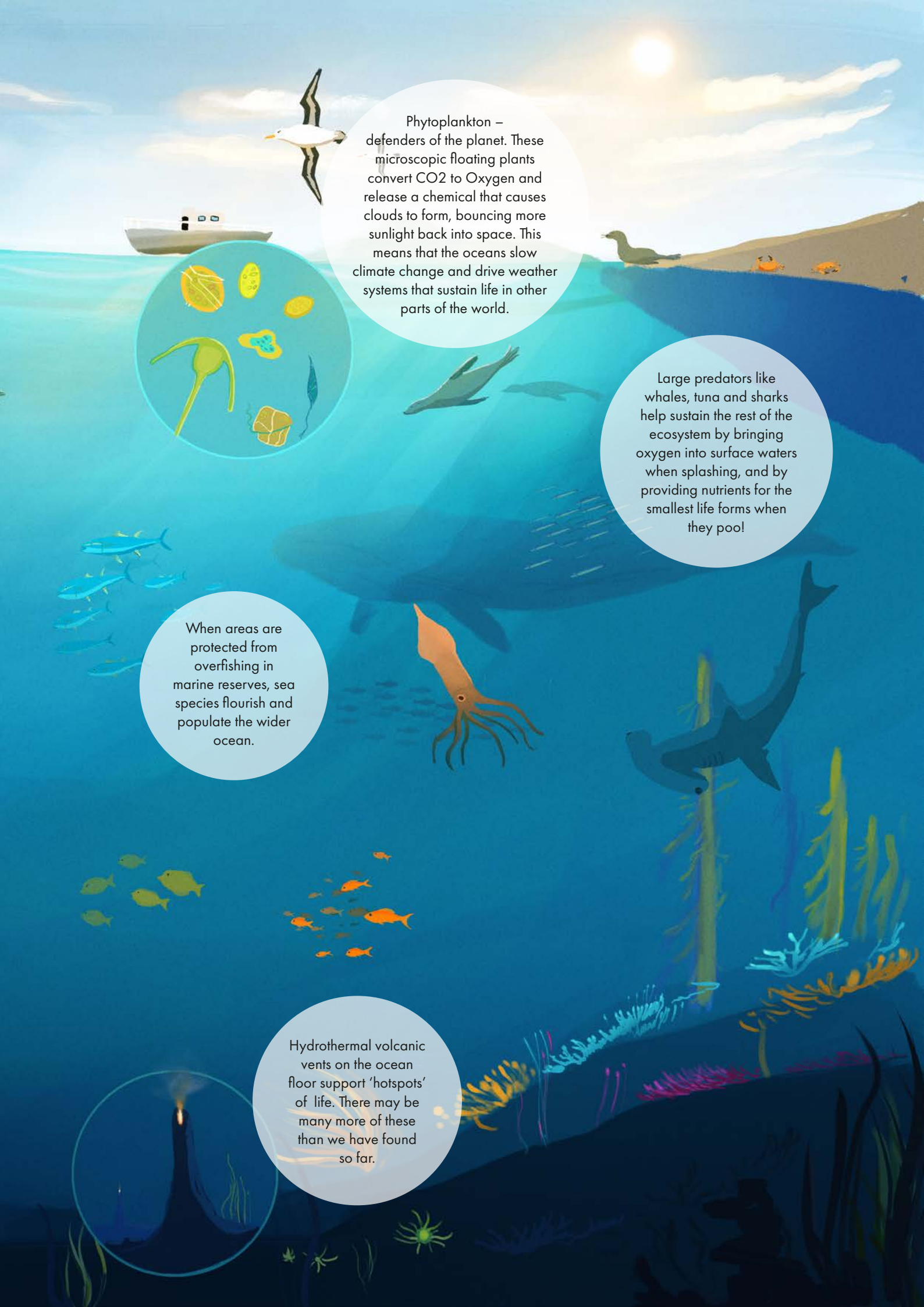


Overfishing prevents fish from building up numbers and drives species to extinction.



More than 9 billion tons of plastic waste makes it way into the sea each year, harming species who mistake it for food.

Warming global temperatures causes the seas to become more acidic, killing coral reefs on which many other species depend for food and habitat.



Phytoplankton – defenders of the planet. These microscopic floating plants convert CO₂ to Oxygen and release a chemical that causes clouds to form, bouncing more sunlight back into space. This means that the oceans slow climate change and drive weather systems that sustain life in other parts of the world.

Large predators like whales, tuna and sharks help sustain the rest of the ecosystem by bringing oxygen into surface waters when splashing, and by providing nutrients for the smallest life forms when they poo!

When areas are protected from overfishing in marine reserves, sea species flourish and populate the wider ocean.

Hydrothermal volcanic vents on the ocean floor support 'hotspots' of life. There may be many more of these than we have found so far.

THE GREAT BARRIER REEF

Coral reefs have been called the rainforests of the ocean because they are so rich in biodiversity. They are home to a quarter of all marine life. The largest coral reef system on our planet is the Great Barrier Reef in Australia. It stretches for more than 2000 km and can even be seen from space. This system of reefs and islands provides refuge to an amazing variety of marine plants and animals. It is home to more than 3000 types of shell and over 1600 fish species, as well as over 600 different corals.

The Great Barrier Reef has built up over millions of years, but today its future is at risk, and this is due to human activity. Pollution and overfishing have affected the delicate balance of the environment. As we burn fossil fuels the water temperatures are rising and the seas are becoming more acidic. This causes corals to bleach and die. In 2016 more than half the corals in some parts of the northern Great Barrier Reef turned white through coral bleaching. Globally, over the last thirty years the world has lost half of its coral.

The Great Barrier Reef is one of the world's most popular tourist attractions. It brings in well over US\$5.7 billion per year. But its value goes beyond that. A world without coral reefs would be a much poorer place for us all. We can take steps to stop climate change and protect the natural wonders of our coral reefs.



FACILITATOR INSTRUCTIONS

KEY MESSAGES

PROBLEMS FACING OCEANS

- Overfishing of coastal waters, preventing fish populations from recovering what is taken out
- Lack of ownership of high seas leading to lack of protection from over-fishing, mining and shipping
- Noise pollution from ship propellers and drilling for oil and gas disrupting wildlife
- Plastic pollution making it into the oceans
- Rising temperatures and CO2 levels causing changes to the ecosystem damaging some wildlife – eg bleaching coral

SOLUTIONS

- International treaty protecting high seas from over-fishing and mining
- Marine Protected Areas (no fishing, mining or shipping) in coastal waters allowing space for fish stocks to recover and repopulate the ocean
- Reduced plastic use and recycling of whatever we do use
- Reduced use of fossil fuels to slow global warming

SDGs LINKS

Goal 14: Conserve and sustainably use the oceans, seas and marine resources

<https://www.un.org/sustainabledevelopment/oceans/>

Ensuring a healthy and productive future for our oceans also contributes to other SDG goals, including the following:

GOAL 1: No Poverty

GOAL 2: Zero Hunger

GOAL 3: Good Health and Well-being

GOAL 8: Decent Work and Economic Growth

GOAL 12: Responsible Consumption and Production

GOAL 13: Climate Action



GUIDED DISCUSSION PROMPTS

Use these prompts to generate a class or small group discussion based on the Our Oceans briefing, or videos on ourplanet.com.

Can you describe the ocean that you have just seen?

What does it look like? What surprised you most?

Allow children to convey their sense of wonder at these underwater places that they will probably never have seen. To create a relaxed group setting, give children time to talk together in pairs, before sharing their thoughts with the whole group.

Which is your favourite sea creature and why?

What does the sea give us?

The sea gives us food, but it also provides us with water activities and beaches to play on. Millions of people depend on the sea to earn their living. Even if we don't live near the sea, it plays a big part in our lives.

Why do we need our oceans?

They provide us with food, they supply us with clean air to breathe, they soak up dangerous carbon dioxide in the earth's atmosphere and they help to regulate our climate.

What do you think is harming high seas and the wildlife that live there?

Over-fishing, mining, shipping, pollution

How can we look after the seas?

It is important to help children understand that we can all do something about the challenges that our planet faces. Reducing our carbon footprint and saving energy, is a small step that can make a big difference. We can also make sure we eat fish with an MSC label, keep beaches clean, use less plastic, and support organisations that are working to protect the seas.

Imagine it is 2030 (12 years time). What do you hope oceans would be like? What would you want to be different about how we treat them?

Lots of fish, big variety of different marine creatures, clean, areas with no fishing (MPAs), lots of fish being caught to eat – but enough left behind to keep the population healthy.

Why are Marine Protected Areas (MPAs) important?

MPAs provide safe areas where animals and plants are protected so that the oceans can be replenished.

Why is no one stopping these things happening?

International waters belong to no country so no one has responsibility to protect.

What do you think could be done to make things better?

International treaties on use of the high seas, including protected areas (MPAs).

Useful Links

Explanation of the three principles of sustainable fisheries:

<https://20.msc.org/what-we-are-doing/our-approach/what-is-sustainable-fishing>

More resources on sustainable fishing and MPAs can be found on the MSC website – including films and worksheets:

<https://fishandkids.msc.org/en/teachers/whole-school-resources/marine-sustainability>

ACTIVITIES

ACTIVITY IDEA	SUGGESTED AGE	SUBJECTS
Work collaboratively to create a sea mural.	6 – 8	Art Geography
Design a poster or storyboard a TV campaign aimed at persuading people to buy responsibly sourced seafood.	7 – 14	Art Literacy Citizenship
In groups, make a board game based on the environmental issues faced by the coastal seas.	7 – 14	Art & Design Literacy Geography
We are still discovering new species in the deep sea. Research real recent discoveries. Imagine and draw a creature that you might discover. What are its characteristics and why has it evolved in that way? Remember to give it a name!	7 – 11	Art Science
Imagine you are world leaders, and work together to come up with an agreement about how you will work together to look after the oceans. Remember – you still want to be able to benefit from the sea, but you need to ensure that those benefits are still available in the years to come. When you have come up with your treaty, hold a press conference to answer questions from other groups.	11 – 14	Citizenship Geography Drama



OUR FROZEN WORLDS

Our life on earth depends on the coldest places on our planet – the icy worlds of the Arctic and Antarctica.

The Arctic region is the northernmost region of the planet, consisting of the Arctic Ocean and parts of Russia, Greenland, Canada, USA, Norway, Iceland, Sweden and Finland that lie above the 'Arctic Circle'. This is an imaginary line around the top of the globe. About 4 Million people live in the Arctic region, and the Arctic sea ice supports a wide range of animal species from microscopic algae to the world's largest land carnivore, the polar bear.

At the other end of the earth, **the Antarctic** is the world's highest, driest, windiest and coldest continent. It is bigger than Europe and is so dry that it's actually classed as a desert. The freezing Southern Ocean surrounding Antarctica is teeming with life. The waters are full of nutrients which feed plankton at the bottom of the food chain. This is a vital source of food for krill, tiny shrimp-like creatures which are then eaten by seals, penguins, seabirds and whales.

WHY DOES ICE MATTER?

The ice provides a platform on which much life in the polar regions depends. Polar bears need the sea ice to hunt for seals. If the ice connected to land forms later and melts earlier in the year, the bears have less time to hunt and it becomes harder for females to build up the fat stores that they need to nurse their cubs. Walruses can't climb out of the sea onto thin ice, and caribou risk falling


through it as they cross between islands or headlands. In the Antarctic, krill need sea ice under which to feed and nurture their young. Penguins, which eat krill and small fish are a vital source of food for predators such as leopard seals and killer whales.

Gentoo penguins in Antarctica live mainly on crustaceans, such as krill. Krill depend on the shelter and algae food source provided by sea ice to survive their first year of life.



OUR PLANET
NETFLIX





Almost all humpback whales in the Southern Hemisphere come to the Antarctic to feed on krill. Since the ban on commercial whaling, their numbers have recovered dramatically, but their food supply is now under threat.

Every one of us needs the ice in these frozen worlds. That's because it reflects the rays of the sun back into space and this keeps our planet cool. The polar regions act as a giant air conditioner, helping to protect us from the effects of climate change.

SO, WHAT'S THE PROBLEM?

Globally, sea ice is diminishing faster than ever before. Some regions are losing sea ice faster than others, with terrible consequences for wildlife in those areas. We are burning fossil fuels such as coal, oil, and natural gas which releases carbon dioxide into the earth's atmosphere. This causes global warming and melting ice. At a local level cars that use petrol or diesel add to the problem, while also making the air we breathe dirty so that more people get asthma as a child, and people die earlier because of problems caused by air pollution.

Melting ice causes lots of problems that affect everyone on the planet – not just the animals who need the ice to hunt, breed and sleep. Loss of ice from the poles is causing weather systems to change because the Arctic and parts of Antarctica are warming faster than the rest of our planet. We are already seeing more droughts and flooding around the world. Also, when ice melts it will cause sea levels to rise so that millions of people and lots of wildlife could see their homes disappear below the waves.

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WHAT CAN WE DO?

The future of our planet is in our hands. We have the technology to use energy that comes from clean and renewable sources such as wind and solar power. If we stop burning fossil fuels it's better for our planet and better for us too. Using renewable energy is cheap, and it means we can breathe clean air which keeps us all healthier. Electric cars can reduce the use of petrol, which means cleaner air for us all to breathe. If the electricity is coming from clean renewable sources then the planet is benefiting too!

Ice in the polar regions reflects sunlight back into space and helps cool our planet.

Warmer Arctic temperatures weaken the polar jet stream, changing its shape and causing extreme weather further south.



Generating energy from renewable sources such as wind power allows us to use less fossil fuels and slow climate change.

Antarctic krill are a vital food source for ocean species worldwide, and depend on the shelter and food under sea ice to nurture their young.





The polar jet stream is a circle of fast-moving air currents created by the temperature difference between the cold Arctic and warmer areas further south.



Burning fossil fuels releases carbon into the atmosphere, causing global warming that leads to loss of sea ice.



As sea ice disappears predators such as walruses and polar bears have to swim long distances from land to find food.





MEET THE LOCALS: WALRUSES

Found in the freezing waters of the Arctic, walrus are huge mammals that grow to between 2.2 and 3.6 metres in length and weigh between 400 and 1,800 kg – about the same as a family car. Their main diet is clams, though they can feed on many other marine animals, including sea cucumbers, coral, shrimp, crabs, seals, sea birds and even whales. To find clams, walrus dive to shallow sea floors and search with their sensitive vibrissae (whiskers). They can dive to depths of over 90 metres, and stay underwater for more than 30 minutes at a time.

Both male and female walrus have large tusks, used for cutting through ice and getting out of the water, as well as defence. Tusks can be as long as 3 feet (0.9 m) for males! Walrus can withstand freezing temperatures as low as -35°C (-31°F) thanks to thick layers of blubber (fat) beneath their skin that help insulate them from the cold. They are also capable of slowing their heartbeat to endure the temperature, allowing them to live comfortably in the Arctic.

Walrus herd together on ice floes in herds of several hundred, but in mating season there can be thousands in one massive herd. The sea ice is vital to walrus because it provides a platform from which they can dive into the sea

to search for clams and mussels on the ocean bed, and a place to rest between dives without having to go far from the food source. The ice also allows life to thrive in the ocean because it supports the growth of algae which provides food for other wildlife and therefore food for walrus.

As the Arctic warms, ice is disappearing and walrus in the far north are having to herd together on coastlines further south than their usual hunting grounds. Huge numbers of walrus depend on limited land and resources, causing stressful conditions that many walrus do not survive.



FACILITATOR INSTRUCTIONS

KEY MESSAGES

PROBLEMS FACING OUR FROZEN WORLDS

- Global warming caused by fossil fuels
- Loss of sea ice reducing space for species to hunt, sleep and breed
- Loss of sea ice reduces krill populations, meaning less food for many other species

SOLUTIONS

- Replacing fossil fuels with renewable energy to slow global warming

SDGs LINKS

Goal 7: Ensure access to affordable, reliable, sustainable and modern energy

<https://www.un.org/sustainabledevelopment/energy/>

Goal 13: Take urgent action to combat climate change and its impacts

<https://www.un.org/sustainabledevelopment/climate-change-2/>

Goal 14: Conserve and sustainably use the oceans, seas and marine resources

<https://www.un.org/sustainabledevelopment/oceans/>

Ensuring the future of our frozen worlds also contributes to other SDG goals, including the following:

GOAL 2: Zero Hunger

GOAL 12: Responsible Consumption and Production

GOAL 15: Life on Land



GUIDED DISCUSSION PROMPTS

Use these prompts to generate a class or small group discussion based on the Our Oceans briefing, or videos on ourplanet.com.

Can you describe the frozen worlds of the polar regions? What do the polar regions look like? What do they feel like?

Allow children to convey their sense of wonder at these places that they will never have seen.

What animals can you think of that live in these frozen landscapes? Which are the biggest animals? And which are the smallest?

The polar bear is the world's largest carnivorous land animal. Bowhead whales in the Arctic can grow to 18m in length while the Blue whale, which spends the warmer months in the Antarctic, can grow to over 33m in length. The smallest animals are microscopic plankton and krill, which are tiny, shrimp-like, animals.

Why are the smallest animals important? What would happen if these tiny creatures disappeared?

Through the food chains, the largest animals, depend on the smallest for their survival. The Bowhead whale needs to eat about 100 tonnes of tiny zooplankton every year.

Can you think of one important change that is taking place to these ice worlds?

Global warming means that the earth's climate is changing and the ice in the frozen worlds is melting.

Why does this change matter?

Melting ice means that the future of animals and people living in the polar regions is under threat. As a result of the ice melting global warming is accelerating. This means that there are more extreme weather events, more species are threatened, and sea levels are rising.

Some species rely on the ice – eg walrus and polar bears who hunt from sea ice.

What can we do about it?

Using less energy. Using renewable power such as hydro-electric, wind or solar instead of fossil fuels (locally through solar panels etc, and for power stations).

Imagine it is 2030 (12 years time). What would you like the world to be like? What is different at the poles, and what is a city of the future like? How are they connected?

ACTIVITIES

ACTIVITY IDEA	SUGGESTED AGE	SUBJECTS
Separate into groups, each focused on a different animal that lives in the Arctic or Antarctic (seal, polar bear, walrus, penguin, krill, narwhal, arctic tern etc). Think about what the creature looks like and discuss/research how it has evolved to survive in the frozen world. Consider how it will be affected if temperatures rise and ice melts.	7 – 14	Geography Science
Ask the young people to write a story in the first person from the perspective of a polar animal, experiencing the effects of climate change. What challenges do they face? How does it make them feel?	6 – 11	Literacy Geography
Working in small groups, ask the young people to map out a typical day (as a diary or as a picture storyboard). They should highlight every time an activity uses energy or contributes to global warming, and consider what they, their parents or their school could do differently to reduce impact. Groups report back and compile a list of all the things that could be changed for the better on the board. Discuss if any of these could actually be achieved, and who would have to make those changes. Write letters or design posters to try and persuade the people who need to do things differently to act.	7 – 14	Geography Citizenship Art & Design
Ask the young people to work in small groups to plan a polar expedition. What would they need to take? How would they get there? What dangers would they face and how would they deal with them?	7 – 14	Geography Literacy
Show the image of the polar bears and penguins on the sea ice (below). Animals can't speak, but ask the young people to imagine that these animals could send a message to all of us? What would that message would be?	6 – 11	Literacy



OUR FRESHWATER

All life on earth depends on freshwater, yet less than 3 per cent of the water on our planet is fresh. The rest of the water on our planet is salty seawater in the oceans.

Almost all freshwater is locked up in ice caps or glaciers or buried deep underground. We are able to use less than one per cent of freshwater as it flows through rivers and streams, ponds, lakes and wetlands.

Freshwater is our planet's most precious resource. We drink it to stay alive, use it to stay clean and water the crops that we eat. It is used in producing the cotton clothes we wear and, through hydropower and cooling water in thermal power stations, it produces the electricity that lights our homes.

Freshwater is essential for nature too. Freshwater habitats are home to more than 10 per cent of all known animals and almost half of all known fish species. Freshwater ecosystems help to regulate the temperature of the land and sea. They allow wildlife to travel vast distances through different kinds of landscape to complete their life cycles, and act as conveyor belts transporting nutrients that make soil good for growing food. The flow of clean freshwater through rivers, lakes and wetlands is very important to the survival of aquatic life. It needs to be **clean**, and it needs to be able to **flow** from place to place, rising and falling with the seasons.

WHAT'S THE PROBLEM?

Populations of freshwater species are falling faster than wildlife in any other type of habitat on our planet, and this means that many of the things we need from rivers, lakes and wetlands are also in danger of being lost.

When rivers and rainfall do not provide enough water for our needs we change the natural flow to get it. Today we are using too much water, in too many places.

Florida Manatees leave coastal seas to swim up rivers in Winter to find warmer water and abundant freshwater plants to eat. Humans are now taking so much water from springs, and polluting others, that manatees are losing their winter homes.



OUR PLANET
NETFLIX





A male *Callipterus* cichlid in the African Lake Tanganyika collects empty shells to attract females, who need shells in which to breed.



Sandhill cranes stop on their annual migration at the Platte River in Nebraska, North America. Humans have dammed the river, and taken so much of its water, that there is little space left for the cranes. Conservationists now manage the river's flow to create the sandbanks the cranes need.

In some cases we do this by pumping water up directly from rivers or from below the ground, and end up taking more than rainwater can replace. This means there is less and less water flowing downstream or underground until eventually it dries up. People and animals who depend on that water face great problems.

We have built dams that stop the natural flow of freshwater so that we can collect water where we need it for large cities or for farming, or so we can generate hydropower as the water is released through the dam. Hydropower produces almost one-fifth of the world's electricity, but dams can hurt river environments. They stop freshwater fish being able to migrate upstream from the sea to spawn. This is a major reason why more than a third of the world's freshwater fish species are vulnerable to extinction. The dorado catfish migrates from the Amazon's delta to the Andean foothills – a journey of more than 3000 miles.

It's not just dams. Concrete is often used to strengthen and raise river banks to keep rivers from flooding. This means that land close to the river can be used to build houses or as farmland, when it was previously a floodplain. This destroys floodplain wetlands which filter pollution from water and provide homes for wildlife and places for fish to spawn (lay their eggs). This attempt to control the flow often ends up causing more problems with flooding than it solves. The man-made banks cause the increased flow of water to speed up in the river channel instead of losing energy by spreading out when it overflows the banks. River levels downstream rise much higher, much faster. As a result, the banks often break and the result is much worse floods than would have happened otherwise.


CREATING A WATER-SECURE FUTURE

We all share one planet and by thinking carefully, we can keep freshwater flowing. About 90 per cent of the water we use goes to water crops. But this can be done more efficiently. Used wisely, drip irrigation and other

technologies mean that far less water is used and there's no need to use energy to pump it. More can be grown on less land. If some of the water saved is returned to the river, animal and plant habitats are saved.

We all use water in our everyday life too, and there are things we can do at home to use less and allow more water to stay in the freshwater habitats where it is needed. We can use less water when washing, cooking, and flushing the toilet.

We can also remove or alter dams that cause problems by disrupting the flow of freshwater. And we can think more carefully about whether, and where, to build new ones. We should explore different ways to generate renewable electricity and collect water for drinking and irrigation without blocking entire rivers.



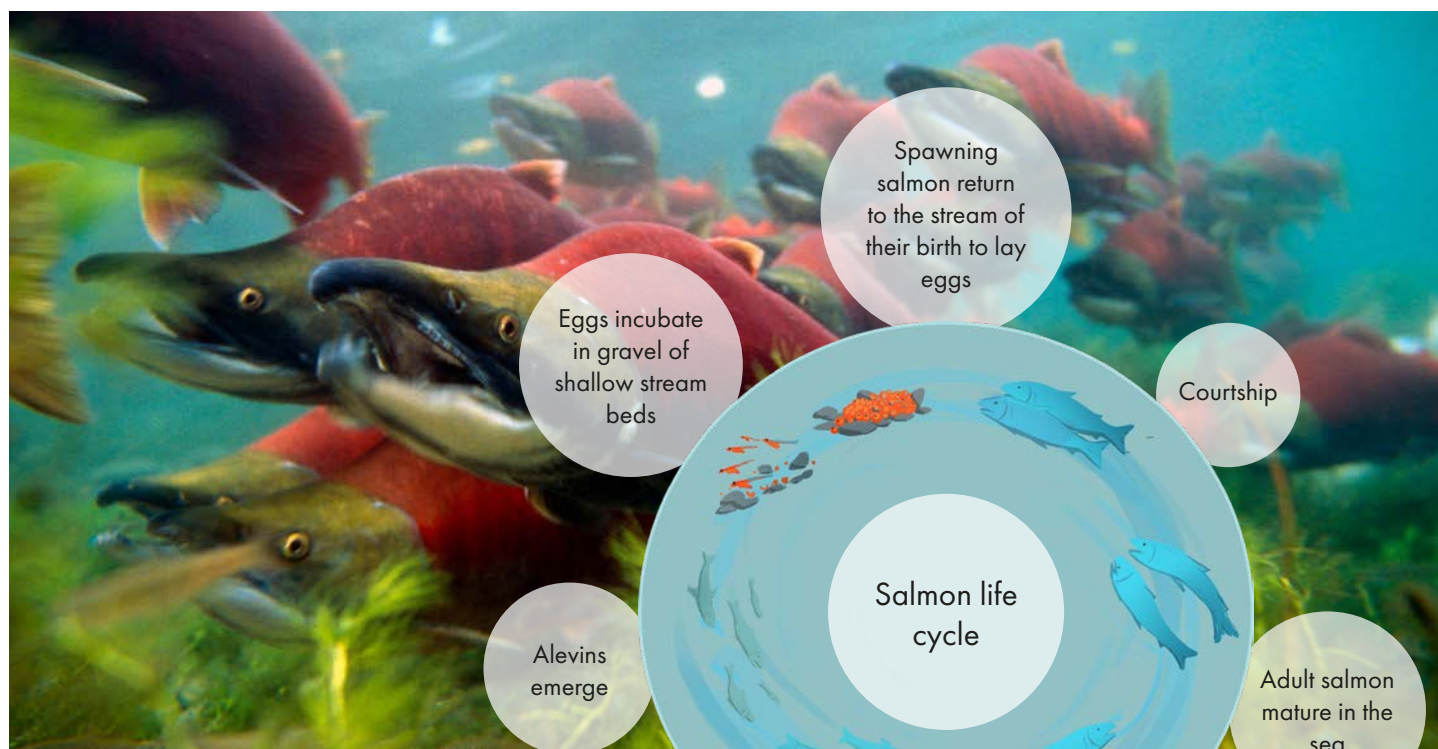
Dams block the flow of water, which prevents the transport of nutrients, sediments and wildlife.



Irrigation accounts for 90% of all the freshwater used by humans, but new farming methods can reduce this demand.

Cities can allow freshwater to flow naturally by including green spaces, permeable pavements and roof gardens.





MEET THE LOCALS: PACIFIC SALMON

Pacific salmon, as the name suggests, live for most of their life in the Pacific Ocean. They begin and end their life in fresh water, however, often traveling for thousands of kilometres in their lifetime and yet returning to the river of their birth. It's still a mystery exactly how salmon find their way home, but they seem to navigate by the stars, sense electromagnetic currents and use their strong sense of smell.

Salmon start out as fertilized eggs in gravel at the bottom of streams and lakes far from the sea. After hatching they swim downstream to the ocean where they live for many years, growing into large adults. Once fully developed their bodies change so that they can move from salt water to freshwater and they migrate upstream to reach the stream or lake in which they hatched. There they will spawn and lay eggs for the next generation.

When living in fresh water all salmon need a flow of clean, cool water. Both young and older salmon rely on streams and river features: pools and riffles. Pools are areas of a stream or river where the water is deep, slow moving, with silt or clay on the bottom. These allow salmon to hide from predators or relax in cooler water. Riffles are areas of a stream or river where the water is shallow and fast moving, with gravel or rocks on the bottom. Salmon rely on these for laying their eggs, and the flow adds oxygen to the water.

Unfortunately, when humans change the flow of a river by building dams, changing the course of a river or making it

run through concrete channels, the habitat is changed so that salmon find it harder to survive and to travel up and down stream to complete their life cycle.

Dams create barriers to young salmon migrating to the ocean, and for adult fish returning to spawn. They also affect the way water moves down a river, by changing the amount and timing of flow, and its temperature and chemical characteristics. Dams also change upstream habitat from a river into a lake, where salmon become easy for predators to catch. Some dams have 'fish ladders' to give a way for salmon and other migrating fish to pass, but even the best of these still let fewer salmon through, and don't help with the other changes that dams cause to the freshwater habitat.

Wild salmon is an important source of food and income for many people, and a vital part of the freshwater and ocean ecosystem. We risk losing them if we don't stop interfering with the natural flow of freshwater.



FACILITATOR INSTRUCTIONS

KEY MESSAGES

PROBLEMS FACING FRESHWATER

- **Dams** that affect flow further downstream and stop fish migrating to complete their life cycles
- **Using too much water** at home and for farming
- **Polluting waterways** (eg pesticides washing into rivers from farmland)

SOLUTIONS

- Design different kinds of dams that aren't located in rivers with high numbers of wildlife and which allow fish to pass freely and allow water to flow more naturally
- Find ways to use less water – share the same water between industries or waste less at home / on farms
- Prevent pollution from farms and settlements being washed into waterways

SDGs LINKS

Goal 6: Ensure access to water and sanitation for all

<https://www.un.org/sustainabledevelopment/water-and-sanitation/>

Goal 14: Conserve and sustainably use the oceans, seas and marine resources

<https://www.un.org/sustainabledevelopment/oceans/>

Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss

<https://www.un.org/sustainabledevelopment/biodiversity/>

Ensuring a healthy and productive future for our freshwater habitats also contributes to other SDG goals, including the following:

GOAL 1: No Poverty

GOAL 2: Zero Hunger

GOAL 3: Good Health and Well-being

GOAL 12: Responsible Consumption and Production



GUIDED DISCUSSION PROMPTS

Use these prompts to generate a class or small group discussion based on the Our Oceans briefing, or videos on ourplanet.com.

What is freshwater?

You may need to explain that the waters of the oceans are salty and so we can't use them in the same way.

Have you ever spent time by a river, stream or lake? What did you do? What was special about this place?

Allow children time to begin by discussing their own experiences.

What freshwater ecosystems can you think of?

Some are very well known, such as the Amazon river but be sure to mention local ponds and rivers.

What plants and animals can you think of that might live in these places or depend on freshwater habitats generally?

EG fish, shrimp, otters, beavers, kingfisher, herons, plants, algae, mayflies, river dolphins,

Why is freshwater important to us and our planet?

Flow – Carrying nutrients and water that plants and animals need to live.

Allowing wildlife to travel and complete their life cycle.

Fish for us to eat, water for us to grow crops and drink.

Why is freshwater important to us? Think of all the ways that you use water.

Encourage children to come up with as many ideas as they can including drinking, bathing, flushing toilets, washing up, cleaning, watering gardens and crops,

washing the car, for leisure activities such as canoeing, swimming or fishing and, indirectly, through any electricity we use.

What problems are affecting the flow of water?

Overuse of water by people and on farms. Dams that don't allow water to flow through carrying fish and nutrients to where they are needed. Farming and settlements causing pesticides to drain into freshwater habitats.

What could be done differently?

Fewer dams, or dams that allow water and fish to pass. Less water waste. Farming without pesticides and chemicals.

Can you think of what you can do to save water?

It is important that children feel empowered to do something themselves such as taking showers rather than baths, turning off the tap while brushing their teeth etc.

ACTIVITIES

ACTIVITY IDEA	SUGGESTED AGE	SUBJECTS
Young people keep a log of how much water they use in one day. Compare it with others and see if there are any ways in which they could save water. After a week, do the same thing and see who has lowered their water use by the most.	6 – 14	Citizenship
Carry out a pond dipping activity, and use the Our Planet citizen science app (Seek) or reference books to identify the range of wildlife and plants that live in the habitat. Consider what conditions they need to thrive and how the habitat provides these.	6 – 14	Science Geography
Recreate the salmon's journey upstream to spawn by setting up a salmon migration obstacle course https://www.scienceworld.ca/resources/activities/salmon-migration-obstacle-course . Afterwards, consider what humans could change to increase the number of salmon who make it upstream to spawn. How would that help people?	7 – 11	Geography Science
Create a mini landscape from soil in a tray and sow cress seeds over the whole surface. Raise one end by a few centimetres to create a slope and ensure drainage and a container to catch water at the other end. Pour a glass of water into a single point in the centre of the highest point of the tray and let it run down through the landscape creating a river system. Each day pour another glass of water into the same point. Observe where the cress grows and how this corresponds to the river system. After a while, place one or more dams (erasers or pieces of thick card) at key points in the river system, and halve the amount of water you add each day. See what effect this has on the landscape after a few more days of watering. Discuss how this reflects the real world, and what could be done about it.	6 – 11	Geography
Write and illustrate a first person story or diary from the perspective of a salmon, imagining the challenges and dangers they may face.	7 – 11	Literacy Geography Art
Create a freshwater mural or collage	6 – 7	Art



OUR GRASSLANDS

You may know them as prairies, steppes, meadows, savanna or pampas – grasslands cover over a quarter of the land on our planet.

The first peoples hunted across their vast spaces. Later they settled and began farming, turning grasslands into fields of corn, wheat or other crops. Grasslands are found on every continent except Antarctica. They are found where there is not enough regular rain for forests to grow. Instead these huge areas are covered in grasses which can keep on growing even after being chewed on by animals. When rain arrives, many grasslands are covered in flowers. They can even spring back to life after fires.

Grasslands also absorb carbon from the atmosphere and store it underground, helping to prevent global warming. The more different plant species there are in a grassland, the more efficient it is at absorbing CO₂.

THE GREAT EXPANSES

Across our planet, grasslands support huge numbers of grazing animals such as zebra, antelope and wildebeest. Many of these are constantly on the move following the rain that causes the grass to flourish, and can migrate over very long distances. In turn, these grazers stimulate new growth with their trampling feet, keep trees and shrubs from taking over, and provide food for predators including big cats and African wild dogs. This is all part of a natural balance and is made possible because there is enough space, meaning that the grazing animals get enough to eat without over-using the grassland.

Grasslands are not just valuable for wildlife. With their deep and fertile soils, no other habitat is as useful to humans. For over 10,000 years, people have used grasslands to support herds of grazing domestic animals and to grow staple crops. As the number of people has grown, so we have converted more grasslands to farmland.

Each year over two million wildebeest, zebras and gazelles migrate across Northern Tanzania and Kenya in search of green pasture.



GRASSLANDS UNDER THREAT?

The taming of the grasslands has meant that wild animals have lost their habitats. They are forced to try to find food or living space closer to people, and this can lead to clashes. Elephants may damage crops in their search for food, and predators may hunt livestock or even humans if food is scarce elsewhere. Grassland animals are also threatened by hunters. In recent years, attacks by poachers on rhinos to steal their horns has brought the species to the edge of extinction.

Too much grassland habitat is being taken by humans to use for farming. But much of what we grow we do not eat directly. We are destroying vital habitats to give us a meaty diet. The Cerrado savanna is home to a third of the species in Brazil, including the giant anteater, and is home to more than 4000 types of plant that grow nowhere else. But it is being converted into huge farmlands to grow soya beans. This crop is sent to China and Europe to feed chickens and cows, that themselves need large areas of land to farm.

WHAT CAN WE DO?

GET SMART ABOUT HOW WE FARM

With careful choices, our planet can give us space to grow enough food for every person and leave enough space for the incredible wildlife that needs grasslands to survive. We need to think more carefully about what we eat and also how we can farm more efficiently to use less space. We can make crops – and land – more productive, and people are already exploring new ways to farm on the sides of skyscrapers, on floating rafts in the sea, and even underground.

EMBRACE PLANT POWER

If we swap some of our meat and dairy for plant-based foods such as vegetables, pulses, fruits, nuts and grains, then we could feed more people using less space. Producing 1kg of beef uses almost 70 times as much land as producing 1kg of vegetables or grains. Reducing our meat and dairy intake could be the key to a brighter future for grasslands.

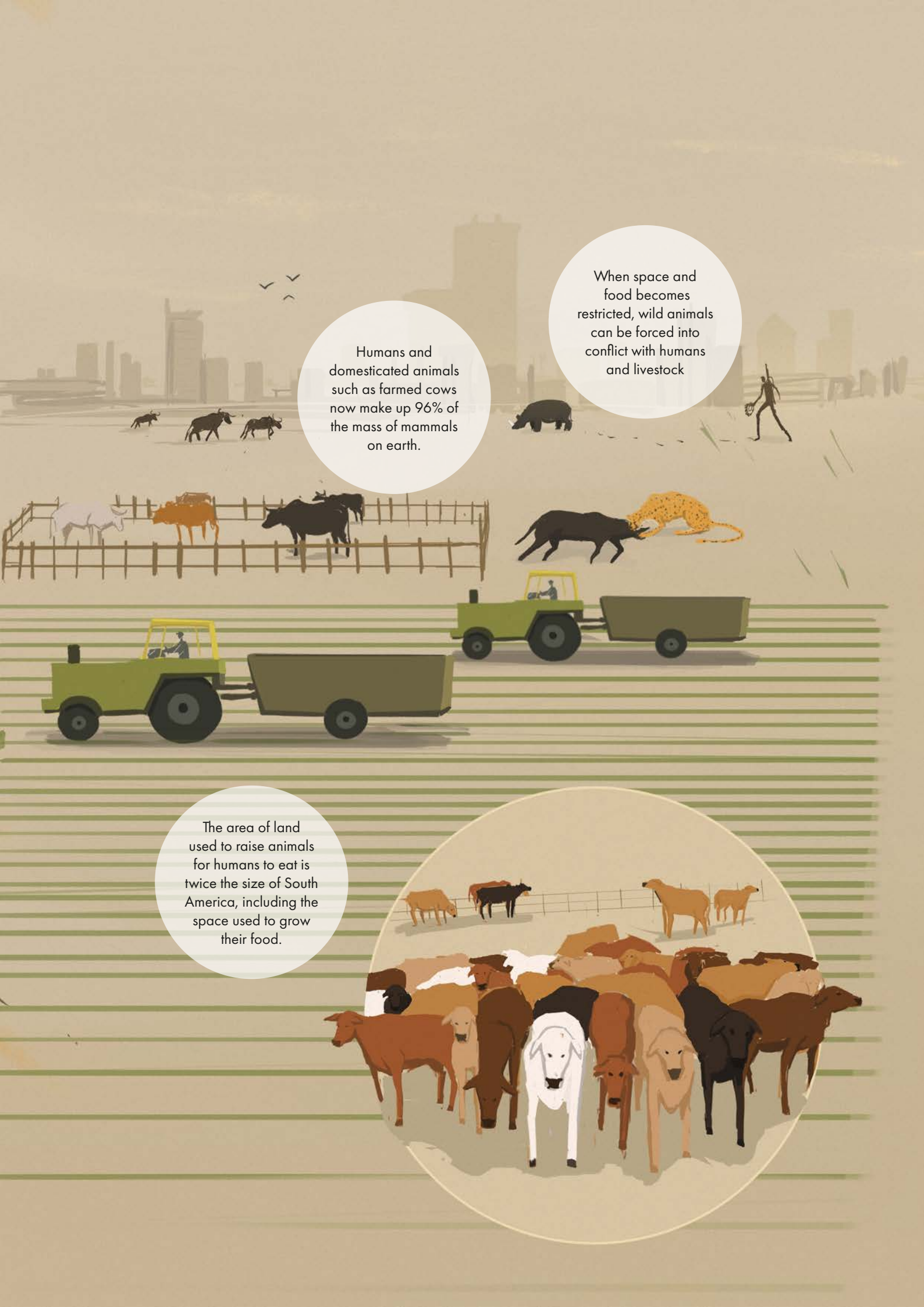


Wild Indian elephants in Kaziranga National Park, Assam, India

// THE CERRADO SAVANNA IS HOME TO A THIRD OF THE SPECIES IN BRAZIL, INCLUDING THE GIANT ANTEATER, AND IS HOME TO MORE THAN 4000 TYPES OF PLANT THAT GROW NOWHERE ELSE. BUT IT IS BEING CONVERTED INTO HUGE FARMLANDS TO GROW SOYA BEANS. THIS CROP IS SENT TO CHINA AND EUROPE TO FEED CHICKENS AND COWS, THAT THEMSELVES NEED LARGE AREAS OF LAND TO FARM."

PROTECT PRECIOUS WILDLIFE

Grassland species need protection from poaching, and their migration routes must be kept clear to allow them to travel the distances they need to find food.




Humans and domesticated animals such as farmed cows now make up 96% of the mass of mammals on earth.

When space and food becomes restricted, wild animals can be forced into conflict with humans and livestock

The area of land used to raise animals for humans to eat is twice the size of South America, including the space used to grow their food.





If humans ate less meat and more plant-based foods we would need less space to farm for farmland.

Grassland ecosystems depend on there being space for animals to roam great distances to find food.

New ways of farming can help us to produce the food we need without taking up more space in grasslands.

MEET THE LOCALS: CHEETAHS

The cheetah is the fastest land mammal and can reach a speed of 60 miles per hour in just 3 seconds, though they can only keep this up for a few hundred metres. It is extremely agile and, with its stretchy and flexible spine can make swift and sudden turns as it hunts its prey. Huge nostrils mean that it can fill its lungs with extra air for the chase while its long tail acts as a rudder and helps it stay balanced.

Cheetahs hunt in the day. This means they avoid the leopards and lions who often prefer to hunt at night. They usually feed on smaller antelope, and they have to eat their prey quickly as they are too small to defend it from other animals, such as hyenas.

Cheetahs are sociable animals. The young stay with their mother for up to 2 years, and although female cheetahs then go off alone, brothers stay together for several years. A cheetah usually has 3 – 5 cubs but most do not survive beyond the first year as they are killed by lions, hyenas and even baboons.

Cheetahs live on the grasslands of eastern and southwestern Africa. In the Masai Mara in Kenya, they have adapted to make use of the landscape, perching on termite mounds and fallen logs to search for their prey. Their spotted coats blend with the high grasses – ideal when they are hunting.

But as human populations grow the cheetah's habitat is shrinking. With less hunting space and less natural prey to catch it becomes harder to survive and cheetahs, in some places, are coming into conflict with farmers. Today there are only about 7000 cheetahs left in the wild, compared to 15,000 counted in Southern Africa in the 1970s.

Humans are one of the greatest threats to the cheetah in the wild. Over 90 percent of cheetahs live outside protected management areas, meaning that they live and hunt in areas shared with human communities, many farming sheep, cows and goats. Cheetahs naturally see these farmed animals as food and can be responsible for killing and eating livestock.

To the farmers the loss of even a single animal can be critical to their livelihood and cheetahs have been shot or poisoned by farmers who see them as a pest. Conservation organisations are helping farmers to protect their livestock in ways that do not harm cheetahs, such as having dogs guarding the farm to deter cheetahs and other predators. However, the problem will only get worse unless we can find ways to live and farm that also allow cheetahs and other grassland wildlife the space they need.



FACILITATOR INSTRUCTIONS

KEY MESSAGES

PROBLEMS FACING OCEANS

- Reduction of space and blocking of migration routes due to large-scale farming
- Pollution of grassland habitat due to use of chemicals on farms
- Illegal hunting of endangered grassland animals for ivory or horn
- Human-wildlife conflict due to encroachment of human habitations and farmland into grassland habitat

SOLUTIONS

- Use less space for farming by reducing meat and dairy consumption and designing new efficient ways to farm
- Protection of migration routes for grassland animals
- Control the use of chemical pesticides and fertilisers on grassland farms
- Crack down on the illegal wildlife trade to deter poachers
- Educate local communities to find solutions to human-wildlife conflict that limit damage on both sides

SDGs LINKS

Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss

<https://www.un.org/sustainabledevelopment/biodiversity/>

Ensuring a healthy and productive future for our grasslands also contributes to other SDG goals, including the following:

GOAL 2: Zero Hunger

GOAL 12: Responsible Consumption and Production

GOAL 13: Climate Action



GUIDED DISCUSSION PROMPTS

Use these prompts to generate a class or small group discussion based on the Our Grasslands briefing, or videos on ourplanet.com.

What is grassland like? What would it be like to spend time there and what might you see?

Through this discussion, children will be identifying the characteristics of grasslands which can be found on every continent except Antarctica.

How do humans use grassland landscapes and what effect could these activities have on wildlife?

Safaris, hunting, farming, building homes. Space taken up by human farms and developments means less space for wildlife and cuts off their routes for migration, hunting or foraging. Noise, light and pollution could disrupt natural wildlife behaviour. Hunting could drive species to extinction and have a knock-on effect on other species.

Producing 1 kg of beef needs 70 times as much land as producing 1 kg of vegetables. What will happen if we keep turning grasslands into farmland? Why do you think meat production needs so much land?

What might happen to the species that live on grasslands? They will have less space and less food, so will become stressed and start to die out. If grassland soil is converted to farm or grazing land, and not cared for properly, then the nutrients in the soil are lost and nothing grows.

What could we do to help?

Eat less/no meat

Grow our own food locally

Farm in different ways (vertical, underground, rooftop, floating farms etc)

Protect grassland habitats as nature reserves

ACTIVITIES

ACTIVITY IDEA	SUGGESTED AGE	SUBJECTS
Keep a log of the foods you eat in one day. Determine how much of your diet came from grains, either directly from breads and cereals, or indirectly from livestock raised on grain products. How many different countries does your food come from? What does this mean for grasslands and the wildlife that live there?	7 – 14	Geography
Make a list of all grassland landscapes around the world and the wildlife that live there. Which are the strangest grassland creatures and which grasslands were in places you did not expect?	7 – 14	Geography
In small groups imagine an area of grassland (or bring up a satellite image on Google Earth) and consider how many of each animal or plant it could support. Consider the way they are interconnected, and what things could affect their numbers for better or worse. Consider seasons, rainfall, connectivity and space.	10 – 14	Geography
Make puppets of grasslands animals – glove or shadow puppets work well. Then create a performance for others with an environmental message.	6 – 11	Art Literacy Geography Citizenship
Design a farm that produces food using as little space as possible. Where would it be? What resources would it need to work?	11 – 14	Art & Design Science Geography
Write a short story or diary about the day in the life of a ranger working in a grassland national park to prevent poaching.	11 – 14	Literacy

More information

Grasslands: <https://www.wwf.org.uk/where-we-work/habitats/grasslands>

Get to know the Cerrado: <https://www.youtube.com/watch?v=kYm3fuHq6eM>



OUR FORESTS AND JUNGLES

Forests and jungles touch our lives every day. They have done for millions of years, since the world's first peoples used them to get shelter, food, water, and firewood.

Today, 300 million people still live in forests and over one billion people depend on them for their livelihood. Forests cover almost one third of our planet's land area and well over half of the species found on land live in forests.

There are many kinds of forest on our planet, but they all contain a delicate balance of plants, animals, fungi and bacteria. Forests provide us with many resources, including food, paper, building materials, chocolate, medicines, and even the air we breathe. Forests make rainfall and filter freshwater. Most importantly, they are the lungs of our planet, and soak up carbon dioxide and other greenhouse gases that cause climate change.

WHAT'S HAPPENING TO FORESTS?

Forests are under threat. Every year 8.8 million hectares of natural forest are cut down – that's an area the size of a football field every second. Forests are being cleared for agriculture, often to grow food for animals such as pigs and poultry. In many parts of the world, illegal logging is leading to damage or loss of healthy forests. Many protected tree species are being over-harvested, and the wood is sold to be used for buildings and furniture. Around the world, wood is still used by more than a quarter of the world's people for cooking and heating – and the world population is growing.

Forests are naturally resilient, and areas cleared of tree cover can spring back to life if given a chance, even after huge forest fires. In fact, natural fires started by lightning may seem to be a terrible thing for forests, but actually often allows them to grow back stronger and to support a bigger variety of animals and plants than if the trees just kept growing. Some pine trees are adapted to frequent fires, and have cones that only open to release seeds in the heat of a fierce fire. The ash after a fire is filled with nutrients and perfect for new plants and trees to grow in the space left by the trees that have burned to the ground.

Vegetation recovering in conifer forest after a fierce forest fire in Kings Canyon National Forest, California, USA.

OUR PLANET
NETFLIX





Great Hornbills fly vast distances in search of fruit, and deposit seeds along the way. This spreading of seeds helps the forests of the Western Ghats in India thrive.

FORESTS FOR THE FUTURE

We should all think carefully about how we use wood and the products made from it. It is best to use reused or recycled materials first and then if, we buy new, to ensure that the supply is from a responsibly managed source. One way to verify this is to choose products with an FSC label which shows that it comes from a well-managed forest where removal of trees for timber is done in a way that allows the forest and its inhabitants to continue to thrive for the future.

We also need to help forests recover by allowing areas that have lost tree cover to become forested again, especially where this connects fragmented pieces of forest into landscapes covered in trees. We know that forests are resilient and can recover if we let them. Doing this will ensure that amazing wildlife has a home, while we still have the benefit of wood and other forest products from well managed forests now and in the future.

SEASONAL FORESTS

Forests located far from the equator experience extreme changes in temperature and length of daylight hours each year due to the tilting of the earth that takes them closer to, or further from, the sun. This means that the species living in these forests are used to dealing with change and can recover from difficult conditions or damage. In many places, including Western and Central Europe, East Asia and the Eastern United States, many forests are 'deciduous'. This means that the trees shed their leaves every year in the Autumn, so that they avoid damage caused by cold and snow. Other seasonal forests consist of mainly conifer trees, such as the pine forests of Eastern Russia. Conifer trees are evergreen trees that have scale or needle shaped leaves with a waxy coating that helps them cope with extremely cold or dry conditions. This allows them to have leaves all year round, though the oily coating to the leaves can mean that they can burn very quickly if there is a forest fire.

FRAGMENTATION


Unfortunately, human activity can cause damage to forests from which they are less able to recover, and which can make life difficult for the wildlife that live there. When forests are completely cleared to make space for farmland, the amount of forest is decreased and what remains may become split into smaller separate pieces. These smaller fragments of forest may not be able to support wildlife that a large forest can. This splitting of forests into smaller areas is known as 'fragmentation', and is one of the biggest threats to forests globally. They are being cut into pieces by farms, but also by roads, rail tracks, pipelines and pylons.

Less than a quarter of the world's forests are part of large unbroken expanses of trees where large animals such as tigers and bears have enough space to hunt or forage for the food they need to survive. A single grizzly bear may need 1,000 square kilometres (385,000 square miles) to itself. These animals also spread seeds in their droppings, so they are an essential part of the forest ecology. Predators like the Siberian Tiger keep deer populations under control, which stops overgrazing from damaging the forest ecosystem. Fragmented forest cannot support these large animals.


Plantation forests (areas of land planted with trees specifically to provide timber) can be carefully managed so that less pressure is put on natural forests. Well managed plantations close to natural forest can protect and expand the habitat for wildlife, and brings many of the same benefits to the environment that natural forests do.

Boreal Forest in winter, Haines, Alaska, USA.






Forests absorb carbon from our atmosphere and store it in their trunks, roots and the soil, helping slow climate change.



Forest fires seem destructive, but large healthy forests are resilient and can recover stronger than ever.



Large forest predators control populations of plant eating animals that can prevent new growth, but need big areas of continuous forest.



Existing and newly planted forests can be managed sustainably so that they provide wood without areas needing to be cut down.



MEET THE LOCALS: THE RING-TAILED LEMUR

The ring-tailed lemur is found only in the dry forest and bush of southern Madagascar, which is a large island in the Indian Ocean with a unique ecosystem resulting from being cut off from the rest of the world for so long. The ring-tailed lemur is a large primate with a distinctive tail with alternating black and white rings. Ring-tailed lemurs are sociable and live in groups of around 17 members. Although they are very good climbers, ring-tailed lemurs spend a third of their time on the ground foraging for food. They roam long distances to find leaves, flowers, bark, sap, and small invertebrates to eat. When the lemurs travel over ground, they keep their tails in the air to ensure everyone in the group is in sight and stays together.

Sadly people are destroying the forest in Madagascar that is home to these lemurs and many other beautiful creatures that cannot be found anywhere else. Trees are cut down to be turned into charcoal and so that the land can be used for farming by local people who have little option due to poverty. These ring-tailed lemurs are therefore classified as 'endangered', and seventeen kinds of lemur have already become extinct because of the loss of their forest habitat. This is having another effect on the forest ecosystem. Some of the trees have evolved to rely on large lemurs that would eat their fruit and then spread the seeds in their droppings. The kinds of lemur still alive in the forest are not big enough to eat the fruit from those trees, so no more of those kinds of trees will grow to replace the ones that are standing now when they reach the end of their lives.



JUNGLES

The forests with the most plentiful and diverse wildlife are the jungles near the equator (the imaginary line around the middle of the planet), where they do not experience the seasonal changes that are felt in the North and South due to the tilting of the earth on its axis. This rich biodiversity is a result of the constant warmth and wetness of tropical rainforests, where the trees are leafy all year round, there are no big changes in temperature due to seasons and nature is fully active all year round. Jungles have different levels – each providing habitat for different species. A small area of jungle can be home to a huge amount of wildlife, from the forest floor up to the thick canopy. In the Amazon rainforest, 2.5 sq km of jungle can be home to more than 50,000 insect species, and some types of tree may only be found in one small area where they have evolved.

The unchanging temperature and constant warmth of the jungle mean that some species are only used to those conditions, and are not able to cope if their habitat changes. This means that when human actions have an impact on a jungle it can cause serious problems for the wildlife living there. Lots of species in jungles have developed relationships that mean they depend on each other for their survival. This means that if one species is damaged it can also cause problems for other species in the same part of the jungle – or even in other areas.

THE WORLD'S GREATEST RESOURCE?

All forests clean the air we breathe, breathing in carbon dioxide and releasing oxygen. This process, called 'photosynthesis', happens faster in the wet heart of tropical rainforests than anywhere else on our planet. Jungles also regulate our climate. Like giant sponges, they soak up water through their roots and return it to the atmosphere through their leaves. This moisture is carried in the air to other parts of the world and falls as rain, so the jungle actually ensures that other parts of the planet have the water that is needed for life to survive. Jungles give us precious resources. Much of the food we eat – coffee, avocados, bananas, lemons, oranges, cacao beans to make chocolate, cashews, peanuts, pineapples and papayas were first found in the jungle and are now farmed for our enjoyment. Many medicines that we use today were discovered by studying chemicals produced by plants and trees growing in jungles. Scientists believe there are many more discoveries to be made that could help us stay healthy in the future.

DISAPPEARING JUNGLES

Jungles are perhaps the most endangered habitats on earth. In the Amazon basin we are currently losing an area of rainforest around the size of 3 football pitches every minute because it is being destroyed by humans for timber,



Forests and jungles play an important role cleaning, storing and distributing freshwater. Over three quarters of the freshwater humans can access comes from forests, and air that passes over large forest areas produces much more rainfall than air that has passed over little vegetation.

farmland, and to clear the way for roads. Destroying the jungle harms us all. People lose their homes, security and income. Animal species face extinction, and the planet becomes more vulnerable to climate change.

SAVING THE JUNGLE

Local communities can be supported and empowered to allow them to protect the jungle and make a living without destroying jungle for farmland or timber. People who have used these jungles for generations can continue to do so, while ensuring that the amazing wildlife that shares the jungle – and future generations of people – can do so too.

Some crops can be grown in the jungle without removing the trees. By planting lots of different crops under the canopy (fruit, nuts, coffee etc) an area of jungle can provide food and income for local communities without any areas ever being cut down completely. This creates a more natural ecosystem than on a farm growing a single crop, so fertilisers and pesticides are not needed. There are also techniques that can enable some harvesting of trees for timber and other resources from the jungle in a way that allows it to stay healthy and recover, and all the different crops together provide enough to support farmers. This is called Agroforestry.

We depend on jungles but we risk losing them if we don't act now. We can use the jungle in a way that does not destroy it for future generations. We can all make sure that we live in a way that protects our precious planet. One way is by making sure that we ensure that products we buy are not produced at the expense of the jungle.



Jungles release billions of tons of water vapour, creating clouds that reflect sunlight and transport water around the planet.



Jungle is being destroyed to clear land to grow palm oil and other crops, but we could use land that is already cleared instead.



A jungle contains many connected 'micro-worlds' filled with wildlife that may not exist anywhere else.



ORANGUTANS AND PALM OIL

Orangutans are the world's heaviest tree-climbing mammal and they live their lives almost entirely in the trees. They move by swinging from one tree to another using their long arms and grasping hands and feet. They mainly feed on fruit and are known as the gardeners of the forest because they spread seeds which helps new trees grow.

Unlike other primates, orangutans do not live in large groups. Adult males are usually found alone, and females live with their offspring. They give birth about every five years, usually to one baby. There is such a lot for young orangutans to learn about survival in the forest that they usually stay with their mother until they are about 7 years old, longer than any other animal. In the wild, orangutans can live up to 50 years.

The greatest threat to the orangutan's survival is the loss of their jungle habitat as trees are chopped down for timber and land cleared to make way for palm oil plantations. This vegetable oil is used in more than half the packaged products in our supermarkets, from ice cream and margarine to soap and lipstick.

There are two species of orangutan – the Bornean and Sumatran – and they are both very similar. They once

lived in jungles across Southeast Asia but today they live on just two islands, Borneo and Sumatra, and are critically endangered. A century ago, there were probably 230,000 orangutans – around four times as many as there are today.

To help save orangutans we can all try to make sure that the palm oil in the products we buy has been grown responsibly in a way that has not harmed animals or the environment. Environmentally-friendly palm oil is certified by the **Roundtable on Sustainable Palm Oil** or **RSPO**. Look for the label when buying products containing palm oil. If your favourite products contain palm oil and don't have the RSPO accreditation you could write to them and explain why you want them to ensure that they use palm oil that is deforestation free.



FACILITATOR INSTRUCTIONS

KEY MESSAGES

PROBLEMS FACING FORESTS & JUNGLES

- Deforestation due to farming and timber
- Fragmentation of habitat due to roads, railways, pylons and pipelines
- Loss of species specific to one area when areas of jungle are cleared
- Loss of large predators from forests due to fragmentation, unbalancing the ecosystem

SOLUTIONS

- Forests can recover on their own if we give them time and space
- Planting more forests can protect those that remain and the animals that need them to survive
- Agroforestry and sustainable timber extraction can ensure we benefit from forests without destroying them

SDGs LINKS

Goal 15: Sustainably manage forests, combat desertification, halt and reverse land degradation, halt biodiversity loss

<https://www.un.org/sustainabledevelopment/biodiversity/>

Ensuring a healthy and productive future for our grasslands also contributes

to other SDG goals, including the following:

GOAL 2: Zero Hunger

GOAL 12: Responsible Consumption and Production

GOAL 13: Climate Action



GUIDED DISCUSSION PROMPTS

Use these prompts to generate a class or small group discussion based on the Our Forests & Jungles briefing, or videos on ourplanet.com.

Have you ever spent time in a forest or woodland? What did you do in the woodlands? What was special about the place? If they have not done so, would you like to visit a forest? Why?

Allow the young people to begin by discussing their own experiences and impressions.

Imagine you are in the jungle. What is this place like? What are some of the sounds that you might hear here? What might you see here? What would it feel like? Would you like to visit the jungle? Why?

To create a relaxed group setting, give young people time to talk together in pairs, before sharing their thoughts with the whole group.

Why are forests important?

Encourage young people to come up with as many ideas as they can. Many foods and medicines come from jungles, they clean the air we breathe, they regulate the earth's climate, they are home to millions of plant and animal species, as well as millions of people.

What animals, plants and insects may live in forest or jungle?

Mammals such as lemur, bear, deer, squirrels, raccoons, badgers etc. Minibeasts like butterflies, beetles, spiders, flies, bees, wasps etc. Birds such as nuthatch, rooks, eagles, great hornbill etc. Amphibians such as newts, reptiles such as snakes etc. Plants such as ivy, wildflowers, bracken etc. Fungi and lichens, and of course trees!

Think of all the ways that forests have touched your life today. What have you used that comes from a forest?

Encourage young people to come up with as many ideas as they can, including furniture, building materials for floors, doors and window frames, fruits, paper, tissues, clean air, pencils, toys, musical instruments, boats, medicines, fences, lollipop sticks, rulers – the list goes on!

What does the ice cream that you get from the supermarket have to do with the future of orangutans?

This question gives the opportunity to look at the impact of deforestation. With younger young people it may help to provide extra clues by writing the following flash cards: palm oil, orangutan, jungle, ice cream, plantation. Ask young people what the links between the cards are.

What threats are forests and jungles facing?

Clearing for farming land and housing, fragmentation, logging for timber, increased noise and light pollution from human settlements.

What can we do to protect the jungles and forests?

At this point it is important to give young people the chance to think about the importance of sustainability and preserving forests for future generations. We can all think carefully about how we use forests. Small steps, such as saving paper, can make a big difference. Any wood or paper bought for school or home should be FSC.

Helping local communities to care for and protect the rainforests.

It is important to help young people understand that they can do something about the challenges that our planet faces. Buying sustainable palm oil products and telling parents, shopkeepers and others in their community why it is important.

ACTIVITIES

ACTIVITY IDEA	SUGGESTED AGE	SUBJECTS
Create a collage display from magazines and materials showing all the everyday products and benefits that we get from forests and jungles on one side, and all the wildlife that depend on forests and jungles for their survival on the other.	6 – 8	Art Geography Science
Carry out a 'sensory walk' in a woodland, with young people closing their eyes to experience the woodland through the other senses, guided by a partner. They should be encouraged to close their eyes or put on a loose blindfold and explore the textures, smells, sounds and feel of the environment. Discuss afterwards if they noticed anything that they had not before.	7 – 14	Outdoor learning Geography Science
Explore a woodland or forest with a notepad and/or camera, and try to identify as many different species as possible.	7 – 14	Science Geography Outdoor learning
Identify different tree species in a woodland and explore the differences between them. Make bark rubbings, outlines of leaf shapes, seed types and field sketches to illustrate how they are similar and different. Discuss why the trees may be so different, and how their different characteristics may help them in different ways.	7 – 11	Art Science
Make a diorama of a jungle habitat.	6 – 8	Art
Recreate the sights and sounds of a forest or jungle using dance, voice and percussion.	6 – 8	Music
Write a riddle about a jungle animal. Think about where the animal lives, how it moves, what it eats and its size, colour etc. What makes this animal special? Read the riddle out and see if others can guess the animal.	7 – 11	Literacy Science