

Eco-Schools Marine Topic Resource



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Introduction

The Marine topic covers many aspects of our diverse marine environment. What creatures live in the sea? Why are they important to us? In what ways is the marine environment under threat and how can we protect it?

This topic can be enjoyed by all schools, not just those close to the coast. Did you know in Northern Ireland you are never more than 35 miles from the sea? Much of our cultural identity comes from being an island nation. All the water on the planet is connected and part of one big water cycle.



Schools are invited to investigate water courses from source to sea. What goes down our drains and into our rivers can end up in the sea to the detriment of life there. The actions you take in your home can have an impact on our marine environment. Together let's create positive actions and positive impacts.

The Marine topic supports the United Nation's Sustainable Development Goals (SDGs) 12, 13 and 14.



12. Ensure sustainable consumption and production patterns



13. Take urgent action to combat climate change and its impacts



14. Conserve and sustainably use the oceans, seas and marine resources for sustainable development

What can schools do?

- Raise awareness of the wonders of our marine environment and why oceans are so important to life on Earth.
- Investigate plastic pollution issues and run a campaign to reduce plastic use in your school, local community and at home with a particular focus on banning single use plastic.
- Clean up your local area or coastline. Shout about it and get the local community involved in your actions.
- Take climate action: plant trees, reduce carbon emissions by reducing energy and transport use, write to your MP demanding climate action.
- Be aware of overfishing issues and pledge to eat sustainable fish in school and at home. Investigate your local market, fishmongers or supermarket – is the fish being sold sustainably sourced?



Education should be empowering

Learning about the environmental issues facing our planet can be overwhelming for children and young people making them feel sad, angry and even depressed.

Throughout these lessons acknowledge any feelings of despair, guilt, hopelessness or sense of being overwhelmed, but at all points highlight the potential for positive change and hope.

These lessons include examples of new science and technology, political will and individual and group actions which can make real and lasting change both locally and globally.

Education that provides opportunities for pupils to take action is empowering.

Remember the Eco-Schools seven step framework and think of ways you can connect them to your Marine topic work:



1. Form an Eco-Committee – make them aware of the new Marine topic.

2. Environmental Review – complete the Marine section of your Environmental Review to gauge how well you are currently doing.

3. Action Plan – decide on some actions you would like to take to support the Marine topic such as litter picking, banning single use plastics, creating marine displays, etc.

4. Monitoring and Evaluating – visit the Eco-Schools Data Zone at the start of your topic to take the baseline survey, then complete again when you have studied the topic and see how you have progressed.

5. Curriculum Links – use this great resource and others to integrate some marine lesson ideas into the classroom. You could do some outdoor learning using this topic as inspiration.

6. Informing and Involving – tell everyone in school what you are doing and get them on board for actions. Share ideas and action at home and in the community.

7. Eco-Code – share your marine message for all to hear and see. Perhaps create an interesting visual display or try your hand at a catchy rap.



Curriculum Links

This resource explores the marine environment, discusses the issues it faces and suggests ways that schools can act to protect our marine environment. It has been carefully designed to complement the NI curriculum.

KEY STAGE 2

Subject	Strand	Strand Unit
Language and Literacy	Talking and Listening, Reading Writing.	Receptiveness to language. Competence and confidence in using language. Developing cognitive abilities through language. Emotional and imaginative development through language.
Mathematics and Numeracy	Including processes in mathematics, number, measures, shape and space, and handling data.	2D shapes. Recognising and interpreting data.
The World Around Us	Including interdependence, place, movement and energy, and change over time.	<p><i>Interdependence</i> ‘Me’ in the world. How plants and animals rely on each other within the natural world. Interdependence of people and the environment. The effect of people on the natural environment over time. Interdependence of people, plants, animals and place.</p> <p><i>Place</i> Change over time in places. Features of and variations in places, including physical, human, climatic, vegetation and animal life. Positive and negative effects of natural and human events upon place and time.</p> <p><i>Movement and Energy</i> The causes and effect of energy, forces and movement. Causes that affect the movement of people and animals. How movement can be accelerated by time and natural events such as earthquakes, famine and floods.</p> <p><i>Change Over Time</i> Ways in which change occurs in the natural environment. Positive and negative changes and how we have a responsibility to make an active contribution.</p>



The Arts	Including Art and Design.	Drawing and painting including the use of ICT.
Personal Development	Personal Development and Health. Understanding in the local and wider community.	Me and my home. Me and my school. My environment. The way we live. Our World.
RE	Religious beliefs, practices and values. Alive O programme.	Spiritual understanding: developing a sense of awe and wonder about the world around them. Alive O2 – Water is God's gift Alive O5 – God's love helps us to love the world Alive O6 – Within God's creation Alive O8 – Kingdom ecology

KEY STAGE 3

Subject	Strand
Learning for Life and Work	Local and global citizenship, human rights and social responsibility; equality and social justice; democracy and active participation.
RE	Developing pupils as contributors to society; the economy and the environment.
Geography	Investigate the impact of conflict between social, economic and environmental needs both locally and globally, e.g. pollution, flooding and climate change. Explore how we can exercise environmental stewardship and help promote a better quality of life for present and future generations, both locally and globally.
Design and Technology	Explore the impacts of design and technology on the world and quality of life.
Science	Consider the contribution of science to debates around sustainable development and climate change. Develop appreciation of interdependence within the natural world and between people and planet. Explore ethical issues surrounding science and its pursuit and uses.
Mathematics	Develop critical thinking around use, presentation and manipulation of data.



Source to Sea

Teachers' Notes

Fresh water accounts for less than three percent of the Earth's water and less than half a percent of this water is found in rivers and lakes.

A river is the path that water takes as it flows downhill towards the sea. Rivers can be long or short, wide or narrow, rapid or slow flowing and tributaries (smaller rivers) often join on their way downstream to make bigger rivers.

Rivers carry water and nutrients to areas all around the Earth. They play a very important part in the water cycle as all living things need water to survive. Rivers bring life to the land.

Rivers have always been important to people. In prehistoric times, people settled along the banks of rivers, where they found fish to eat and water for drinking, cooking, and bathing. Rivers are the cradles of civilization. All the major civilizations such as the Mesopotamian, Indus Valley, the Egyptian and the Chinese civilizations have developed on the banks of rivers. Centuries later rivers still provide routes for trade, exploration, industry and settlement.

Today, rivers continue to provide transportation routes, water for drinking and for irrigating farmland, and power for homes and industries. Due to their natural beauty rivers and lakes are popular tourist attractions and recreational activities such as angling and boating are commonplace.

Rivers provide an excellent habitat and food for many of the Earth's organisms. Rivers continue to shape the landscape and determine which plants and animals live in and near them.

Plastic Problems

Microplastics are tiny fragments of plastic smaller than a few millimetres. Rivers act as superhighways carrying these to the sea. Households, industry, transport and poorly managed landfills generate a large volume of microplastic and other debris which travel through river networks, ultimately ending either in riverbeds or in the sea.

See more in the [Trouble with Plastics](#) section.

Do You Know?



The longest river in the world is the Nile

*

18 countries don't have a single river

Saudi Arabia has no permanent rivers

Russia has more rivers than any other country with 1000+

Bangladesh is known as the land of rivers – as it has over 700



Lough Neagh is the largest lake on the island of Ireland and in the British Isles

*

Belfast grew up on the River Farset. This is the origin of the city's name Béal Feirste. The Farset still flows today under High Street

*

The River Bann is the longest river in NI. At 80 miles long it rises in the South East corner and flows to the North West coast via Lough Neagh

*

Pupil Activity 1: My Lagan Love

Aim: To know and understand about stages in the growth of a river

Prep: Assign pupils into small groups. Photocopy and cut out a full set of cards for each group.

1. Instruct groups to *pair* the single river terms to their description e.g. SOURCE = The start of a river. Rivers can have many of these.
2. Next match some of these terms and their descriptions to pictures of the River Lagan (note - not all apply e.g. oxbow lake, meanders, and delta as the River Lagan lacks these features).
3. Finally instruct pupils to place the cards in order of where the features will occur from source to mouth (see card sheet for answer).
4. Draw a diagram of a river on the whiteboard and discuss where the groups have placed each card, coming to a consensus of each correct location to complete a class diagram. Can some of the features be in more than one location?
5. Brainstorm threats and challenges that freshwater sources around the world face. What are the biggest challenges facing our local streams and rivers (e.g. pollution, hydroelectric projects, habitat modification, etc.)?

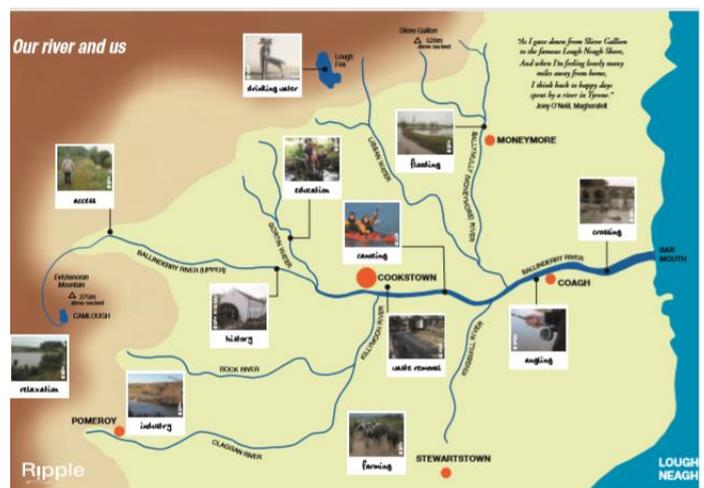


BBC local TV documentary '**Riverland**' explores life in and around Northern Ireland's three major rivers – **The Lagan, Bann and Blackwater**. All three are available to watch on the [BBC iPlayer](#)

Pupil Activity 2: Local River Investigation

Aim: To carry out a river investigation in your local area

1. Identify any local streams or rivers in your locality.
2. Using online maps (i.e. Google Maps) locate and highlight the source and mouth of your river/stream.
3. Explore its unique geography, geology and ecology. How long is it? What sort of land does it run through? Discuss - is your river healthy, is it a natural habitat for many fish, plant or animal species? Can you name many river species?
4. Is there much human activity associated with the river? Does the river flow through any settlements? Has the river flow been altered over time and if so why?
5. Prepare a map of your local river catchment just like this one for Ballinderry River, Co. Tyrone. Create a class display of your local river map identifying its key distinguishing features. Try using ordnance survey map symbols.
6. Invite local speakers into school to share their knowledge about your river - e.g. local anglers, action groups, recreational groups, local fisheries inspectors, rivers agency, etc.



✂ - **ACTIVITY 1 CARDS** – Copy and cut sets

SOURCE	SEDIMENT	MEANDERS
LOWER COURSE	The start of a river. Rivers can have many of these.	UPPER COURSE
Near the source, rivers do not contain much water. They are narrow, shallow channels that flow quickly downhill.	TRIBUTARY	A smaller stream or river that joins a larger one.
MOUTH	OX BOW LAKE	DELTA
Rivers slow down further and become wider as they cross flat ground. Rivers are often at their deepest here.	The place where a river meets the sea (or a lake).	FLOOD PLAIN
Rivers drop sediment when they reach the sea. Sediment can block the river. The water is diverted around the sediment and splits into a fan of smaller streams.		These are caused by bands of hard rock, which rivers swerve to avoid. Over time these can slowly move and change shape.
Rivers slow down as they flow over flatter ground. Tributaries join the river adding more water. River gets wider and picks up sediment.	MIDDLE COURSE	Solid material that is moved and deposited in a new location. It moves through the process of erosion.
Flat lands adjacent to the river which are particularly prone to flooding. Soil is often nutrient rich and popular for agriculture.		This is formed when a meander is cut off from the rest of a river.

<p>A</p> 	<p>B</p> 	<p>C</p> 
<p>D</p> 	<p>E</p> 	<p>F</p> 
<p>G</p> 	<p>Answer: River Lagan features order from source to mouth</p> <p>A – Mouth (Lagan enters Belfast Lough) B – Source of River Lagan (Slieve Croob) C - Upper Course at Finnis (near Dromara, Co.Down) G - Middle Course (River Ravernet tributary joins the Lagan) F – Middle course/ Flood plain E and D – Lower Courses</p>	



Homework Task

- Ask pupils to replace the above Lagan photographs with photographs from your local river. Pupils can either take their own photos or search, copy from online sources.
- Make a model or draw a diagram of your local river.



Useful websites with local interest

- Explore your local river with [The Rivers Trust](#)
- Explore the rivers which flow into Foyle and Carlingford loughs with [The Loughs Agency](#)
- Find out more about the Ballinderry River at [Ballinderryrivers.org](#)
- Find out more about what you can do on waterways and how to stay safe when you visit [nidirect.gov.uk/articles/waterways](#)
- Explore your local rivers features using [azimap](#)
- [Sourcetotap](#) explores the River Erne and the River Derg

Marine Biodiversity

Teachers' Notes

Biodiversity means the variety of all living things on our planet.

Marine biodiversity means the variety of all living things in the marine ecosystem; from the deepest ocean, to the coastal shallows, into our estuaries and to the top of our beaches.

The planet has one large ocean which provides over 90% of the habitable space and contains about 97% of our water. Earth's highest peaks, deepest valleys and largest flat plains are all in the ocean. There are many ocean basins, including the North Pacific, South Pacific, North Atlantic, South Atlantic, Indian, Southern and Arctic and many seas. They are all interconnected.

Our marine ecosystems include a vast array of life with new species being discovered every year.

In Northern Ireland we have many marine habitats including; estuaries, loughs, sandy beaches, sea caves, rocky reefs, sponge gardens, seagrass meadows, kelp forests and mud flats.

These habitats support diverse species, from tiny phytoplankton that we can see only with the aid of a microscope, right up to one of our biggest visitors, the Basking Shark. As well as our year-round local species we have many other seasonal visitors including birds, fish, whales and even turtles.

Powerful Plankton

Plankton are estimated to provide about 50% of the oxygen in the air that we breathe (every second breath) and carry out a unique job to sustain life on Earth forming the basis of marine food chains. They account for about 20% of all photosynthesis on Earth and are also responsible for recycling waste products in the sea.

Plastic Problems

Each year hundreds of thousands of animals are killed by plastics which injure or trap them or which they mistake for food. Plastic can't be digested so animals' stomachs become full, leaving no room for actual food. Once ingested plastics can leach toxins into tissue, which also causes problems with reproduction contributing further to species decline.

Plastic has even been found in tiny plankton at the bottom of the food chain.

See more in the [Trouble with Plastics](#) section.

Do You Know?



Approximately 70% of the world is covered in water

*

Although the exact number of species in the oceans is still unknown, estimates reach over a million

*

The total amount of vertebrate sea life (including fish) has reduced by more than a third since 1970



Northern Ireland has over 300 miles of coastline on both the Irish Sea and Atlantic Ocean and you're never more than 35 miles from the sea

*

Basking Sharks, the second biggest fish in the world can be seen around our shores, but don't worry they feed on plankton

*

Quahogs are a type of clam found in our waters and can live up to 500 years old. That means some are alive today from the 16th century!

Introduction Use a globe to discuss the extent to which our planet is dominated by water and explain how our oceans, seas and rivers are interconnected across our planet – as one ocean. Ask pupils to think about animals and plants they have seen or know that live in and around our seas. Help them to understand that protecting our marine habitats is vital for our planet’s wellbeing.

Pupil Activity 1: Marine Biodiversity in Northern Ireland

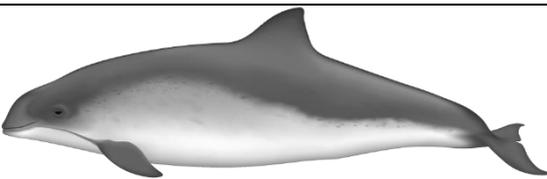
Aim: To understand and appreciate the rich biodiversity of their local marine habitats. Be able to name a variety of marine plant and animal species present in Northern Ireland.

Prep: Copy and cut up the list of local species and place in a ‘hat’. Photocopy blank species cards and give one to each pupil.

1. Explain that they are going to explore a diverse range of magnificent species that we can find in Northern Ireland. Each pupil will be responsible for finding out about their selected species and have a chance to share what they have learned with the class.
2. Show them the completed species card for the Harbour Porpoise as an example of the sort of information required.
3. Go around the class and allow each pupil to choose a species from the ‘hat’.



For homework ask each child to prepare their card on their chosen marine species using the internet. See Marine Species Homework task sheet. For example;

Name	Harbour Porpoise
Group	Cetaceans (whales and dolphins)
Description	One of the smallest marine mammals, grey in colour with a paler underside. It has a blunt beak and mouth that turns up like a smile at the edges.
Picture Draw or stick in a picture of your chosen species	
Habitat	They can be spotted in harbours, close to the shore or sometimes even in rivers. Sightings include: Skerries near Portrush; the Maidens (off Islandmagee); Belfast Harbour; Strangford Lough.
Food	They like to eat fish such as herring, mackerel, sprat and pollock, with an occasional squid or octopus.
Interesting information	When the harbour porpoise captures its prey it turns the unlucky victim around so that it can be swallowed head first, so that the bones don’t get stuck in its throat.
Threats	Pollution such as oil, plastics and getting caught in fishing nets. Overfishing leads to lack of food and increasing competition with dolphins.

The following list of plants and animals are all found in Northern Ireland. Cut up and distribute amongst pupils.



Birds	Razorbill	Dunlin
	Puffin	Curlew
	Oystercatcher	Shelduck
	Light Bellied Brent Goose	Cormorant
	Herring Gull	Arctic Tern
Mammals	Humpback Whale	Common Seal
	Common Dolphin	Minke Whale
	Grey Seal	Bottlenose Dolphin
Bony Fish	Blenny	Conger Eel
	Cuckoo Wrasse	Herring
	Mackerel	Atlantic Salmon
	European Eel	Sea Trout
Cartilaginous fish	Dog Fish	Thornback Ray
	Basking Shark	Common Skate
Crustaceans <i>includes such familiar animals as crabs, lobsters, crayfish, shrimp, krill, woodlice, and barnacles.</i>	Spiny Spider Crab	Barnacle
	Hermit Crab	Lobster
	Shore Crab	Shrimp
	Dublin Bay Prawn	Crawfish
Molluscs <i>includes snails, slugs, mussels, and octopuses. They have a soft unsegmented body and live in aquatic or damp habitats, and most kinds have an external calcareous shell.</i>	Curled Octopus	Razor Clams
	Quahog	Cockle
	Native Oyster	Periwinkle
	Limpet	Nudibranch/Sea Slug
	King Scallop	Horse Mussel
Other Invertebrates	Candy Stripped Flatworm	Sea Squirt



<i>Mixed group Worms, Sponges Cnidaria (pronounced Nidarian) Have stinging cells to catch prey and radial symmetry includes jellyfish and anemones Coral Echinoderms most have spiny skin and include starfish, sea urchins, brittle stars and sea cucumbers</i>	Sponges	Lug Worm
	Sea Anemones	Jellyfish
	Dead Man's Fingers	Brittle Star
	Sea Urchin	Cushion Starfish
Plants and algae <i>Many seaweeds are marine algae and although they can photosynthesize have different characteristics to most plants</i>	Kelp	Eel Grass
	Bladderwrack	Maerl

Choose species appropriate for your pupils.

You can add in others.



Once pupils have completed their species cards watch the Ulster Wildlife video [Our Living Seas](#) (17.42mins) and ask them to keep an eye out for their species in the video.

Encourage the pupils to read through and become familiar with the information they have found out about their species. The pupils should share what they have learned with the rest of the class. You may like to group pupils according to their classifications so that they can present together. Discuss the similarities and differences between groups. You may like to write up some of the words below to help with new language and add more as they arise.

For example;

animals	birds	molluscs	plants
vertebrates	fish	arthropods	photosynthesis
mammals	invertebrates	crustaceans	algae



Games

Something in Common: Instruct the pupils to move around the hall to try and find other animals or plants like them. Once they have found another similar species, they should continue looking for others together. For example, groups of birds, mammals, fish, plants, crustaceans etc.

Move if: The pupils start by sitting in a circle and play according to their species. Instruct the pupils to move to a new place when you call out something that relates to their species.

For example;

- Move places if you are an animal/ plant etc.

- Move places if you are an invertebrate/vertebrate
- Move places if you eat plankton/fish/seaweed/eel grass, etc.
- Move places if you live in the deep water/shallow water/sand/rocky shore, etc.
- Move places if you crawl/swim/float/walk/fly, etc.
- Move places if you are bigger than a dog/could fit in a cup, etc.

Name on the Head: Divide the pupils in to groups of about 6 to 8. Have them all switch cards without looking and stick their new card on to their head so that they cannot see but others can read the information. They should take it in turns to ask Yes or No questions about their species to help them guess what they are. If the answer is 'No' the turn moves to the next pupil until everyone has guessed.

For example

- Do I live in water?
- Am I a mammal?
- Can you find me in rock pools?
- Am I green?
- Do I eat plankton?

Use the pupils' information cards to create a display of the various species.







Marine Species Homework Task



In school we are learning about our local marine habitats and the exciting species that live there.



Use the internet to complete the card below about the species you chose, and we will use these for some fun and games in class.

Name	
Group	
Description	
Picture Draw or stick in a picture of your chosen species	
Habitat	
Food	
Interesting information	
Threats	

Suggested sites

<https://www.ulsterwildlife.org/explore/sea-life>

<https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/>

<http://www.habitas.org.uk/marinelife/>

<https://www.marlin.ac.uk/species>



Pupil Activity 2: Marine Habitats

Aim:

- To explore your local coastal area or tidal habitat.
- To understand that the marine habitat extends from the depth of the sea to the high tide and coastal reaches.

Prep

Download an image showing the various tidal zones for example <https://www.mba.ac.uk/fact-sheet-rocky-shore>

Create a large display board showing the different zones so that pupils can place their pictures of the species they find following their visit.

1. Share the image above with the pupils explaining the difference between the various zones. Explain that some species need to stay beneath the water whilst others can tolerate the zones between high and low tide where there are big fluctuations in moisture, salinity, wave motion and temperature.
2. Arrange a visit to the seashore to explore some of the different habitats present e.g. tidal pool, low and high tide zones. Before your visit show the pupils examples of the sorts of species they may encounter and familiarise them with the 'Golden Rules of Rock Pooling'. Bring notebooks and a camera to draw and take pictures of any species they find.
3. Back in the classroom use identification guides to name any species found and find out more about them. Collate your species on your display board.

JUST REMEMBER THE GOLDEN RULES OF ROCK POOLING;

- Always go with an adult
- Check the weather and tides, low tide on a good day is best but stay aware of incoming tides
- Gently touch the plants and animals, some rock pool animals can sting, bite and pinch
- Always carefully replace all overturned stones
- Do not pull seaweed off the rocks - it can take years to grow back
- If you take any shells home make sure they are empty first, you never know what might be lurking inside!
- Tread carefully to avoid slipping on the wet rocks
- Please take your litter home with you or put it in a bin
- Use an identification guide to help you
- Have fun



<https://www.nationaltrust.org.uk/features/rockpooling-guide-for-families>

Different Tidal Zones

Splash Zone is usually dry but exposed to spray and may be submerged in storms. It is inhabited by lichens, salt loving plants, and a few specially adapted animals.

Upper Shore is the area at the limit of high tide. It is wet during high tide and subject to increased wave action. It may dry out when the tide is out but tide pools and adaptations can provide some protection to inhabitants such as encrusting lichens, periwinkles, barnacles, limpets and channel wrack.

Mid Shore is the main tidal belt and is wet or dry depending on the tide. Organisms here must tolerate exposure to air and submersion in seawater and include: brown seaweeds called wracks, barnacles, crabs, limpets, mussels, anemones and some types of red and green algae.

Lower Shore is the lower limit of the tide and is usually wet. There is generally a greater diversity of animals and seaweed here due to more stable conditions e.g. kelp and red seaweeds.

Subtidal Zone is below the low tide mark and is home to more typically marine species including kelps, anemones, fish and many other organisms e.g. mackerel, jellyfish



Talk about the [Living Seas Video](#) they have watched previously.

Help pupils recall some of the different marine habitats in Northern Ireland mentioned e.g. rocky shores, sandy beaches, eel grass beds, coral reef, mud flats

These websites have more information on marine habitats:

<http://www.strangfordlough.org/projects/coastal-guardians.html>

<http://ccght.org/our-heritage/natural-heritage/biodiversity/>

Freshwater Biodiversity

Teachers' Notes

Our oceans are connected to all lakes, rivers and streams because all major watersheds on Earth drain to the oceans. Rivers and streams transport organisms, nutrients, salts, sediments and pollutants from watersheds to estuaries and to the ocean.

Rivers and lakes provide natural habitats for organisms including plants, fish, birds, invertebrates and mammals such as otters. All living things depend on one another for survival and all organisms in a food chain need to be protected.

Rivers support species depend on permanent running water, for example salmon and other fish need clean gravel on which to lay their eggs; stoneflies and mayflies depend on constant high oxygen levels, cool water and river mosses; the dipper, a small bird, relies on a constant supply of invertebrates for its diet. Pearl mussels, require near pristine freshwater habitats found in only the highest quality upland rivers.

Human activity such as pollution from discharges, runoff from agricultural land, sewage over flows and plastic pollution harms river habitats and the species found within. In addition, rivers act as a super highway carrying these pollutants to the sea. Many plants and animals simply cannot survive in these polluted habitats and unfortunately many species have already been eliminated, or their populations reduced. Protecting and cleaning up our freshwater habitats is an essential part of our work to maintain our planet's wellbeing.

Plastic Problems

Plastic pollution has a direct and deadly effect on wildlife in our rivers. Rivers and canals retain plastic pollution, but also act as conveyors, enabling plastic waste to reach our oceans.

Concentrations of contaminants in plastics are generally higher in fresh water because of its proximity to places where they are produced and disposed and are known to impair reproduction and development of freshwater species.

See more in the [Trouble with Plastics](#) section.

Do You Know?



The Freshwater Pearl Mussel is a critically endangered species. It used to be common in Northern Ireland but is now only found in six rivers including: the Ballinderry, Owenkillew, Swanlinbar and Special Areas of Conservation



The following species are found in and around Northern Irish rivers:

Otters, herons, dippers, kingfishers, freshwater pearl mussels, trout, salmon, crayfish, brook lamprey, eels, dragonflies, caddis flies, beetles, butterflies, moths

*

“Pollution from agriculture, over-abstraction and poor town planning are all factors threatening... extremely important habitat for wildlife”

RSPB



Pupil Activity 1: The Reel Thing

Aim: To gain an insight into our local river habitats.

Read the following abstract from John Todd's 'The Reel Thing' column (Irish News Columnist 28.02.19) and answer the following -

1. Why are many rivers in the countryside now more polluted than cleaned up rivers flowing through industrial towns?
2. What reasons can you give for the decline in the number of insects?
3. What power do you think the supermarkets have?

SALMON STOCKS ARE A REAL CAUSE FOR CONCERN

'Take a drive around the countryside and you will see relatively few cattle in our green fields and very few insects stuck to your windscreen compared to a few years ago.

The pesticides and chemicals involved with intensive farming are waving goodbye to our insects and invertebrates and where do you think the slurry from huge cattle sheds ends up?

A recent study in the north-west of England has shown that sections of famous rivers such as the Hodder and Ribble, which flow through the countryside, are now more polluted than cleaned up streams flowing through industrial towns.

Fly hatches such as Blue Winged Olives are now virtually extinct on parts of those waters. Is the same phenomenon occurring in parts of Ireland and, if so, can we stop it before there is more damage to fish stocks?

Maybe the agricultural sector needs more help and the supermarkets should have less power? We might need more river-watchers and better pollution regulations but, perhaps more importantly, the plight of so many salmon rivers is giving us a warning that we would be foolish not to heed, for both the salmon and our own health'.

Extract from John Todd 'The Reel Thing'



Ballinderry River, Co.Tyrone

Pupil Activity 2: River Biodiversity

All organisms need energy to live. When an animal eats a plant or other animal it gets energy from that organism, just like you get energy when you eat food. A food chain diagram shows this flow of energy.

1. The following species are common to our rivers. Match the names to the corresponding picture. Can you find any in your local river?
2. Draw a food chain showing the flow of energy in a river ending with you! e.g. algae – caddis fly larvae –

		HERON	SALMON
	KING FISHER		FRESH WATER PEARL
			
WHITE CLAWED CRAYFISH			
DIPPER	OTTER	BROWN TROUT	MALLARD DUCK
CADDIS FLY LARVAE	HUMANS 		

SCHOOL RIVER VISIT Contact: lovetolearn@ballinderryriver.org

Visit **Ballinderry River School and Conservation Breeding Centre** just outside Cookstown to learn about our precious rivers and loughs, the wildlife that call them home and how we interact with and depend on freshwater in our everyday lives.

Use **the river as an outdoor classroom** to learn how rivers change as they move through the landscape and the beasts and bugs that lurk beneath the ripples. **Or bring the river into your school** to learn how rivers change over time and even run your own breeding centre for trout in your classroom.

3. Create a classroom display of your local river habitat. Identify and label organisms, plants, fish, birds and any mammals.



Pupil Activity 3: Community Action Projects

Aim: To provide opportunities for pupils to take positive actions to protect biodiversity in rivers.

- Adopt a section of your local stream or river as an outdoor classroom and put in place a rivers action plan or go to Live Here Love Here and [Adopt a Spot!!](#)
- Promote the safe use and disposal of school and household chemicals and cleaning products by promoting the use of water friendly products.
- Join local river task groups to support tidy up days along the river by holding at least two action days per year.
- Collate information on your adopted river's wildlife and habitats and make it accessible for the general public in the form of a 'River's Atlas'.
- Develop child friendly information boards to access routes on themes such as wildlife, local history and river facts – hold a fundraising drive to do this.
- It is vital that we have strong environment and nature laws and policies. Lobby your local political representatives to ensure we protect our freshwater future for all.
- Investigate a local pond or build a pond in the school grounds for frogs and invertebrates. Even a mini pond can provide a good source of biodiversity to study.
- Celebrate World Water Day on 22nd March with a special assembly or other activity.



Download and watch the following power point on river pollution:

<https://www.twinkl.co.uk/resource/t2-g-3750-river-pollution-powerpoint->

Useful websites and local interest

- [wwf.org.uk/where-we-work/habitats/rivers-and-wetlands](http://www.wwf.org.uk/where-we-work/habitats/rivers-and-wetlands)
- Make a mini pond with the [rspb.org.uk/fun-and-learning/for-families/family-wild-challenge/activities/make-a-mini-pond](http://www.rspb.org.uk/fun-and-learning/for-families/family-wild-challenge/activities/make-a-mini-pond)
- Download and try out these river worksheets from [3dgeography.co.uk/river-worksheets](http://www.3dgeography.co.uk/river-worksheets)
- Contact the Loughs Agency <http://www.loughs-agency.org/education-outreach/> for education in the Foyle and Carlingford areas.

Global Perspective

Teachers' Notes

It is water that makes our planet unique in our solar system in its ability to support life.

Around 70% of the Earth's surface is covered by the ocean which produces most of the oxygen for our atmosphere and absorbs much of the carbon from it.

Though the exact number of marine species is unknown it is estimated to contain between 50-80% of life on Earth. The oceans influences weather and climate, shapes the features of the land and supplies a multitude of resources. Though mostly unexplored, the ocean is under threat from the catastrophic effects of pollution and climate change.

As the human population passes 7.5 billion, our careless use of the World's resources goes unchecked; our continued use of the ocean as a rubbish dump is now destroying marine species, poisoning our water and threatening our own existence.

Climate change, or climate breakdown, is also exacerbating the water crisis. It affects rainfall patterns and causes temperatures to rise, increasing storm events and altering the water cycle. This results in dry areas becoming drier and wet areas getting wetter. Rainfall patterns are at the same time becoming increasingly unpredictable threatening even those areas where overall water availability may be relatively good.

Climate breakdown is also causing sea levels to rise as the ocean expands due to higher temperatures. Water from glacial ice melt is disrupting the flow of rivers leading to devastating floods affecting millions of people around the globe.

Plastic Problems

Marine plastic pollution is a worldwide threat to the survival of many species including ourselves.

The plastic problem has been around for less than 100 years.

Humans have created the plastic problem.

Humans can fix it.

Humans must fix it.

See more in the [Trouble with Plastics](#) section.

Do You Know?



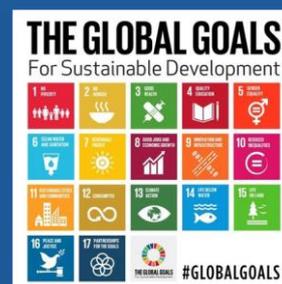
Climate change will result in millions of people being exposed to increased water stress. The poorest and most vulnerable people are most threatened, having less capacity to adapt to change and more dependence on local resources, food and water.

*

The term 'water conflict' is used to describe tensions or disputes between states, countries, or groups in relation to the utilization, consumption, or control of water resources.

*

World Leaders have developed [17 Global Goals for Sustainable Development](#)



Global Goals linked to the Marine topic are:

Goal 12 Responsible Consumption and Production

Goal 13 Climate Action

Goal 14 Life Below Water



Pupil Activity 1: Weather vs Climate

Aim: To help pupils understand the difference between weather and climate.

1. Ask the class how they would describe the climate to someone who has never been here before. Is it different in different seasons?
2. Display the question 'What is the difference between weather and climate?'. In small groups ask the pupils to discuss and feedback their answers to the rest of the class. Collate the answers and compare them to the following definitions.

Weather is what happens in the atmosphere at a given time. A place can experience more than one weather event in a day, and the weather is not the same everywhere.

Climate is taking the average and variations of weather in a place over many years.

Climate change caused by humans is a serious threat to our planet. Increased carbon dioxide in the atmosphere due to industrialisation has caused the average global temperature to rise by about 1°C in the last century.



Visit <https://vimeo.com/112042837> and watch the 'Climate Change Explained' animation (2:55)

3. In pairs ask pupils to do a KWL chart. Fill in 'what they know' and 'what they want to know' about climate change. After doing the activities in this section fill in the 'what they have learned' column.
4. Watch the animation again to reinforce learning. Discuss referring to their KWL chart.

Pupil Activity 2: The Great Water Debate

Aim: To critically challenge our perceptions of water and climate change.

1. Put up a large sign with 'Agree' on one side of the classroom and 'Disagree' on the other side of the room.
2. Ask students to gather in the middle and using the following statements students should move to one side or the other depending on how they feel about the statement.
3. Invite students to share their reasons for either agreeing or disagreeing with each of the statements. After listening to each other's responses invite them to either move again or remain steadfast!

- Humans can drink salt water
- We drink the same water that the dinosaurs drank
- There is plenty of water in the world for everyone to have enough
- We should have to pay to keep our water safe and clean
- Climate change doesn't affect us here in Northern Ireland
- I can't do anything about climate change



Pupil Activity 3: Celebrating Our Oceans

Aim: To know and understand the importance of oceans and the impact humans have on them.

1. Invite the class to brainstorm why oceans are important to us.

It is now recognised that we have one ocean with many basins which are all interconnected. <http://oceanliteracy.wp2.coexploration.org/>

Use the prompts below to help you.

Importance of the ocean

The ocean affects every human life. It supplies fresh water (most rain comes from the ocean) and half of Earth's oxygen. It moderates the Earth's climate, influences our weather, and affects human health.

The ocean provides food, medicine, and mineral and energy resources. It supports jobs and national economies, serves as a highway for transportation of goods and people, and plays a role in national security.

The ocean is a source of inspiration, recreation, rejuvenation and discovery. It is also an important element in the heritage of many cultures.

Everyone is responsible for caring for the ocean. The ocean sustains life on Earth and humans must live in ways that sustain the ocean. Individual and collective actions are needed to effectively manage ocean resources for all.

Human impact on the ocean

Laws, regulations and resource management affect what is taken out and put into the ocean. Human development and activity lead to pollution, changes in ocean chemistry (ocean acidification) and physical modifications (changes to beaches, shores and rivers).

In addition, humans have removed many of the large vertebrates from the ocean such as whales and sharks.

Changes in ocean temperature and pH due to human activities can affect the survival of some organisms and impact biodiversity (coral bleaching due to increased temperature and inhibition of shell formation due to ocean acidification).

Much of the world's population lives in coastal areas. Coastal regions are susceptible to natural hazards (tsunamis, hurricanes, cyclones, sea level change, and storm surges).

2. Celebrate **World Ocean Day** on June 8th. Visit <https://www.worldoceansday.org/> and download their educational packs to learn about the importance of our oceans. Oceans connect us all! There are videos, resources and lesson plans for all key stages including a '**Youth guide to the ocean**'



It's everybody's ocean, it's everybody's problem. (2.32 mins.)

<https://www.itseverybodysoceanmovie.com>

Find out more about the Sustainable Development Goals



Watch this World's Largest Lesson [video](#) (3 mins). It introduces the Sustainable Development Goals to the pupils all over the world in September each year.



What can I do?

Every one of us can make a difference. Here are just a few ideas: we can buy only **sustainably harvested fish**, we can reduce our **use of plastics**, and we can take part in **land and beach cleans**. We can learn more, spread the word and get involved.

Pupil Activity 4: Seashells on the Seashore

Aim: To know and understand what acidification is and its impact on marine species.

Ocean acidification is the ongoing decrease in the pH of the Earth's ocean, caused by the uptake of carbon dioxide from the atmosphere. Ocean acidification reduces the amount of carbonate, a key building block in seawater. This makes it more difficult for marine organisms such as coral and some plankton to form their shells and skeletons, and existing shells may begin to dissolve.

1. Take a selection of sea shells. Place an equal amount in a bottle/jar of water and the same in a bottle/jar of vinegar. Leave for a week.
2. After a week drain the two bottles/jars. Rinse and examine the shells.
3. What difference do you see between the shells in vinegar and the shells in water?
4. How does this relate to the oceans becoming more acidic?
5. How will this impact on marine life and on us?
6. Can you identify any solutions to the problem?

Ocean acidification will affect humans too! It will affect the food we eat since most of our shellfish requires calcium carbonate to form or to fortify their shells. Many of the fish we eat are also dependent on shelled animals for their food source, so the entire food chain is in jeopardy! The uncertain future of coral reefs due to ocean acidification is also a major concern. Healthy coral reefs provide food, coastal protection, medicines and attract tourism.

Useful websites

[The Other CO₂ Problem](#)

A short, powerful and entertaining animation on YouTube about the issue of ocean acidification, produced by Ridgeway School (Plymouth, UK) and Plymouth Marine Laboratory (www.pml.ac.uk). Funded by the European Project on Ocean Acidification (www.epoca-project.eu). (7.58 mins.)





Something Fishy

Teacher's notes

Fish and other seafood provide a nutritional source of protein in a healthy diet and are potentially a great renewable resource.

As human populations grow and the pressures on our oceans increase, demand for fish puts this valuable protein source under threat. Overfishing and unsustainable practices in many parts of the world are devastating marine populations and ecosystems. This prevents stocks from recovering and can eventually wipe out whole species. If too many larger predator species are caught the balance of the ecosystem is disrupted and smaller species of fish may become too abundant, eventually out-competing other species. Careful management is required to make sure wild fish stocks aren't over-exploited.

Certain fishing practices such as dredging and the use of heavy bottom trawls scar the seabed, damaging fish and shellfish habitats. Though fish farming (aquaculture) is rapidly expanding to meet increasing demand for seafood, if done badly it also damages the environment affecting wild species.

Climate change and ocean pollution contribute to the pressures on both wild and farmed stocks.

Consumers can help by making more environmentally responsible choices when buying seafood.

It is essential that action is taken to preserve our vital ocean resources.

bycatch	overfishing	aquaculture
The unwanted fish and other marine creatures trapped by commercial fishing nets during fishing for a different species.	Is the removal of a species of fish from a body of water at a rate that the species cannot replenish in time, resulting in those species either becoming depleted or very underpopulated in that given area.	The rearing of aquatic animals or the cultivation of aquatic plants for food.

Plastic Problems

Microplastics which are tiny pieces of plastic are not only found in the guts of fish and shellfish but also carry pollutants into their tissues, affecting their reproductive rates.

Experts estimate that by 2050, the amount of plastic in the ocean will weigh more than the amount of fish in the ocean.

See more in the [Trouble with Plastics](#) section.

Do You Know?



90% of global fish stocks are either fully or over-exploited.

*

Millions of non-target sea creatures or bycatch (such as dolphins) are accidentally killed each year by being caught unintentionally in fishing gear.

*

Around 70% of the human population live within 60km of the sea and rely on it as an important food source.

*

Farmed salmon that are released or escape can pass on diseases and parasites to wild fish.



In the UK alone we consume £5.7 billion worth of fish and seafood products every year, imported from more than 85 countries.

*

In the UK, cod was traditionally used in fish fingers but as a result of heavy demand, the cod fisheries collapsed.

Global stocks have declined by 70 % in the past 30 years.

Pupil Activity 1: What's on Your Plate?

Aim:

- **To recognise and learn about common marine species in our diet and explore the impact of overfishing and other marine threats.**

Prep: Print and cut up copies of the Fish and Seafood cards, enough for 1 set of cards per small group.

1. Ask pupils if they ever have fish or seafood for dinner and if they can name any that they consume. Record their answers on the board or ask them to draw any they know and refer back to this at the end of the lesson to see how much they have learned.
2. Distribute the cards to small groups of pupils and ask them if they can try and match the picture to the name and description of each common species we find on our plates.
3. Visit your local fish counter or market and see if you can spot any other species. Allow pupils to use the internet to create other clue cards.
*Be aware of any vegetarian, vegan or other pupils who may not consume fish.
4. Divide the class into groups, assign to them one of the species listed and allow them to use the internet to find out about them.

Pupils Activity 2: Sea to Plate

Aim:

- **To help pupils understand the impact of unsustainable fishing.**
- **To highlight the benefits of locally caught and sold fish and seafood.**

Prep: Download video clip and copy one set of cards for supply chain activity.



Watch the story of a fish finger- [‘Supervalu’ A look at food miles and food waste](#) (5 mins.)

1. Discuss the different steps in bringing the fish finger to the table. How did you feel when the child didn't eat them and they ended up in the bin?
2. Invite 8 pupils to come to the front of the class and ask them to hold, in order, the fish supply chain cards.
3. Explain the different stages (See cards below).



At each stage ask pupils to think about the energy involved in catching, processing, handling and transporting the fish from the sea to plate. Explain that much of our fish and seafood comes from overseas and therefore has very large distances to travel in expensive refrigerated containers.

Think about the fuel consumed for travel and refrigeration and the energy used in processing, packaging etc. Also consider time spent at sea, labour costs, risks, etc. You could record all these factors on the board.



Consider wastage: bycatch i.e. fish and other creatures unintentionally caught in fishing gear, fish thrown back because they are too small to meet regulations etc.; wastage in processing and handling; as well as that which goes beyond best before dates or is simply not eaten and thrown away.

- Northern Ireland has a thriving fishing industry but only a small percentage is sold locally. What happens to our supply chain if we catch fish locally using small vessels which fillet the fish and sell locally in smaller shops or through the fish van or local market? Can you take away any of the steps in the supply chain and reduce the energy required to get fish to your plate?



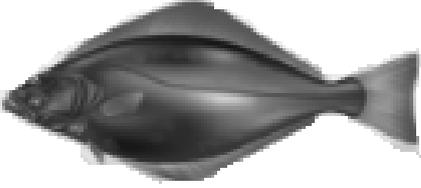
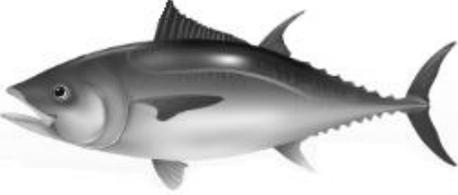
- Have a look at the [Marine Conservation Society Good Fish Finger Guide](#) to rate your usual brand.
- Develop a list with pupils to think about how we can change and share with others in school and at home.

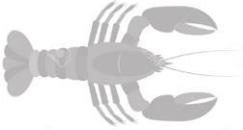
HOW CAN WE DO BETTER?

- Buy only as much food as you eat. Waste less food and don't let it end up in your bin.
- Buy fish and seafood that is locally sourced with minimal packaging. Rather than buying produce flown in from Thailand head to your local market to buy fish and seafood caught more locally. Your locally-caught fish will be fresher and will not only taste great but is better for the planet as well.
- Look out for and request sustainably sourced fish and seafood products.
- Use energy-efficient food storage. Get an energy efficient refrigerator, and keep it fully stocked. It works most efficiently when it's full.
- Think of ways to spread the message of sustainability, with politicians, communities, businesses and consumers to build consensus on managing fisheries for the long term.
- Choose the Blue Fish Label. Check out the [Marine Stewardship Council](#) or the [Marine Conservation Society](#) good fish guides to find out more about sustainable sources of fish.

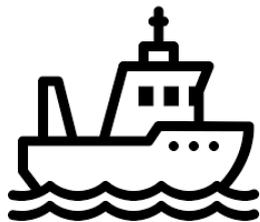


Fish and Sea Food

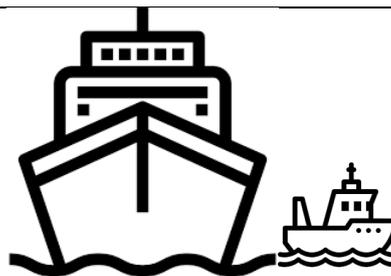
	<p>Atlantic Cod</p>	<p>Due to demand there has been a massive decline in their numbers.</p> <p>They are carnivores.</p> <p>Individuals have been known to grow up to 2 metres, 100 kg and live up to 20 years.</p> <p>Caught commercially 5-12 kg.</p> <p>Clue: Popular white fish especially with chips.</p>
	<p>Atlantic Halibut</p>	<p>One of the largest flatfish in the world and can be as long as 2.5 metres, weighing up to 300 kg and living up to 50 years.</p> <p>Clue: They live on the sea floor.</p>
	<p>Salmon</p>	<p>Incredible fish that migrate thousands of miles from saltwater to freshwater habitats to breed.</p> <p>These can grow to about 70-80 cm and live 2-5 years on average.</p> <p>Clue: This popular fish is often smoked, baked and even tinned.</p>
	<p>Tuna</p>	<p>They can reach the speed between 44 and 62 miles per hour. Numbers have decreased by over 90% percent since the beginning of 20th century.</p> <p>Clue: Often tinned or served as steaks, good in a pasta bake!</p>
	<p>Mackerel</p>	<p>These fish swim in large schools that can stretch up to 20 miles long.</p> <p>About 30-40 cm in length they are fast and agile.</p> <p>Clue: This oily fish can be a bit bony but is often served really fresh or smoked.</p>

	<h2>Sardines</h2>	<p>These small, silvery elongated fish have a single short dorsal fin. They range in length from about 15 to 30 cm and live in dense schools, feeding on plankton. They are a really important part of the food chain and eaten by many bigger species.</p> <p>Clue: Commonly found in a tin maybe even with tomato sauce!</p>
	<h2>Lobster</h2>	<p>This large crustacean has a hard exoskeleton, jointed body, big claws and long antenna. It is believed they can live as long as 100 years.</p> <p>Clue: This luxury seafood is often trapped in 'pots' off rocky coasts.</p>
	<h2>Squid</h2>	<p>These creatures have sharp beaks and toothy tentacles. They can change colour for camouflage and signalling. They are eaten by other animals.</p> <p>Clue: To cook cut this into flat pieces or slice into rings; even the arms, tentacles and ink are edible.</p>
	<h2>Prawn</h2>	<p>This smaller crustacean has five pairs of legs and long antennae. They are an important source of food for many crabs, fish, sea urchins, whales, dolphins, and seabirds. An important part of the ecosystem these omnivorous little creatures can be found in tidal pools.</p> <p>Clue: Crackers or cocktails!</p>
	<h2>Blue Mussel</h2>	<p>These live on rocky, sandy or muddy shores. They fix themselves to rocks using special threads or "beards". They feed entirely on plankton by filtering up to 65 litres of water a day. Though they can accumulate harmful chemicals and plastics in their tissues, making them a good indicator of the health of our seas.</p> <p>Clue: Can be eaten straight from the shell. They might give you strength!</p>

Please note sizes given are for wild specimens caught in the wild. Farmed and commercial stock will be different.



Fish caught by smaller fishing boat



Fish transferred to a larger offshore vessel



Fish processed and packaged



Fish transported to market



Fish products on sale



Fish bought by consumer and transported home



Fish eaten



Wastage



The Trouble with Plastic

Teachers' notes

The first oil based commercial plastic was invented in 1907. Plastics are incredibly versatile and have millions of uses in everyday life, indeed they are all around us. But their disposal creates many problems and the challenge of plastic pollution in the sea is having dire consequences for our planet.

Many marine organisms can't distinguish common plastic items from food. Animals that eat plastic often starve because they can't digest the plastic and it fills their stomachs, preventing them from eating real food. Microplastics, (plastics smaller than 5mm) absorb toxins which can build up in the cells of animals throughout the food chain, including us.

Cleaning up plastics that have already reached our seas is a huge challenge. Preventing new plastic entering the sea and encouraging alternatives is the testing task ahead.

There are many excellent educational resources on the challenge of marine plastics. [Plastic Oceans](#) resource is comprehensive and highly recommended.

Plastic Problems

More than 8 million tonnes of plastic enter the world's oceans each year and most of that escapes from land.

Plastics have collected in ocean gyres creating huge areas of floating plastics. The Great Pacific Garbage Patch is the largest of the five offshore plastic accumulation zones.

Plastic does not biodegrade it just breaks down into smaller and smaller pieces creating a microplastic 'soup' which makes it even harder to clean up.

Plastics are found in the ocean from the shores to the depths.

You may like to write up and research some of the words below to help with new language – you can add more as they arise.

For example;

gyre	biodegradable	microplastic
nurdle	compostable	microbead

Do You Know?



The Great Pacific Garbage Patch is estimated to be about 10 times the size of the island of Ireland.

*

Sea turtles caught by fisheries operating within and around this patch can have up to 74% (by dry weight) of their diets composed of ocean plastics.

*

Virtually all the plastic ever made still exists.

*

Each year, 400million tonnes of plastic is produced and 40% of it is single use – plastic we'll only use once before it's binned.

*



82% of litter on Northern Ireland beaches is plastic.

*

For every 100 metres of beach cleaned along our coast, volunteers collected on average 100 pieces of general plastic and 47 pieces of string, cord and rope.

*

Pupil Activity 1: Exploring the Plastic Problem

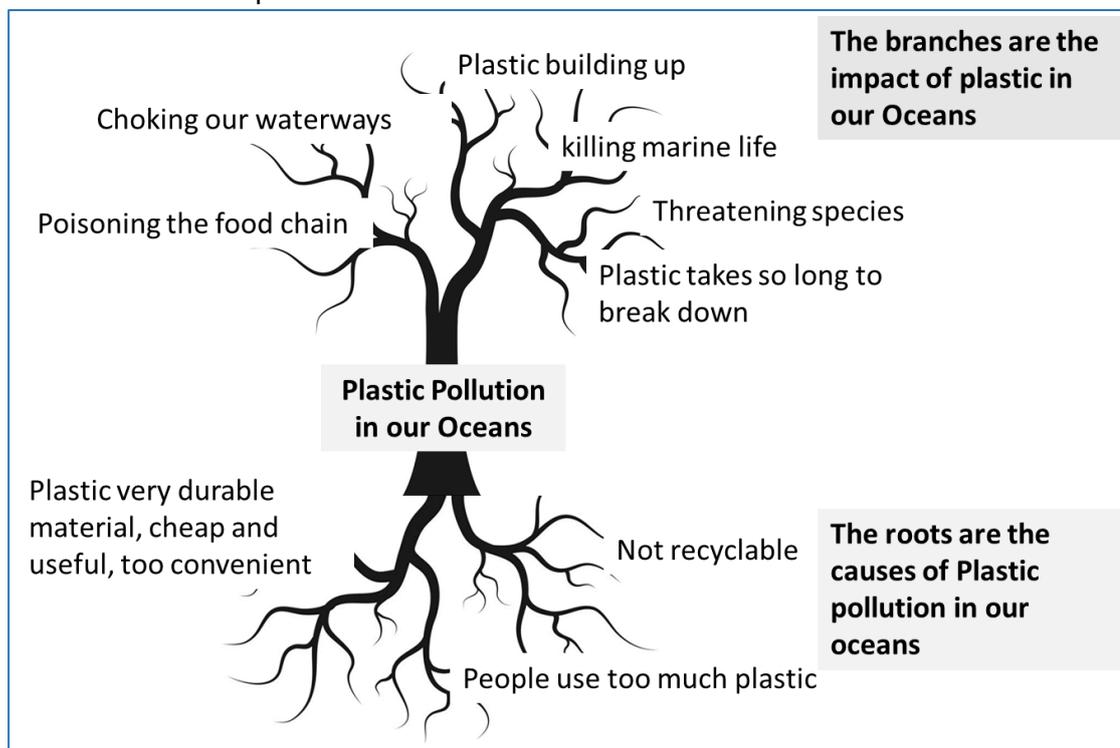
Aim: To help pupils understand the impact of plastic on our planet, especially marine environments.

Discuss with the pupils their experience of plastic in the sea, on the beach, in local rivers.

 Watch the video [How We Can Keep Plastics Out of Our Ocean | National Geographic](#) (3.10mins) and/or [A Plastic Ocean Official Trailer](#) (2.08mins)

1. Ask pupils how they feel after watching the videos.
2. What stood out for them from the video clips?
3. As a class explore the problem of plastic in our oceans further by using the **problem tree** approach to explore both the impact of plastic in our seas and the root causes

Problem tree example:



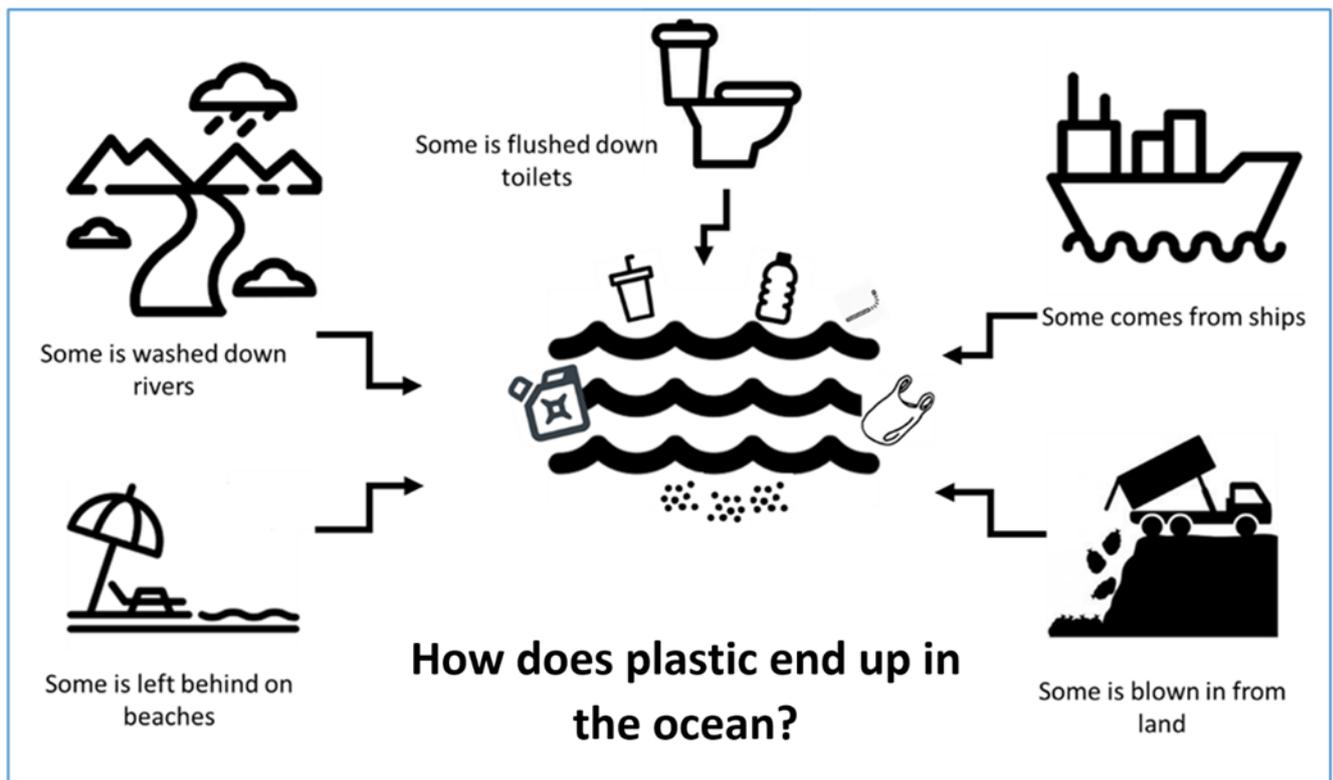
4. In groups ask pupils to explore possible solutions to this problem. They could then present these to the rest of the class.

Pupil Activity 2: Routes to Sea

Aim: To help pupils understand how plastic reaches the sea and the impact it has on the marine ecosystem.

 Watch [Why plastic is a problem](#) (2.29min) and discuss:

1. **How did they feel seeing all the plastic floating in the sea? What did they think when you saw the whale trying to eat the plastic bucket?**
2. **Can they name any plastic items mentioned?** For example, food wrappers, cups, straws, bottles, bags, disposable items. Explain that many of these things are called single use plastics as they are only used once then thrown away.
3. **Where is plastic found in the sea?** On every shoreline to the depths of the oceans.
4. **How does plastic end up in the sea?** You can use the diagram below to remind them.
5. Challenge pupils to spread the message about protecting our oceans from plastics by encouraging others to **rethink, refuse, reduce, reuse and recycle** and of course to lead by example. Develop posters, presentations or social media messages they could use for a campaign to reduce single use plastic pollution.



Good news

Look at steps already being taken

- The Government has promised to cut all avoidable plastic waste over the next 25 years

- Many groups and organisations are working hard to tackle the issue.
- The 5p charge for plastic carrier bags has reduced the amount we use by over 80%.
- Some hotels, cafes and restaurants are only giving out straws if people ask for them and some are swapping them for paper alternatives.
- [The UK has decided to ban plastic microbeads in products like face scrubs and toothpaste.](#)
- [In Norway a plastic bottle return schemes allow people to get money back when they recycle them](#) - it is hoped this could be adopted in the UK.
- Plastic bags are illegal in Kenya. There are fines for using them and possible prison sentences for making or importing them.
- [An invention to help clear up floating rubbish in the Great Pacific Garbage Patch is under development.](#)
- Supermarkets and food producers are being encouraged to make recycling their packaging easier or even go plastic free.

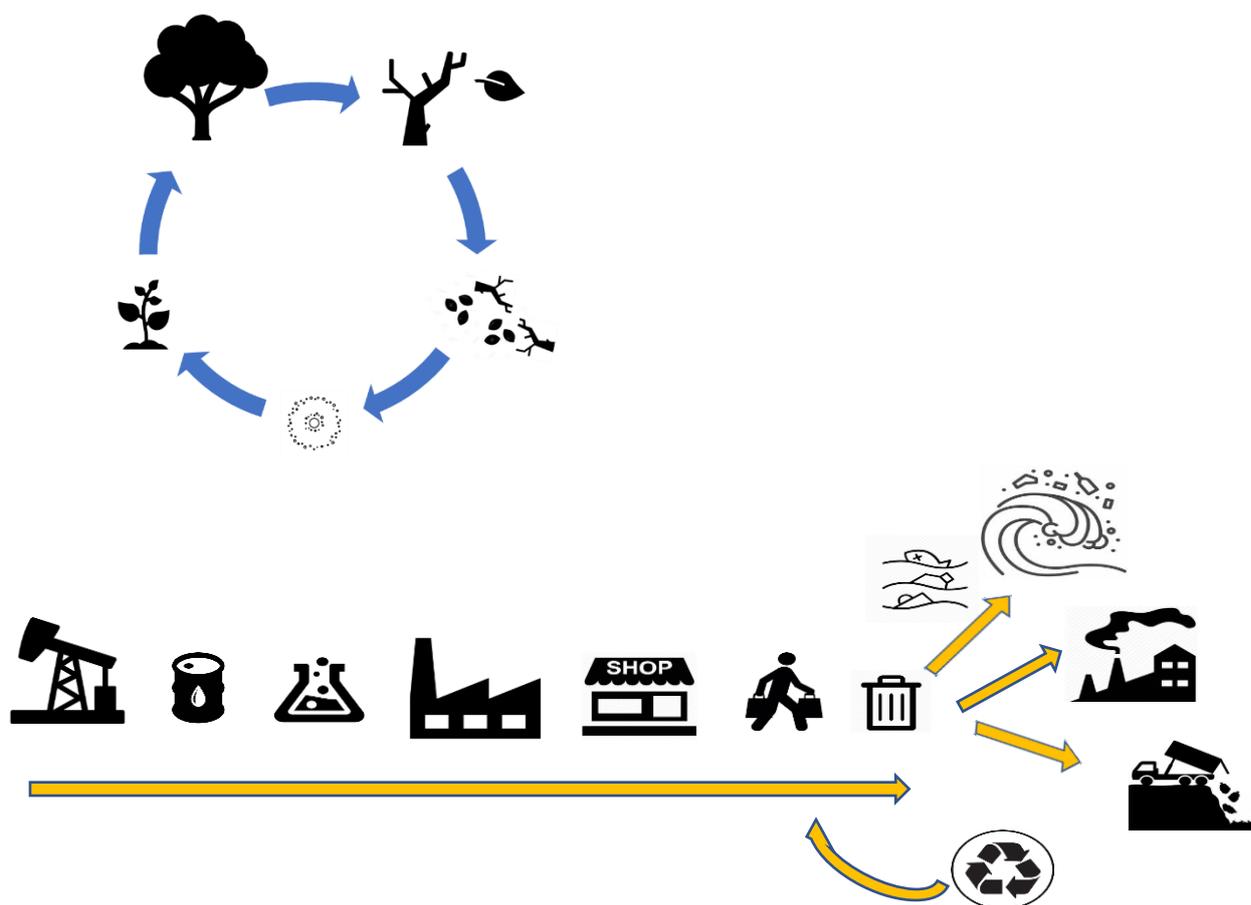


Pupil Activity 3: Single Use Plastic

Aim: To help pupils identify plastics, especially single use plastics, in their everyday lives and to encourage commitment to reducing single use plastics both at home and in school.

 Watch the BBC Plastic Watch video clip [How did we get to a world full of plastic? – BBC \(2.03mins\)](#)

1. Discuss the usefulness of plastic and why it is such a popular material.
2. List some of the properties of plastic which make it so useful e.g. mouldable, flexible, waterproof, indestructible,
3. Help pupils understand that the very reason that plastic is so useful has led to the difficulties in disposing of it.
4. Contrast the circular life cycle of compostable natural materials with the linear way in which we use plastics. The problem with plastic is it isn't biodegradable. It doesn't rot, like paper or food, so instead it can hang around in the environment for thousands of years.



5.  Watch [What really happens to the plastic you throw away](#) – (4.06mins) Discuss the different routes the bottles take. Note that even if recycled the bottle still only had a very short useful lifespan.
6. Ask the pupils to look around the classroom and identify objects that are made of plastic.

7. Help the pupils identify single use plastics in school such as straws, bags, cups, sandwich bags, glitter etc. Explain that changing behaviour in relation to single use plastics is a very helpful step along the way to tackling plastic pollution.



Set the pupils the homework task to identify single use plastics in their home and discuss alternatives with their family using the homework sheet below.

Take Action

Take the Live Here Love Here Pledge and reduce single use plastics in school and at home.

Visit [Live Here Love Here website](#) to find out more..

Clean a beach

Join a beach or river clean up in your local area or organise your own. An up-to-date list is available on the [Live Here Love Here](#) website. List items that you find – use the data for classwork i.e. make a bar chart of your results.

Investigate beach sand

Collect some sand from near the tide line and take it back to school to look at under the microscope. What is it made of? Can you see any tiny microplastics?

School action on plastics

Audit the plastic being used in your school – how much of it is actually recycled? See the Eco-Schools Waste Data Zone for audit ideas.

Create a campaign to discourage the use of single use plastics in school including items such as straws, glitter, chewing gum, sandwich bags and plastic disposable bottles etc.

Find out how other schools have reduced their plastic usage and waste and encouraged others to do the same. Watch [CBBC Meet the plastic-busting Eco Crew](#) (1.29mins) and learn about plastic free schools.

Some charitable activities can involve purchasing plastic novelties to raise money e.g. badges, balloons, bracelets, toys, etc. Try raising money without getting the plastic extras. See how one [School celebrated Comic Relief without the plastic Red Noses](#).

What can you do?

Say YES please to:

- Refillable water bottles or flasks
- Reusable shopping bags
- Reusable lunch boxes or wrappers instead of plastic throwaway sandwich bags

*

Say NO thank you to:

- Black plastic - it cannot be picked up by recycling machines and ends up in landfill
- Plastic straws (ask for paper, metal or bamboo alternatives if you really need one)

*

Encourage others to:

- Use loose leaf tea (tea-bags contain plastic!)
- Buy loose fruit and veg
- Change to bamboo toothbrushes and eco-friendly cotton buds
- Choose bars of soap and shampoo instead of liquid versions – you use less and no bottle is required
- Take tubs and containers to the market or shops to bring home your supplies
- Look out for recycled plastic if you do need it and ensure you do recycle where possible
- Put pressure on businesses and political leaders to act on plastic pollution
- Only put the 3 Ps down the loo! Poo, Pee, and (toilet) Paper

Exploring alternatives

Use the internet to check out innovative plastic alternatives made from corn starch, grape skins, milk, fungus, bamboo and wood, etc. You can even try [making your own plastic using milk and vinegar](#) and test its properties and how long it takes to break down.

Encourage others

Write letters to businesses, local leaders and groups or clubs asking them about their environmental policies and any plans to tackle plastic pollution. Praise them for any innovations but encourage more action. Share your ideas and lead by example.

Learn from others

Use the internet to learn how others have transformed plastic waste into all sorts of useful things such as furniture, greenhouses and eco-bricks, and even beautiful items such as original artwork, jewellery, sculptures and collage. Then try it yourself.

So, while there is no silver bullet for making plastics “green”, a combination of revitalizing old ideas and revolutionizing plastic technology are steps in the right direction.

Other useful video clips

- [Plastic 101 National Geographic](#) (6min)
- [Sir David Attenborough's plastic message](#) – BBC (2.48min)
- [It's a Plastic World](#) more suitable for KS3 (4.39min)



Complete the table below in relation to these ten common items found on NI beaches

	Estimated time the plastic was used for (seconds/minutes)	What did we use before plastic?	What are the alternatives? What could we use or do instead?
1. Plastic bags 			
2. Bandages/ plasters 			
3. Cotton buds 			
4. Baby wipes 			
5. Drinks cans 			
6. Plastic bottles 			
7. Crisp, sweet, sandwich and lolly wrappers 			
8. Fast food containers 			
9. Plastic straws 			
10. Disposable cups and lids 			



Single Use Plastics Homework Task



In school we are learning about the problem of single use plastics and the impact they have on our marine environment.

Look around your home	Tick if present	Tick if these can be recycled	Have you any ideas how you could reduce your usage of these single use items?
Plastic bags 			
Bandages/ plasters 			
Cotton buds 			
Baby wipes 			
Drinks cans 			
Plastic bottles 			
Crisp, sweet, sandwich and lolly wrappers 			
Fast food containers/sandwich bags 			
Plastic straws 			
Disposable cups and lids 			



In school we are learning about our marine environment and how to protect it.

In 2015, world leaders agreed to 17 goals for a better world by 2030. These goals have the power to end poverty, fight inequality and stop climate change. Guided by the goals, it is now up to all of us, governments, businesses, civil society and the general public to work together to build a better future for everyone.



Global Goal 14 Life Below Water aims to 'Conserve and sustainably use the oceans, seas and marine resources for sustainable development'

Global Goal 12 Responsible Consumption and Production aims to 'Ensure sustainable consumption and production patterns.'