

SCHEME OF WORK

Lesson 1: What is the 'Great Pacific Garbage Patch' really like?

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.

Learning outcomes

- Reflect on marine plastic pollution
- Describe and locate the 'Great Pacific Garbage Patch'
- Map and investigate ocean gyres
- Describe how plastic accumulates in gyres and is a global phenomenon
- Differentiate between managed and unmanaged plastic and explain its pathway to 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



Video:

NASA Perpetual Ocean



External link:

The Majestic Plastic Bag - A Mockumentary

Lesson 2: What is plastic and why is it a problem in the ocean?

Overview

With plastics being ubiquitous in modern life, students examine what has made this material so popular. Students then learn what happens to litter when it enters the ocean. Finally, the lesson looks at how plastics affect turtles, and whether we have enough information to take drastic action on plastics, or whether we need to wait for more research to be conducted.

Learning outcomes

- Consider how the properties of plastic make it so popular
- Rank how different types of litter biodegrade in the ocean
- Suggest how plastics can harm marine life, including the impacts of microplastics
- Evaluate whether there is enough scientific evidence to take drastic action on plastics
- Consider how the properties of plastic make it so harmful

Resources



Slideshow 2:

What is plastic and why is it a problem in the ocean?



Student Sheet 2a:

Plastic starters

Student Sheet 2b:

What is plastic and why is it a problem in the ocean?

Student Sheet 2c:

Plastic and turtles

Student Sheet 2d:

Plastic action vote

Lesson 3: Plastic case study - tourism in Kenya

Overview

Plastic does not just have an environmental and health impact, it can also affect economies and communities. For tourism locations, a pristine beach will attract more visitors than one covered in plastic waste. In this lesson, students will look at a tourism case study on Lamu Island off the coast of Kenya.

Learning outcomes

- Assess what makes Lamu a popular tourist destination
- Apply mapping skills to describe key processes
- Evaluate the threat caused to Kenya's economy by plastic waste
- Describe how actions at a range of scales are addressing plastic pollution
- Evaluate the threat caused to Kenya's economy by plastic waste

Resources



Slideshow 3:
Plastic case study - tourism in Kenya



Student Sheet 3a:
Lamu tourism brochure

Student Sheet 3b:
Holiday heaven or paradise lost to plastic?

Student Sheet 3c:
Lamu mapping

Student Sheet 3d:
Flipflop case study



External Link:
Yes We Can! Shela to Kipungani Beach Cleanup

External Link:
DePollutionizing Shela Beach

Lesson 4: How can we deal with all the plastic waste?

Overview

With plastic production already exceeding 300 million tonnes per year, the mountain of waste has the potential to grow and grow. This lesson looks at whether recycling can be a solution, before examining three different economic models to see if we need to change the way we look at plastic and plastic products. The lesson asks students to consider the impact of managed, unmanaged and mismanaged waste.

Learning outcomes

- Analyse the rapid growth in global plastic production
- Describe the different paths that plastic can take after disposal
- Consider how effective the UK is at recycling
- Decide whether a linear economy is fit for purpose in the 21st century
- Reflect on artistic works showing the plastic problem

Resources



Slideshow 4:
How can we deal with all the plastic waste?



Student Sheet 4a:
Recycling cards

Student Sheet 4b:
A new economy

Student Sheet 4c:
What happens to plastic waste in Asia and Africa?



Thinglink:
Global plastic production

Thinglink:
Life cycle of a plastic bottle

Lesson 5: The global journey of plastic waste

Overview

The UK exports over half a million tonnes of recovered plastic packaging each year. Historically, much of this was to China, but with a ban on waste imports other solutions and destinations have been sought. Students start by mapping the destinations of plastic waste exports before and after China's ban. Then students consider the UK's options, before ranking these and creating a proposal for action.

Learning outcomes

- Map the global destinations of UK recycling over time
- Describe how these destinations have changed over time
- Review information on the current state of UK plastic waste management
- Evaluate options for the future of UK plastic waste management

Resources



Slideshow 5:

The global journey of plastic waste



Student Sheet 5a:

Plastic export maps

Student Sheet 5b:

Waste management futures info

Student Sheet 5c:

Waste management futures pyramid

Student Sheet 5d:

Whose waste is it anyway?

Lesson 6: Approaches to reducing ocean plastic pollution

Overview

Experts agree on the need for urgent action to tackle the issue of marine plastic pollution but disagree on the what methods should be prioritised. Students will look at two main schools of thought: 'turn off the taps', stopping plastic from entering the ocean by reducing plastic pollution, limiting single-use plastic use, improving waste management, and introducing alternative products; and 'bail out the bath', removing plastic waste from the ocean and beaches. Students engage in a silent debate followed by a group discussion to focus on what they believe is the most effective solution.

Learning outcomes

- **Understand how our use of plastic has caused an environmental crisis, including contributing to climate change, which needs a solution**
- Evaluate different solutions to the problems, which work at different scales
- Apply skills of data gathering from a number of sources
- Debate the positive and negative features of each possible solution
- Communicate geographical information through extended writing

Resources



Slideshow 6:

Approaches to reducing ocean plastic pollution



Student Sheet 6a:

How can we rethink plastic to solve the problem of ocean plastics?

Student Sheet 6b:

Plastic bag ban in Kenya

Student Sheet 6c:

The Ocean Cleanup

Student Sheet 6d:

Plastic straws

Student Sheet 6e:

Reusing packaging

Student Sheet 6f:

Beach clean-ups

Student Sheet 6g:

Recycling

Student Sheet 6h:

Reusable alternatives

Lesson 7: Plastic decision making exercise

Overview

Students work through an end of unit assessment that includes short answer questions, data interpretation questions and a decision making exercise. The decision making exercise uses information that students will have gathered during the silent debate in Lesson 6.

Learning outcomes

- Understand the human use of natural resources has caused an environmental situation which needs a solution
- Understand that there are different solutions to the problems, which work at different scales
- Understand that each possible solution has positive and negative features
- Practise skills of data gathering from a number of sources; processing, interpretation, analysis, information communication and extended writing

Resources



Slideshow 7:
Decision making exercise



Student Sheet 7a:
Ocean plastics assessment



Mark scheme 7a:
Ocean plastics assessment

Lesson 8: Plastics fieldwork (school grounds)

Overview

This lesson provides a framework for conducting plastics fieldwork in the school grounds. As per most fieldwork, it consists of three phases: preparation, conducting fieldwork, and then analysis and conclusions. Depending on your school timetable and ability of your class, you will need to set aside three to four hours to complete this fieldwork activity. Suggestions for challenge tasks are included for more able students, if you teach a mixed ability class.

Learning outcomes

- Plan fieldwork including risk assessment
- Plan and carry out data collection
- Represent data using tables, charts and maps
- Analyse fieldwork data and draw conclusions
- Evaluate fieldwork methods and results
- Suggest ways of improving the area in terms of reducing plastic pollution

Resources



Slideshow 8:
Plastic fieldwork (school grounds)



Student Sheet 8a:
Plastics fieldwork record sheet

Student Sheet 8b:
Plastics fieldwork report frame

Student Sheet 8c:
Plastics fieldwork evaluation

Lesson 9: Plastics fieldwork (local area)

Overview

This lesson provides a framework for conducting plastics fieldwork in the local area. As per most fieldwork, it consists of three phases: preparation, conducting fieldwork, and then analysis and conclusions. Depending on your school timetable and ability of your class, you will need to set aside three to four hours to complete this fieldwork activity. Suggestions for challenge tasks are included for more able students, if you teach a mixed ability class.

Learning outcomes

- Plan fieldwork including risk assessment
- Plan and carry out data collection
- Represent data using tables, charts and maps
- Analyse fieldwork data and draw conclusions
- Evaluate fieldwork methods and results
- Suggest ways of improving the area in terms of reducing plastic pollution

Resources



Slideshow 9:
Plastic fieldwork (local area)



Student Sheet 9a:
Plastics fieldwork record sheet

Student Sheet 9b:
Plastics fieldwork report frame

Student Sheet 9c:
Plastics fieldwork evaluation