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How clean are our seas?

Sustainability Goals:



Subject links:

Science, Geography, Citizenship,
English

Ages 5-7

Curriculum key words:

Human impact, topical issues, environment, UK wildlife,
group work, reading

Ocean Literacy Principles:

1. The Earth has one big ocean with many features.
4. The ocean made the Earth habitable
5. The ocean supports a great diversity of life and ecosystems
6. The ocean and humans are inextricably interconnected

Learning objectives:

- To begin to learn how important the ocean is to all life on earth
- To understand how litter in the ocean can harm wildlife
- To summarise learning and be able to communicate what they've learnt effectively

Resources provided:

- [Marine Litter Fact File](#)
- [What did the ocean ever do for us? \(video\)](#)
- [Marine Litter Image Reel](#)
- [Tuamor the Turtle](#)
- [Curriculum links](#)

Extra resources required:

Computers (for extension activity)

Step 1

Background

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 down into smaller and smaller pieces which can be mistaken for plankton or other food sources. Completing this lesson will give students an overview of the marine litter problem.

Step 2

Set the scene

10 minutes – Why is the ocean important?

Watch the video [What did the ocean ever do for us?](#) as an introduction to why the ocean is so important. Discuss the video as a class, reviewing the main points raised in the video and considering the need to keep the ocean clean and healthy.

Step 3

Activities

Activity 1: 10 minutes – What is marine litter?

Write the words 'marine litter' on the board and ask students to discuss in pairs if they know what they mean. Define the terms as a class, then ask pairs to think about what they may already know about the subject, thinking about what they may have seen on the news or TV.

Next, have a class discussion for students to share what they talked about and add notes to the board. Use the [image reel](#) to illustrate topics in the discussion, and the [Marine Litter Fact File](#) for more information.

Activity 3: 10 minutes – How are animals affected by litter?

Focus on how marine animals are affected by litter by using the slide titled 'marine life and marine litter' in the [image reel](#). As a class, identify the animals and the types of litter in the illustration. Discuss how the animals might be affected by the litter, and how the items could affect which animal. Show images on page 4-5 of the image reel to discuss this further.

Activity 4: 20 minutes – Reporting on our ocean

Using the information learnt in activities 1-3, students could perform a short Newsround-style report on the issue to inform others, or they could create a news article for your school's website.

Step 4

Extend

30 minutes – Tuamor the Turtle

As a class, read [Tuamor the Turtle](#), a story about a tiny turtle in the Pacific Ocean that takes on the might of plastic peril, helped by two children: Abbie and her younger brother Charlie. The story complements the learning in this lesson plan.

Step 5

Reflect

5 minutes

Why is it important to keep the ocean healthy and clean? Why is plastic in the ocean bad? How does marine litter affect animals?

Step 6

Follow up

This lesson is the second in a series of lessons on marine litter. The next lesson in this series, [Travelling from source to sea](#), focuses on how marine litter finds its way to the ocean.

The lesson, [Taking action on litter](#), focuses on what we can do to reduce litter in our community.

Curriculum links

England

Science

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

Citizenship

- 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 learn about some of the ways people look after them.

English

- Develop pleasure in reading, motivation to read, vocabulary and understanding.
- Understand both the books they can already read accurately and fluently and those they listen to.
- Participate in discussion about what is read to them, taking turns and listening to what others say.
- Explain clearly their understanding of what is read to them.

Wales

Humanities

- I can describe how people and the natural world may impact on each other.
- I can take care of resources and not waste them, and I am conscious of the importance of creating a sustainable future.

Science

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

Languages, Literacy and Communication

- I can enjoy sharing books and reading materials and handle them like a reader.
- I can respond to what I hear, read and view and can express simple opinions on it.
- I can respond creatively to the range of literature I hear, read or view.

Scotland

Social sciences

- I explore and discover the interesting features of my local environment to develop an awareness of the world around me.
- I explore and appreciate the wonder of nature within different environments and have played a part in caring for the environment.

Science

- I can talk about science stories to develop my understanding of science and the world around me.
- I have contributed to discussions of current scientific news items to help develop my awareness of science.

Literacy and English

- To help me understand stories and other texts, I ask questions and link what I am learning with what I already know.
- I enjoy exploring events and characters in stories and other texts, sharing my thoughts in different ways.

Marine Litter Fact File



From source to sea

It is estimated that 11 million tonnes of plastic ends up in the sea worldwide each year (1), and that 80% of litter found in the sea is from inland sources (2).

Sources on land can include intentional and accidental littering, items flushed down toilets, sinks and drains, windblown litter from bins and landfills, and litter carried by rainwater into drains, rivers and eventually the sea. Litter is also a problem at sea, with sources like fishing, sailing, speed boats, commercial ships and container spills causing litter pollution.



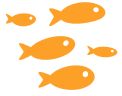
Litter timeline

Litter in the ocean takes longer to degrade than litter on land, but will eventually start to break up due to wave action, currents, saltwater and sunlight. Degradation time varies greatly depending on the properties of the litter.

Microplastics are a serious environmental issue. They are plastics that have broken up into pieces less than 5mm. However, some plastics enter the environment this size already - like microfibres and plastic nurdles. Nurdles are the small plastic pellets used in the production of plastic products.

1. Pew, 2020
2. Europa, 2016

Marine Litter Fact File



Marine life and litter

Litter items can cause harm to all sorts of marine life, from tiny plankton to huge whales.

Animals can become entangled in litter, causing injury, reduced mobility and even death. Ingestion of litter, particularly plastic, is very problematic for marine life as they are unable to digest it. Large amounts of plastic ingestion can lead to starvation, as there is no room left for food. One study found 100% of turtles sampled to have plastic in their stomach (3). In some areas, the extreme amount of plastic on the sea floor can suffocate the animals and plants living there.

Invasive species

Ocean currents can move plastics around the world. Small animals and plants can hitch a ride on the surface of plastic and travel with the currents, introducing non-native species to new areas. The introduction of non-native species could cause harm to the ecosystem.

Plastic chemicals

Several chemicals used in the production of plastic materials are carcinogenic. Toxic contaminants can also accumulate on the surface of plastic materials that have broken up and been underwater for a long time. When marine animals ingest plastic accidentally, these toxic contaminants enter their digestive systems and could build up in the food web over time.



Gannet carrying fishing rope
📷 JHS Archer-Thomson



Microplastic pieces within seaweed
📷 Natasha Ewins

Marine Litter Fact File



Litter surveys

Litter surveys are not only important for clearing rubbish, but also for gathering data on the types of litter polluting our environment. [Beachwatch](#) is our national beach clean and survey initiative, and has been running for nearly 30 years. Our brilliant volunteers head out to beaches across the UK to clean and survey our coastline, collecting and recording the rubbish they find within a 100m stretch of beach. This litter data helps inform our campaigns and lobby government, and has led to influential changes like the UK-wide carrier bag charge, microbead bans and changes to wet wipe packaging.

We also use the data to determine the sources of litter. For example, if a significant amount of sewage-related debris (SRD) is found in an area, we work with local sewage treatment companies to try to improve treatment plants, and with communities to raise awareness of what should and shouldn't be flushed down the toilet.



Reducing litter

We all need to do our bit to reduce litter in the environment. By rethinking how we shop and what we use in our daily lives, we can all make a difference. Refusing unnecessary plastic and other materials, reducing the amount of products we consume, and repairing rather than replacing are all important actions we can take. Through education, we can help raise awareness, encourage positive consumer behaviour, and campaign for change from businesses and the government.



© Natasha Ewins



© Aled Llywelyn

Marine Litter Fact File



Recycling

Even if we reduce the number of items we use, we will still need to throw some away. This is where efficient recycling is key. Download a guide from your local council to help students understand what can be recycled at home and at school. Many items can be recycled, but if your local council has limited recycling options check out [Terracycle's website](#) for local drop-off points.

Plastics can only be recycled at best 2-3 times before they lose their strength, so we still need to move away from plastics to materials that can be recycled time and time again. We need to change how products are recycled, and how we incentivise best practice to ensure materials and resources are valued. This could include redesigning products or calling for economic incentives like Deposit Return Schemes (DRS), where a small deposit is paid when consumers buy a single-use drinks container and is refunded when they return it to a store or dedicated recycling point.



Circular economy

We currently have an economy which is linear, which means we make, use and dispose of products using up finite resources. It's estimated that only 9% of all plastic ever made has been recycled (4), so we know that recycling alone isn't the solution. Instead we need to move towards a circular economy, where products are designed to be used time and again, repairable, or re-purposed as new products. The whole life cycle of the product has been considered, so very little ends up in landfill.



Litter collected at a beach clean
📷 Natasha Ewins



Single-use plastic straws
📷 Natasha Ewins

4. Geyer *et al.*, 2017