



MARINE
CONSERVATION
SOCIETY

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From Source to Sea

Sustainability Goals:



Subject links:

Science, Geography, Citizenship,
Maths, ICT

Ages 7-11

Curriculum links:

Human impact, Topical issues, Digital skills, Maps, Data,
Statistics, Community, Environmental responsibility

Ocean Literacy Principles:

6. The ocean and humans are inextricably interconnected

Learning Objectives:

- To develop map reading skills through studying how where you live connects to the ocean
- To begin to understand what happens to litter after it has been used
- To interpret and analyse data by looking at beach clean results

Resources provided:

- [Marine Litter Fact File](#)
- [Your School and the Ocean](#)
- [Marine Litter Image Reel](#)
- [2020 Beach Clean Results](#)
- [Beach Clean Data worksheet](#)

Extra resources required:

- Computers with Google Earth
- Maps of local area

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. More info in [fact file](#).

Completing this lesson will give students an overview of marine litter. It's estimated that 80% of litter in the ocean comes from inland sources, showing that no matter how far we live from the sea, our actions can affect marine life.

Step 2

Set the Scene

20–30 minutes – How does my school connect to the sea?

Explain that the lesson is going to focus on how litter travels to the sea. To do this, you are going to find out how your local area is connected to the ocean.

First use Google Earth to find your school. From your school, locate the nearest river and explore where this meets the sea. At each stage, fill in the [Your school and the ocean](#) worksheet. There are different worksheets depending on whether students are completing the activity [in pairs](#) (recommended for older students) or as a [class activity](#) (younger students).

Step 3

Activities

Activity 1: 20–30 minutes – From source to sea

As a class, have a look at the slide titled 'Sources' in the [Marine Litter image reel](#). Ask students to share their ideas of how each symbol is connected to litter. Discuss how litter items could travel from source to the sea using the icons as inspiration for discussion.

Using printed maps of the local area, students should work in pairs to identify possible local sources of litter, including businesses, communities and natural features in the area. These could be schools, hospitals, houses, shopping centres, farms, streams, rivers and more.

Activity 2: 15–20 minutes – Beach Clean Data

The Marine Conservation Society organises beach cleans to record the types of litter found at the coast. We use this data to help raise awareness of marine litter and to campaign for change from consumers, businesses and the government.

Students should analyse and interpret the [2020 Beach Clean Results](#) and use the [Beach Clean Data worksheet](#) to record their analysis. Those finished first could answer question 4. (a–d) for another litter item from the top ten.

Step 4

Extend

30–45 minutes – Raising awareness in your community

In small groups, students should create a campaign around one of the top ten litter items found on our beaches. The campaign should focus on raising awareness of the problem in your local area. Thinking back to the map activity, are there any local businesses or community groups that might use this item? Think about what changes could be made to reduce the amount of this item found in the environment. You could make this activity a competition, with the winning group presenting their campaign at an assembly to the rest of the school.

Step 5

Reflect

5 minutes

How is your school connected to the ocean? Can you remember one way litter reaches the ocean? What are the top three items found on beaches? How could we reduce the amount of litter in the sea?

Step 6

Follow up

5 minutes

Our [Plastic Plague](#) lesson focuses on sorting litter items by their materials and properties, and includes a degradation experiment.

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.



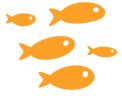
Litter timeline

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 from 1–450 years 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, as well as pieces that enter the environment this size like microfibres or plastic nurdles, which 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 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 who 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 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 amongst
seaweed. © Natasha Ewins

Marine Litter Fact File



Litter surveys

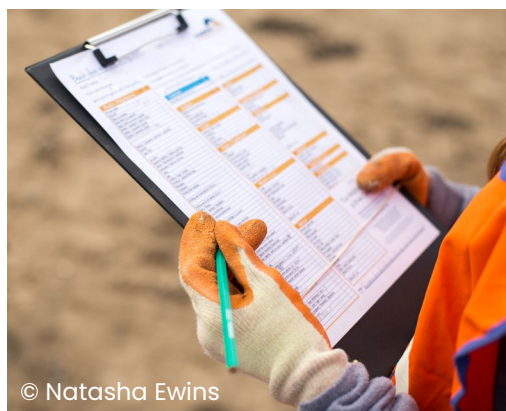
Litter surveys are not only important for clearing rubbish, but also for gathering data on the types of litter polluting our environment. [Beachwatch](#) is our national beach clean and survey initiative, and has been running for over 25 years. Our brilliant volunteers head out to beaches across the UK to clean and survey our coastline, collecting and recording the rubbish they find in 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.



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© Holtography

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 can include redesigning products or calling for economic incentives like Deposit Return Schemes (DRS), where a small deposit is paid when people 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-designed into 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

Your school and the ocean

Name:

Our school's name is:

The coordinates for
our school are:

The village or town our
school is in is called:

Our nearest river is
called:

The mouth of the
river is:

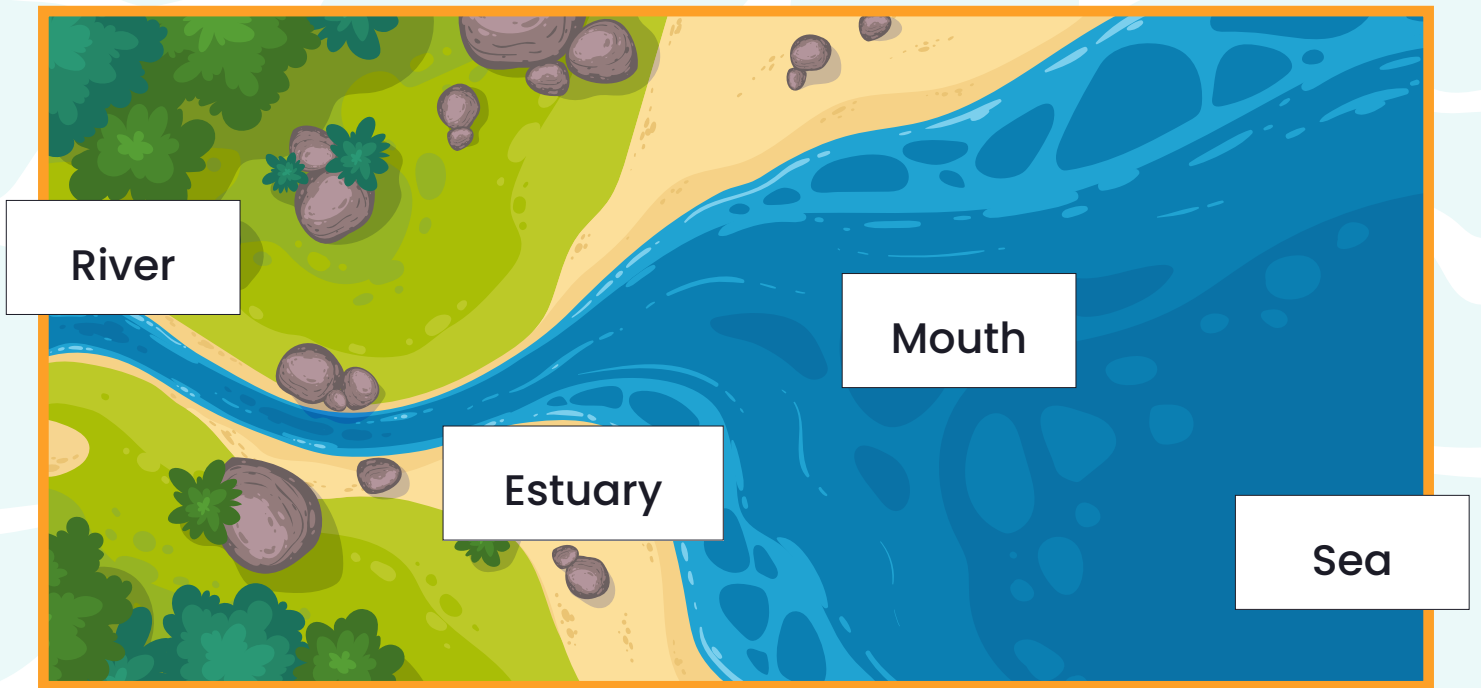
What is the name of
the estuary?

What is the name of
the nearest town to
the estuary?

How far is your school to the
mouth of the estuary?

What is the name of
the sea in this area?

What is the section of ocean
nearest to you called:



**On the map mark roughly
where your school is
and where your nearest
river meets the sea.**

Your school and the ocean

Name:

Our school's name is:

The coordinates for our school are:



Find your school on google earth by typing in your school name in the search function. Find the coordinates in the bottom right hand corner.

The village or town our school is in is called:

Our nearest river is called:



Zoom out to find the nearest river to your school

Did you know?

The place where a river enters a lake, larger river, or the ocean is called its mouth. We are going to follow your river on its journey to the sea.



In the search bar on google earth type in the name of your nearest river. Click more info to find out where the mouth of the river is.

The mouth of the river is:

You're getting closer to the sea! The river mouth may lead you to the sea or it might flow into another river. If it leads you to another river you will need to search again for the mouth of the second river until you reach the sea.

Did you know?

When the mouth of the river meets the sea, this is called an estuary.

What is the name of the estuary?

What is the name of the nearest town to the estuary?



Use the measurement tool on google earth

How far is your school to the mouth of the estuary:



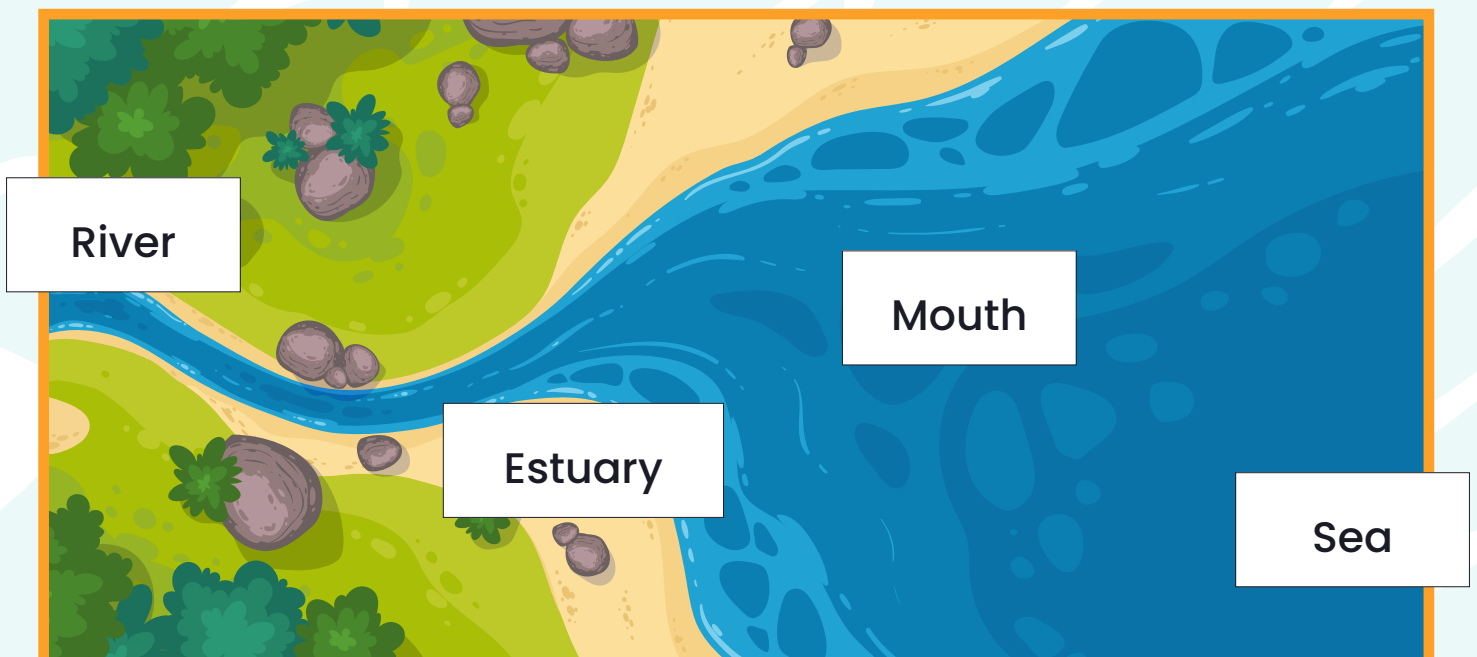
Zoom out to find the name of the sea closest to your school. The sea is the are of the ocean closet to and surrounding land.

What is the name of the sea in this area?



Zoom out even more to find the name of the ocean closet to you.

What is the section of ocean nearest to you called:



**On the map mark roughly where your school is
and where your nearest river meets the sea.**

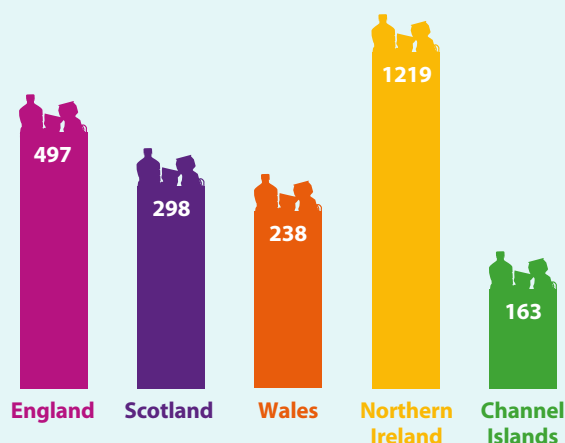


Great British BEACH CLEAN

2020 Report

How much litter did we find?

Average number of items by 100m



What were the materials?

73.7% Plastic/polystyrene

8.6% Sanitary items

5.1% Paper/cardboard

3.9% Glass

2.8% Metal

1.6% Cloth

1% Wood

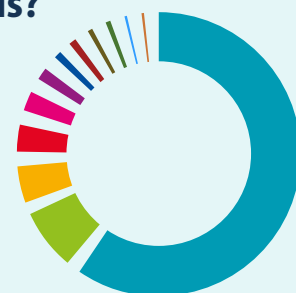
0.9% Rubber

0.8% Pollutant items

0.7% Pottery/ceramic

0.4% Dog faeces

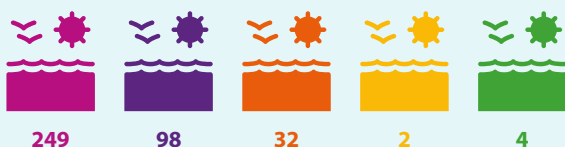
0.3% Medical items



How many volunteers took part?



How many beaches were cleaned?



Where did it come from?



51.9% Non-sourced
Hard to know where it's from – mainly because it's too tiny to identify

27.7% Public
Litter that the public has not disposed of correctly – usually left on beaches, blown in off the street, or carried by waterways

8.9% Fishing
All the things from lobster pots to fishing nets, that help anglers and commercial fishermen catch seafood

8.6% SRD
Sanitary products and other household items that are flushed down the loo but should go in the bin

2% Shipping
Objects lost, or thrown overboard from small craft or massive ships

0.6% Fly-tipped
Illegally dumped items like TVs, mattresses and tyres

0.3% Medical
Pill packets to syringes.

What did we find?



Beach clean data

Name:

What was the most common material found on UK beaches in 2020?

What percentage of litter came from public sources?

Out of the total number of beaches cleaned, work out the percentage of beaches that were in England?
(show your workings)

A teal-colored fork is positioned vertically on the left side of the page, with its tines pointing upwards. Below the fork, near the bottom left corner, is a small teal-colored circle. The background is white with horizontal grey lines, and a faint, light blue wavy pattern is visible behind the lines.

4 a) What is the second most common litter item found on UK beaches?

4 b) Where might this item have come from?

4 c) How could this item harm wildlife?

4 d) How could we try to reduce the amount of this item found on the beach?

