



© Christopher Michel

Protect the ocean

Sustainability Goals:



Subject links:

Science, Geography, English,
Citizenship

Ages 5-7

Curriculum links:

Human impact, Economic activity, Natural resources,
Group work, Presentation, Sustainability, Environmental
responsibility

Ocean Literacy Principles:

6. The ocean and humans are inextricably interconnected

Learning Objectives:

- To understand that humans impact the ocean whether we live inland or on the coast
- To understand how the ocean is part of all our daily lives
- To develop presentation skills
- To be able to work in groups to set up and organise a school initiative
- To inspire action across the whole school

Resources provided:

- [Ocean Threats Fact File](#)
- [What did the ocean ever do for us? \(video\)](#)
- [Ocean Habitats Fact File](#)
- [Ocean threats cards](#)
- [Ocean Manifesto](#)

Step 1

Background

The ocean is home to 50–80% of all life on Earth. It's also fundamental to the water cycle, provides oxygen, stores carbon, regulates the climate, and provides food. But there are many threats facing the ocean, including climate change, overfishing, marine litter, coastal development and oil spills. Learn more about these issues in the [Ocean Threats Fact File](#).

It's vital we protect marine ecosystems to ensure we have a healthy ocean in the future, for the benefit of both biodiversity and coastal communities. No matter where we live in the world, our actions have consequences for the marine environment, which means we can all do our bit to help protect the ocean.

Step 2

Set the Scene

10 minutes – Why is the ocean important?

Ask students to discuss in pairs how they think humans benefit from the ocean. Discuss answers as a class and make a brainstorm of ideas on your whiteboard. Watch the video [What did the ocean ever do for us?](#) and add to your brainstorm with points raised in the video.

Step 3

Activities

Activity 1: 10 minutes – UK wildlife

Give students two minutes to write down the names of as many marine animals as they can think of on mini whiteboards. Discuss their answers. Show some examples of UK marine wildlife using the [Ocean Habitats Fact File](#).

Activity 2: 20 minutes – Ocean threats

Split the class into five groups. Each group should be given one of the [Ocean Threats cards](#). Students should analyse the photos and discuss what they think the threat to the ocean is, why it's bad and how we could reduce the impact of this threat. Students can then check their ideas with the text on the back of the cards. Students should then prepare a one minute presentation to tell the rest of the class about the threat they have learnt about. During group presentations, display the corresponding images on your whiteboard to show the rest of the class.

Activity 3: 20 minutes – Ocean Manifesto

Introduce the [Ocean Manifesto](#), discussing each pledge and how it relates to the students and the ocean. As a class, vote for your favourite action from the manifesto. Students should work together in groups to come up with ideas for how they could implement the action in school.

Step 4

Extend

30 minutes – School-wide initiative

Groups could share their ocean action ideas with the rest of school during an assembly and have a whole school vote on which of the ideas to implement. Your class should then be key in ensuring this action goes ahead, helping to run the project throughout school and evaluate its overall success. We would love to hear about your project! Share your story on social media and tag @mcsuk or email us at education@mcsuk.org.

Step 5

Reflect

Why is the ocean worth protecting? What threats does the ocean face? Name one way your school can help protect the ocean. How can you take what you've learnt in class to help protect the ocean at home?

Step 6

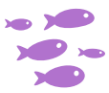
Follow up

As a school you could work towards completing all activities in the [manifesto](#). To learn more about wildlife in our seas, take a look at the [Amazing Ocean](#) series with lessons on a range of topics including habitats, food chains, life in the deep sea and sharks. To learn more about climate change, complete our [Climate, the sea and me](#) lesson plan.

Ocean Threats Fact File

The ocean provides us with many resources that we use in our daily lives, from food and medicine to fuel and electricity. Marine industries also provide a source of income for thousands of people.

With a growing population, the demand on ocean resources is increasing, and our seas are facing many threats.



Overfishing

Overfishing means catching fish faster than they can reproduce. Many fish stocks are in a state of serious decline due to overfishing. Overfishing pushes fish populations into smaller and smaller numbers, until there are so few fish that fishers can't make a living and fish populations find it hard to grow again. Approximately 90% of large predatory fish such as tuna, swordfish and sharks have been lost. (1)



Trawler vessel
© NarisaFotoSS



Oil spill

Drilling for oil and gas can pose serious threats, from construction of platforms, transporting of goods, creating pipelines, releasing greenhouse gas and destructive oil spills.

Oil spills can affect all marine wildlife, but as most oil floats, birds are particularly at risk. Oil clings to their feathers, reducing their ability to fly and causing a loss in the waterproof properties of their feathers. This means that they can't keep themselves warm and can die of hypothermia. Marine animals can also ingest oil, which is poisonous to them.



Oil washing up on a beach
after a spill © NOAA

Ocean Threats Fact File



Climate change

Climate change is the long-term global shift in the planet's average temperatures and weather patterns. Human activities are adding greenhouse gases like carbon dioxide, methane and nitrous oxide into the atmosphere, causing a greenhouse effect around the Earth which traps the sun's rays and heats up the planet.

➤ High temperatures are causing ice to melt on land, leading to a rise in sea levels. This sea level rise will affect coastal habitats and communities across the world.



Flooded community
© srv007

➤ The reduction in sea ice is also affecting many animals in polar regions who are dependent on sea ice, including polar bears and penguins.



Polar bear
© Smudge 9000

➤ An increase in carbon dioxide is altering the chemistry of the ocean and causing ocean acidification. This affects many animals with a calcium carbonate shell like scallops, mussels, crabs and corals.



Bleached coral
© ARC

➤ An increase in the frequency and size of storms is damaging fragile marine habitats like seagrass beds and coral reefs.

➤ Plants and animals are being forced to travel north or to greater depths to search for cooler waters.

Ocean Threats Fact File



Tourism and coastal development

Many people use beaches and coastal waters for recreation and tourism, and this tourism is an important livelihood for many people in the UK and benefits the economy.

However, activities on the ocean like boating can discharge oil, damage seabed habitats through anchoring, and cause noise pollution. Coastal development on land reduces areas of natural coastal habitats. This reduction not only directly reduces biodiversity, but also reduces vital functions these habitats provide, like helping protect land from erosion and helping to filter nutrient runoff from land.



Falmouth, UK
© Tim Green



Marine litter

Litter reaches the ocean in a number of ways: it's washed in from our rivers, is left on our beaches, or is cast overboard from boats.

It not only makes the marine environment look unpleasant, but it impacts the health of thousands of marine animals every year, usually by ingestion, entanglement or suffocation. Chemicals used in, and absorbed by, plastics also negatively impact animals' health. Plastic is the most commonly-found beach litter material, and it doesn't biodegrade, but breaks up into smaller and smaller pieces, which can be mistaken for plankton or other food sources.



Gull with plastic packet
© Ingrid Taylor

Ocean Threats Fact File



Managing the ocean

Managing the ocean is tricky, as there are many stakeholders with conflicting interests and opinions, including governments, commercial industries, large and small-scale fishers, tourist industries, environmental NGOs, scientific communities and coastal residents.

To ensure a healthy ocean for the future, we must reduce habitat damage, ensure we harvest resources sustainably, and protect vital ecosystems.

How can we protect the ocean?

- Legislation and laws are in place to reduce threats, and many marine activities require licences.
- Marine Protected Areas (MPAs) are similar to nature reserves. They're set up to protect specific species or whole habitats. MPAs can reduce destructive activities and protect and recover biodiversity.
- Fully Protected Marine Areas or No Take Zones are strict MPAs where all damaging activities are banned to allow habitats a chance to recover and thrive.
- Restoration projects, like the EU LIFE Recreation ReMEDIES project, aim to actively restore habitats through conservation work.



Inner Sound of Skye, the site of an MPA © Reading Tom



Seagrass bed
© Benjamin L. Jones.

Ocean Threats Fact File



Protecting our ocean

It's vital we protect marine ecosystems to ensure a healthy ocean for the future. No matter where we live, our actions have consequences for the marine environment, which means we can all do our bit to help the ocean.

One thing we can all do is learn more about the ocean and how amazing it is. This will increase our desire to protect it, and we can share our love of the ocean to inspire others too. Find out how you can reduce the impact of the threats below:



Climate change

- Use less electricity at home and at school
- Adjust our diets at home and school to reduce our carbon footprint
- Use greener transport methods such as walking, cycling and public transport



Overfishing

- Use our Good Fish Guide to find out which seafood species are unsustainable and should be avoided
- Change the types of fish we eat at home and at school



Marine litter

- Reduce how much waste we create at home and school
- Use a lunch box instead of clingfilm
- Use refillable drinks bottles and replace plastic straws with metal
- Use your own bags when shopping
- Join local litter picks



Coastal tourism

- Support the designation of Marine Protected Areas
- Be conscious and considerate of the ocean and its wildlife at the seaside



Oil spills

- Switching to a green energy supplier
- Use greener transport methods such as walking, cycling and public transport

Ocean habitats Fact File



UK ocean habitats and wildlife

Saltmarshes

Saltmarshes are tidal habitats found along sheltered coastlines. Saltmarshes are very muddy, making them a great home for worms, and a great place for birds to feed.

Saltmarsh species include:



© Dronegraphica



Lugworms live underground in a U-shaped burrow. They make their burrow by eating sand and mud and pooing it out. They're a favourite food for many birds.



Curlews are famous for their long, curved beak. They are named after the 'cur-lee' sound they make. The number of curlews has reduced and they are at risk of extinction.



Mud shrimp live underground in a U-shaped burrow. They use their large antennae to dig, and they shed their skin like a snake when they grow.



The **oystercatcher** has a loud high-pitched bird song, which sounds like 'kleep kleep'. Their beaks can be flat like a hammer to smash open shells to eat, or they can have a sharp beak to slice shells in two.

Key terms

A **habitat** is the natural home or environment in which an animal, plant or organism lives. A habitat contains all an organism needs to survive, like food and shelter.

A **microhabitat** is a small area within a larger habitat, which is home to a creature.

A **species** is a group of living organisms of similar individuals that share common characteristics and are capable of interbreeding.

Ocean habitats Fact File



UK ocean habitats and wildlife

Rockpools

Rockpools are tidal habitats found all over the UK on rocky shores. Rockpools are hard places to live with changing tides, sometimes strong waves and competition for space.

Rockpool species include:



© Michael Austin



Limpets have a tongue covered with tiny teeth which they use to scrape algae off rocks to eat. Their teeth are made from the strongest material in the animal kingdom – it's even stronger than most man-made materials.



Beadlet anemones have a jelly-like body. They stick themselves to rocks and use their tentacles to sting and catch prey. They can also curl up into a ball when they need to.



Shore crabs have a hard exoskeleton, which they shed when they grow (like a snake). They use their claws when feeding or fighting.



Common periwinkles are a type of sea snail. They use their foot to glue onto the rock and to scrape algae off the rock to eat.

Ocean habitats Fact File



UK ocean habitats and wildlife

Sandy seafloor

Sandy seafloor is the most common marine habitat. There aren't many plants or boulders to hide from predators, so animals living in the sand have to adapt. Some burrow into the sand to hide and some are camouflaged.

Sandy seafloor species include:



© PublicDomainPictures



Plaice are a type of flatfish and are camouflaged in their habitat. They start life looking like normal fish, but slowly begin to swim horizontally and live on the seafloor. As they go through this change their eyes move around so that both eyes are on top of their head!



Cockles are a type of bivalve, meaning they have two shells. They bury themselves in the sand hiding from predators like flatfish. Their shells have horizontal growth lines which can be used to age them, just like a tree.



Weever fish hide in the sand and have a sharp black dorsal fin which contains poison and is used to scare off predators. These stings can also be very painful to humans when accidentally stepped on.



Sand eels aren't eels, but eel shaped. They are an important food source for seals and seabirds like puffins. To avoid being eaten they swim in shoals.



Burrowing urchins are also called sea potatoes and heart urchins. They use their soft spines to burrow into sediment, and under their spines is a heart-shaped shell.

Ocean habitats Fact File



UK ocean habitats and wildlife

Open ocean

Our part of the open ocean is called the North East Atlantic Ocean. This can be split into smaller coastal seas. There's a huge variety of animals that live in the ocean from tiny microscopic plankton to huge whales.

Open ocean species include:



© Cristian Palmer



Bottlenose dolphins are very clever animals and enjoy being sociable and hanging out in groups. They eat fish and squid and will swallow their food whole.



Bluefin tuna can grow up to 300cm long and can live for around 40 years. They travel all across the world, covering huge distances. They are very fast swimmers and amazing predators.



Basking sharks are 8-10 metres long, making them the second-largest fish in the world. They are filter feeders, feeding on tiny plankton species.



Although **By-the-wind sailors** look like jellyfish, this jelly-like creature is actually made of lots of tiny animals called hydroids. Their sail-like structure helps them to catch the wind and sail across the ocean.

Ocean habitats Fact File



UK ocean habitats and wildlife

Seagrass beds

Seagrass beds are found in calm, shallow, sunlit, coastal waters around the world. Seagrass is the only flowering plant in the ocean. Across the world seagrass beds are important as fish nurseries, as young fish can hide between the plants.



© divedog

Seagrass beds are home to species like:



Spiny seahorses are a type of fish. They can change colour to match their environment. The male seahorse looks after the eggs in a pouch (a bit like a kangaroo pouch).



To hide from predators, **cuttlefish** can change colour to camouflage and they can spray black ink at their predators. They lay their black grape-like eggs on plants to stop them floating away.



Stalked jellyfish – Unlike other jellyfish this creature does not swim around, but spends its life attached to a plant. They have 8 arms, and each arm has about 45 tentacles!



Corkwing wrasse females and baby fish are brown/green in colour. Males are very brightly coloured, but can change colour at night when sleeping to become camouflaged.



What is the threat?

Climate change

Why is it bad?

- Melting ice is changing the habitat of animals like polar bears and penguins.
- Ice melting is also causing sea levels to rise.
- The chemistry of the ocean is changing which affects lots of species, like coral.
- There are more storms which damage habitats on the coast, like seagrass beds and coral reefs.
- Plants and animals are moving away to find cooler waters.

How can we help reduce climate change?

- Use less electricity and gas at home and at school.
- Walk, cycle or get the bus to school instead of driving.



What is the threat?

Marine litter

Why is it bad?

- Animals can accidentally eat litter.
- Animals can get trapped in litter.
- This litter can cause the animal a lot of pain and can sometimes cause the animal to die.

How can we help reduce marine litter?

- Make less waste by using less plastic.
- Take part in a litter pick.



What is the threat?

Overfishing

Why is it bad?

- The number of some types of fish in the ocean are very low because of overfishing.
- Taking too much fish from the ocean can affect the whole food chain.

How can we help reduce overfishing?

- Use our **Good Fish Guide** to find out which fish are fine to eat and which fish should be avoided.



What is the threat?

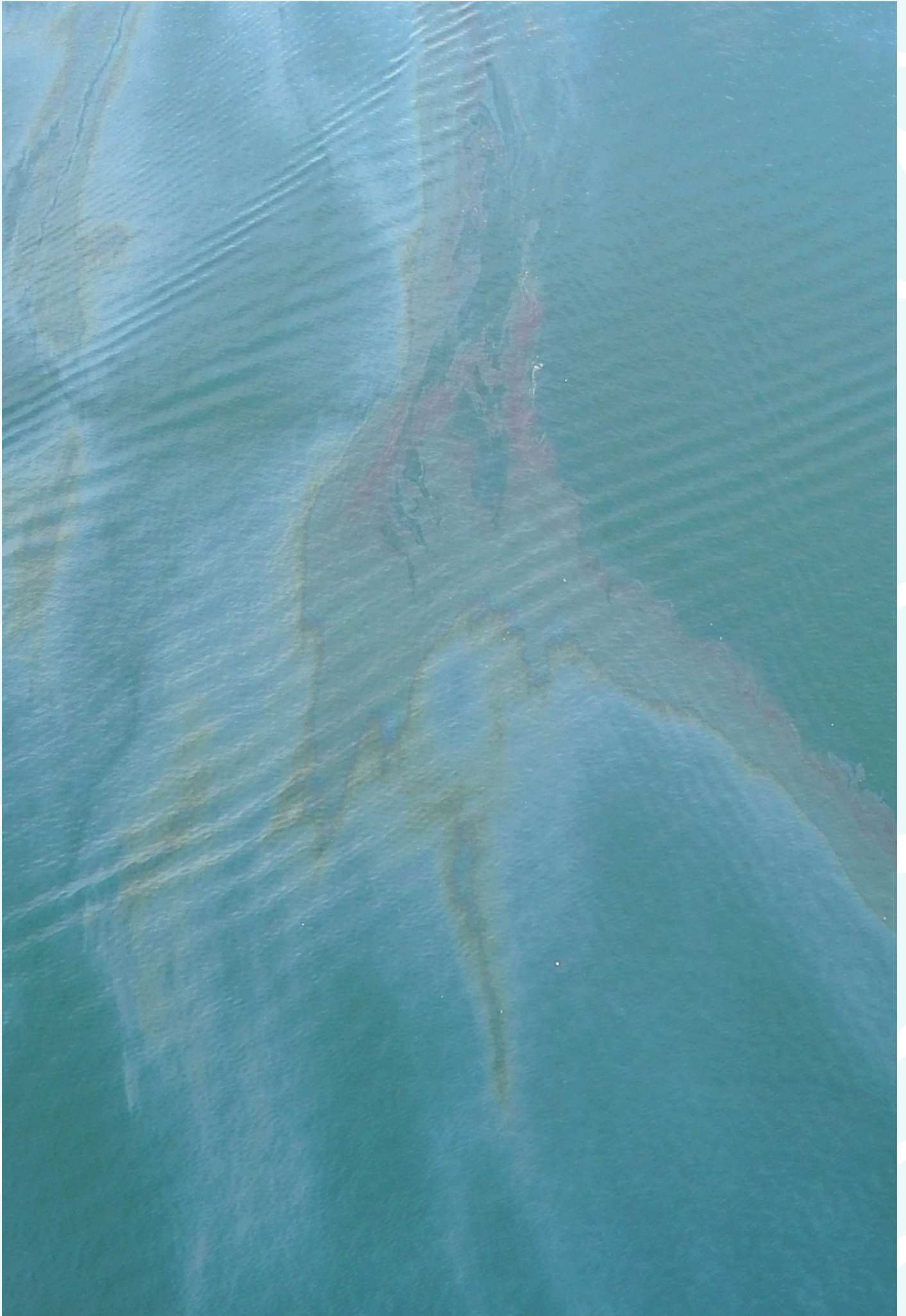
Tourism and coastal development

Why is it bad?

- When we build shops and restaurants on the coast, sometimes they're built onto coastal habitats which are home to many types of animals and plants.
- The noise of building and the noise of lots of people can scare animals in the ocean.

How can we help reduce impact from tourism and coastal development?

- We can make nature reserves to protect coastal habitats.
- Be careful not to disturb wildlife at the coast.



What is the threat?

Oil spills

Why is it bad?

- The oil sticks to birds and they can't fly.
- Some animals accidentally eat the oil which is poisonous.

How can we help reduce the chances of oil spills?

- Walk, cycle or get the bus to school instead of using a car.
- Use less electricity.

One Planet, One Ocean

School Manifesto



Swap plastic for more sustainable alternatives and encourage everyone to use reusable items like bottles, lunch boxes, cutlery and straws



Encourage each other to use more sustainable transport to school, like walking, cycling or car sharing



Save energy by switching off lights, heating, water and technology when not needed



Ensure environmental and marine education is taught in our school



Establish new wildlife areas and initiatives at school, like a pond, vegetable allotment, or wildflower meadow



Reduce, recycle and reuse as much as possible, including composting food waste, collecting rainwater, and taking better care of our resources



Include the wider community in events and educational initiatives, like fundraising days, local litter picks, and swap shops



Create a sustainability team to discuss new ideas to improve our school, like banning cars from idling outside school and ensuring school supplies are responsibly sourced

school pledge to work towards achieving the points in this manifesto.

Signed

(Head Teacher)

Please return this document to education@mcsuk.org

Curriculum links

England

Science

- Identify and name a variety of plants and animals in their habitats.

Citizenship

- Responsibility for themselves and their environment.
- To realise that people and other living things have needs, and that they have responsibilities to meet them.
- What improves and harms their local, natural and built environments and about some of the ways people look after them.

English

- Participate in discussion about books, poems and other works that are read to them and those that they can read for themselves, taking turns and listening to what others say.
- Explain and discuss their understanding of books, poems and other material, both those that they listen to and those that they read for themselves.

Wales

Humanities

- I am beginning to recognise the effects that I have on the natural world.
- I can describe how people and the natural world may impact on each other.
- I am beginning to appreciate and care for living things and my own environment.
- I can take care of resources and not waste them, and I am conscious of the importance of creating a sustainable future.

Science & technology

- I can recognise that plants and animals are living things which grow.
- I can recognise that what I do, and the things I use, can have an impact on my environment and on living things.

Literacy

- I can respond to what I hear, read and view and can express simple opinions on it.
- I can show an interest in books and other reading materials, and enjoy sharing and handling them as a reader.
- I am beginning to recognise and read high-frequency words.
- I can develop my vocabulary through reading, and use these new words in a variety of situations.
- I have experienced a range of different reading materials and literature, and I can follow texts read to me and respond appropriately.

Scotland

Social sciences

- I explore and appreciate the wonder of nature within different environments and have played a part in caring for the environment.
- I can consider ways of looking after my school or community and can encourage others to care for their environment.

Science

- I can talk about science stories to develop my understanding of science and the world around me.

Literacy

- I can use my knowledge of sight vocabulary, phonics, context clues, punctuation and grammar to read with understanding and expression.