

What is the 'Great Pacific Garbage Patch' really like?



Age 11-14



60 minutes

Curriculum links

- Describe and locate the 'Great Pacific Garbage Patch'
- Explain how unmanaged waste reaches the ocean

Resources



Slideshow 1:

What is the 'Great Pacific Garbage Patch' really like?



Student Sheet 1a:

The 'Great Pacific Garbage Patch'

Student Sheet 1b:

All about gyres

Student Sheet 1c:

Map the gyres

Student Sheet 1d:

What happened to the rubber ducks?



Video:

NASA Perpetual Ocean



External link:

The Majestic Plastic Bag - A Mockumentary

Lesson overview

This first lesson in the unit introduces students to the topic of marine plastics. First, they visit the 'Great Pacific Garbage Patch' and find out what is happening in the middle of the ocean. Then, students will develop their knowledge of ocean currents and how they can concentrate plastic waste. Last, students will investigate how rubbish reaches the middle of the ocean.

Lesson steps

Learning outcomes

1. Our plastic journey (10 mins)

Students start on their journey to understand and tackle the issue of marine plastic pollution by reflecting on what they already know about the topic through the media.

- Reflect on marine plastic pollution

2. 'Garbage Patch' (10 mins)

The 'Great Pacific Garbage Patch' has been an emblematic case study for the plastic pollution problem. Students travel to the centre of the Pacific to study the issue.

- Describe and locate the 'Great Pacific Garbage Patch'

3. How do ocean gyres form? (15 mins)

The collection of plastics in ocean gyres is caused by rotating ocean currents. Students learn how these currents are formed and how they accumulate plastic.

- Map and investigate ocean gyres
- Describe how plastic accumulates in gyres and is a global phenomenon

4. How does plastic enter a gyre (15 mins)

Students create a flow chart to show how plastic can reach the ocean and what happens when it gets there.

- Differentiate between managed and unmanaged plastic and explain its pathway to the ocean

5. Wall of plastic (5 mins)

Students are invited to write on a post-it note or other format how they feel about the issue of ocean plastics.

- Reflect on marine plastic pollution

Extension or home learning

A home learning exercise can be set using the story of the rubber ducks that have travelled around the world's oceans after a cargo ship lost some from a container over the side.

TEACHER GUIDANCE 1 (page 1 of 3)

WHAT IS THE 'GREAT PACIFIC GARBAGE PATCH' REALLY LIKE?

Step Guidance

Resources

1
10
mins



Introduce the topic of ocean plastics, including the scope of the unit as a whole.

- Using slides 2-4 explain to students that they will be learning about ocean plastics.
- The unit is broken into two separate sections and depending on the time you have allotted, describe how students will begin by learning about the issue of ocean plastics, before an optional fieldwork study.
- Students may have an understanding of the ocean plastics topic from the news and television programmes. Assess the level of knowledge and any misconceptions, using a whole class discussion, with slide 5.
- Any questions or ideas can be written on post-it notes or on the board to serve as a reference point during the unit.



To refresh your own subject knowledge, refer to the Ocean Plastics Subject Updates, especially Learn more: Plastics facts and figures and Learn more: Common plastics myths.



If this is the first time that you have taught a marine focused unit with this class, consider using some of the lessons from the [Oceans for beginners 11-14](#) mini-unit.

Slideshow 1:
Slides 1-5

Subject Update:
Learn more: Plastics facts and figures
Learn more: Common plastics myth

Unit:
[Oceans for beginners 11-14](#)

2
15
mins



Students' journeys into understanding ocean plastics begins with a visit to the 'Great Pacific Garbage Patch'. First noted in 1997 by sailor Charles Moore, the Garbage Patch has become emblematic of the ocean plastics issue.

- Explain to students that they are starting the topic of ocean plastics by visiting the middle of the Pacific Ocean. Use a map or globe to show the location.
- Hand out Student Sheet 1a and showing slide 7, ask students to sketch what they think the Garbage Patch looks like.
- This should be a quick sketch to give an impression and not a complete work of art!
- Review the sketches with a mini-plenary and showing slides 8-10, ask students which they think most closely resembles the 'Great Pacific Garbage Patch'. Slide 9 is in fact the closest and taken from the centre of the Garbage Patch.

Slideshow 1:
Slides 6-15

Student Sheet 1a:
The 'Great Pacific Garbage Patch'

Subject Update:
Learn more: The 'Great Pacific Garbage Patch'

TEACHER GUIDANCE 1 (page 2 of 3)

WHAT IS THE 'GREAT PACIFIC GARBAGE PATCH' REALLY LIKE?

Step Guidance

Resources

- Support students to complete the written answer questions using information on slides 11 and 12 or the information on the Subject Update Learn more: The 'Great Pacific Garbage Patch'.
- Emphasise the scale of the overall ocean plastics issue to complete this section of the lesson using slides 13-15.



A common misconception is that the 'Great Pacific Garbage Patch' is a huge floating island of plastic. In fact, it more closely resembles a plastic soup of smaller particles, interspersed with larger plastic items. Discarded fishing nets can collect other plastic waste, creating small 'islands'. If all the plastic were collected in an island, cleaning the Pacific of plastic would be a much simpler task.

3
15
mins



Step 3 invites students to consider how plastic reaches the ocean.

- Review the different types of plastic waste in the ocean using slide 17. Explain briefly how each type of plastic waste could reach the ocean.
- You can show your class a fun 'mockumentary' charting the course of a plastic bag from being thrown away to reaching the ocean.
- Students are then challenged to create a flowchart showing how plastic can reach the sea. They can work in groups and select any of the examples show. Slide 19 shows students the different flowchart blocks to use and slide 20 show an example of the start of a flow chart on slide 21, with a full completed version on slide 22 that can be used to review the activity.



For more information see Learn more: Sources of marine plastic pollution.



The Majestic Plastic Bag - (<https://youtu.be/GLgh9h2ePYw>) is on YouTube and you may need to contact your IT department to ensure that YouTube videos are viewable in your class.

Slideshow 1:
Slides 16-21

External Link:
The Majestic Plastic Bag - A Mockumentary

Subject Update:
Learn more: Sources of marine plastic pollution

TEACHER GUIDANCE 1 (page 3 of 3)

WHAT IS THE 'GREAT PACIFIC GARBAGE PATCH' REALLY LIKE?

Step Guidance

Resources

4
15
mins



Step 4 introduces students to how ocean currents can accumulate plastic in gyres. The main point to get across here is that the ocean is in constant motion and is not the equivalent of a big swimming pool.

- Use the animation by NASA Perpetual Ocean to show students a model of the system of ocean currents.
- Use slides 24-26 go over the key points for students to know about ocean currents.
- Students then complete the questions on Student Sheet 1b, using slides 27-28 to support this.
- Student Sheet 1c provides an extension activity to research and locate the main gyres.



This lesson step mentions the term 'gyre'. This describes the five main rotating currents across the world's oceans. A working definition is 'a gyre is a large rotating ocean current'.



It is not essential that students understand fully the drivers for ocean currents. You may wish to give a brief overview of how wind causes friction that moves surface waters; how land masses can force waters to move in a different direction; and, finally, how different densities of water drive a larger current system known as the ocean conveyor. For the last point, you can find an in-depth explainer in the Subject Update Learn more: Ocean circulation.

Slideshow 1:
Slides 22-28

Student Sheet 1b:
All about gyres

Student Sheet 1c:
Map the gyres

Video:
NASA Perpetual Ocean

Subject Update:
Learn more: Ocean circulation

5
5
mins



The issue of ocean plastics is thought-provoking and emotional. End this first lesson by asking students how they feel about the issue and gather thoughts and ideas on post-it notes or on the board.

Slideshow 1:
Slides 29

+
20
mins



Students plot the journeys of 28,000 Friendly Floatees bath toys which were lost at sea.

This could be plotted on the completed gyre map or on a second blank map.

The bath toys journey demonstrates a greater interconnectivity between the oceans than previously thought. Plastic from anywhere in the world, once it has entered the ocean, may be transported thousands of miles from its source. Scientists calculate that the North Pacific is the greatest attractor of plastic particles.

A small video clip from the Blue Planet II Episode 4 (19 minutes to 22 minutes) which shows a re-enactment of the incident. This episode is available on BBC iPlayer for UK residents at <https://www.bbc.co.uk/iplayer/episode/b09g5ks6/blue-planet-ii-series-1-4-bigblue>