

Ocean Plastics

X-Curric | Ages 5 - 7



A resource by Encounter Edu and Common Seas

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With thanks to

Association for Science Education

Design and Technology Association

Geographical Association



Common Seas

Common Seas is a not-for-profit enterprise that researches, designs and implements practical project-based solutions to our global plastic pollution crisis. Our mission is to quickly and significantly reduce the amount of plastic waste produced and stop it polluting rivers and seas.

Encounter Edu

Encounter Edu designs and runs STEM and Global Citizenship education programmes, which make use of virtual exchange, live broadcast and virtual reality. These technologies create classroom encounters that widen young people's world view. Learning is further underpinned by an online library of teacher resources and training. Combined, these provide children with the experience and knowledge to develop as engaged citizens and critical thinkers for the 21st Century.

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Welcome to the Ocean Plastics Academy



Marine plastic pollution is a visible and pervasive environmental issue affecting all oceans. Recent media coverage has raised awareness of the topic, encouraging politicians, businesses and the general public to take much-needed action.

Common Seas believes that education can be an important part of the solution to addressing marine plastic pollution. The recent popularity of the topic of marine plastics has meant that there is a wealth of information and ideas for action scattered across the internet and other media.

Common Seas uniquely provides teachers with a full suite of resources across science, geography, and design and technology across Key Stages 1 to 3, that are designed to fulfil the English National Curriculum teaching requirements. Providing teachers with off the shelf lesson plans, presentations and activities they can choose to deliver in their entirety or use sections as appropriate.

Supporting a more sustainable relationship with the environment is not a quick fix, but a multi-generational endeavour. This is why Common Seas works with a range of partners to move marine plastics education from an important side issue into the mainstream.

Jo Royle
Managing Director
Common Seas

OVERVIEW

About the Ocean Plastics Academy



What is the Ocean Plastics Academy?

Achieving the aim of plastic-free seas is likely to be a multi-generational endeavour. As with any environmental crisis, the important place to start is from a shared understanding of the problem and then move to solutions both in terms of individual behavioural change and advocating for changes at wider scales from the community-level upwards.

Literacy is the starting point for the education programme. A shared understanding of plastics across its entire life cycle including its impact on the marine environment is crucial in developing appropriate responses and informing action on a personal and community level. A plastics literate population will also be able to inform good governance, both as leaders and voters.

However you choose to address the issue of marine plastic pollution in your classroom, it can be hard to know what children should know. Common Seas has used the UNESCO Learning Objectives for the ocean¹ as a basis for creating a set of Ocean Plastics Learning Objectives to support educators in designing an appropriate set of learning opportunities for students. These learning objectives are listed in following section.

Literacy on its own is not enough and Common Seas will also be developing engagement tools that help to shift literacy into action, so do keep in touch!

How do I use the Ocean Plastics Academy?

These resources have been designed to be an off-the-shelf teaching tool for your classroom. Of course, you know your students better than anyone and may want to adapt and change to suit your needs.

You will find a suite of supporting multimedia resources online, and these are referenced throughout the lesson plans. It is assumed that you have access to a digital projector or interactive white board to display these resources and accompanying slideshows. Students with individual devices can also view multimedia without needing an account.

If this is the first time that you are teaching an oceans-related unit to your students, consider using the Ocean for beginners resources (<https://encounteredu.com/teachers/units/ocean-plastics-x-curric-ages-5-7>) to provide context.

Is the Ocean Plastics Academy curriculum aligned?

Ocean Plastics Academy are aligned to the National Curriculum for England programmes of study for science, geography and design and technology. As the Ocean Plastics Academy develops, we will align the resources to additional curricula and standards.

¹ UNESCO Ocean literacy for all: a toolkit <https://unesdoc.unesco.org/ark:/48223/pf0000260721> (see page 24)

Learning objectives

Common Seas has worked with partners to create a set of universal Ocean Plastics Learning Objectives, utilising the frameworks developed by UNESCO and those working for Ocean Literacy. These learning objectives are listed below and are subscribed to by Common Seas Ocean Plastics Academy partners. We hope that these overarching learning objectives are useful to other individuals and organisations planning their own education programming to help a plastic waste free future.

Ocean Plastics learning objective	Lessons			
	1	2	3	4
Cognitive learning objectives				
• The learner understands the fundamental properties of plastics, including the use of additives.	✓			
• The learner understands the scope and geographical scale of plastic use and plastic pollution historically as well as current predictions.				
• The learner understands the pathways through which plastics enter the ocean and marine life.		✓	✓	
• The learner understands the social, environmental and economic cost of plastics across its entire life cycle.		✓	✓	
• The learner can identify and evaluate ways to improve the sustainability of plastics at different stages of the product life cycle ¹ .				✓
Socio-emotional learning objectives				
• The learner can reflect on their own use of plastics, and how this use might affect the marine environment.	✓		✓	
• The learner actively seeks alternative designs, behaviours and practices that reduce their contribution to plastic pollution.				
• The learner can communicate the societal and environmental impacts of plastic use, referring to the scientific evidence base.				
• The learner is able to influence the behaviours and practices of others in their community in terms of plastic use and management.				
• The learner can collaborate at a range of scales to campaign for the reduction of plastic pollution.				
Behavioural learning objectives				
• The learner is able to access and improve waste management systems in their local area.				
• The learner can plan and implement campaigns that lead to a reduction in plastic pollution at a range of scales.				
• The learner is able to evaluate media narratives about plastic pollution and present a balanced judgement to their peers.				
• The learner is able to make informed decisions as a consumer to reduce plastic pollution.				
• The learner is able to research different approaches to design, including circularity and biomimicry.				

¹ Including improved design, alternative materials, waste management and individual behaviour.

Applicable standards

National Curriculum for England Key Stage 1

KS1 Science Element of the Science Programme of Study	Lessons			
	1	2	3	4
Everyday materials <ul style="list-style-type: none"> Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses Describe the simple physical properties of a variety of everyday materials Compare and group together a variety of everyday materials on the basis of their simple physical properties 	✓	✓		
Animals including humans <ul style="list-style-type: none"> Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals Identify and name a variety of common animals that are carnivores, herbivores and omnivores 			✓	
Living things and their habitats <ul style="list-style-type: none"> Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other Identify and name a variety of plants and animals in their habitats, including microhabitats Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food 			✓	✓
Working Scientifically <ul style="list-style-type: none"> Ask simple questions and recognising that they can be answered in different ways Observe closely, using simple equipment Perform simple tests Identify and classify Use their observations and ideas to suggest answers to questions Gather and record data to help in answering questions 	✓	✓	✓	✓

Applicable standards

National Curriculum for England Key Stage 1

KS1 Geography		Lessons			
Element of the Science Programme of Study	1	2	3	4	
Location knowledge					
<ul style="list-style-type: none"> Name and locate the world's seven continents and five oceans 		✓	✓	✓	
Human and physical geography					
<ul style="list-style-type: none"> Use basic geographical vocabulary to refer to key physical features, including beach, cliff, coast, forest, hill, mountain, sea, ocean, river, soil, valley, vegetation, season and weather 		✓	✓	✓	
<ul style="list-style-type: none"> Use basic geographical vocabulary to refer to key human features, including city, town, village, factory, farm, house, office, port, harbour and shop 		✓	✓	✓	
Geographical skills and fieldwork					
<ul style="list-style-type: none"> Use world maps, atlases and globes to identify the United Kingdom and its countries, as well as the countries, continents and oceans studied at this key stage 		✓	✓	✓	

KS1 English		Lessons			
Element of the Science Programme of Study	1	2	3	4	
Spoken language					
<ul style="list-style-type: none"> Listen and respond appropriately to adults and their peers 	✓	✓	✓	✓	
<ul style="list-style-type: none"> Ask relevant questions to extend their understanding and knowledge 	✓	✓	✓	✓	
<ul style="list-style-type: none"> Articulate and justify answers, arguments and opinions 	✓	✓	✓	✓	
<ul style="list-style-type: none"> Give well-structured descriptions, explanations and narratives for different purposes, including for expressing feelings 	✓	✓	✓	✓	
<ul style="list-style-type: none"> Maintain attention and participate actively in collaborative conversations, staying on topic and initiating and responding to comments 	✓	✓	✓	✓	
<ul style="list-style-type: none"> Use spoken language to develop understanding through speculating, hypothesising, imagining and exploring ideas 	✓	✓	✓	✓	
<ul style="list-style-type: none"> Participate in discussions, presentations, performances, role play, improvisations and debates 	✓	✓	✓	✓	
<ul style="list-style-type: none"> Consider and evaluate different viewpoints, attending to and building on the contributions of others 	✓	✓	✓	✓	

SCHEME OF WORK

Lesson 1: What are plastics?

Overview

This lesson introduces students to a range of materials and allows them to compare and describe their properties. Students develop their understanding of what is meant by materials and investigate four in particular; wood, metal, glass and plastic. They then discover why certain materials are chosen to make different products. Focussing in on plastic, students explore the variety of items which are made of or contain plastic. They then conduct an investigation to find out which material is the most effective at waterproofing.

Learning outcomes

- Identify, classify and describe a range of materials
- Explain why materials are used in different ways
- Identify a variety of items made from plastic
- Investigate which materials are most waterproof
- Summarise some of the everyday uses for plastic

Resources



Slideshow 1:
What are plastics?



Activity Overview 1a:
Waterproofing investigation



Student Sheet 1a:
Waterproofing investigation

Lesson 2: Where are plastics?

Overview

In this lesson students consider what happens to their rubbish once they have disposed of it. They discover the route a plastic bottle might take to landfill, recycling or ending up as litter. Students then go on to discover how plastic bottles can be recycled and the new products that can be made. They discuss what happens to plastic that isn't disposed of responsibly, then make posters instructing how to recycle and keep a rubbish and recycling diary to monitor their recycling at home.

Learning outcomes

- Understand what happens to rubbish when it is thrown away
- Discover the products that can be made from recycling plastic
- Consider where discarded plastic might end up if not disposed of responsibly
- Create a poster instructing how to recycle
- Keep a rubbish and recycling diary to monitor their own recycling

Resources



Slideshow 2:
Where are plastics?



Student Sheet 2a:
Rubbish and recycling diary

Lesson 3: What impact can plastic have?

Overview

Students discover what happens to plastic when it ends up in the ocean by exploring some of the examples of how plastic pollution affects marine life. They look at simple ocean food chains and discuss the impact of plastic pollution on these species and their habitats. Students choose a food chain to recreate and write warnings about how plastic litter can affect the species in their food chain. They conclude by considering how they could reduce the amount of plastic they use such as reusable bags and avoiding straws.

Learning outcomes

- Understand how plastic can enter the ocean
- Discover some of the ways this impacts marine life
- Discuss how food chains are affected by plastic pollution
- Create an ocean food chain model with warnings about plastic pollution
- Consider how to reduce the amount of plastic used

Resources



Slideshow 3:
What impact can plastic have?



Student Sheet 3a:
Warning cards

Student Sheet 3b:
Postcard

Lesson 4: What can I do?

Overview

Students discover the 6 Rs and discuss what each one means. They then make suggestions of how they could do each one. Students then complete one of three art projects which not only reuse plastic rubbish but also informs others how they can help fight marine plastic pollution. The completed projects could be displayed around the school or showcased in an assembly.

Learning outcomes

- Understand what is meant by the 6 Rs
- Explain how each of the 6 Rs can be implemented
- Complete an art project demonstrating how to fight marine plastic pollution
- Share learning with a wider audience

Resources



Slideshow 1:
What can I do?



Activity Overview 4a:
Jellyfish in a bottle

Activity Overview 4b:
Plastic fish

Activity Overview 4c:
Lava lamp

Teacher guidance

The Teacher Guidance for each lesson uses a set of icons as seen below to provide visual clues to support teachers:

Lesson activities

**Explain**

teacher exposition using slides or script to support

**Demonstration / watch**

students watch a demonstration or video

**Student activity**

activity for students to complete individually such as questions on a Student Sheet

**Pair activity**

activity for students to complete in pairs

**Group work**

activity for students to complete in groups

**Whole class discussion**

teacher conducts a whole class discussion on a topic or as a plenary review

**Home learning**

home learning exercise for after school or alternatively, a lesson extension

Teacher ideas and guidance

**Assessment and feedback**

guidance to get the most from AfL (Assessment for Learning)

**Guidance**

further information on how to run an activity or learning step

**Idea**

optional idea to extend or differentiate an activity or learning step

**Information**

background or further information to guide an activity or explanation

**Technical**

specific ICT or practical hints and tips

**Health and safety**

health and safety information on a specific activity

Lesson 1: What are plastics?

In this lesson students are introduced to the properties of four common materials and explore where they can be found. They then focus on plastic and discover why it is such a popular and versatile material before testing a variety of materials to find which are waterproof.

Resources in this book:



Lesson Overview 1



Teacher Guidance 1



Activity Overview 1a: Waterproofing investigation



Student Sheet 1a: Waterproofing investigation

Resources available online:



Slideshow 1: What are plastics?

All resources can be downloaded from:
encounteredu.com/teachers/units/ocean-plastics-x-curric-ages-5-7

What are plastics?



Age 5-7



60 minutes

Curriculum links

- Identify, compare and describe properties of materials
- Investigate which materials are waterproof

Resources



Slideshow 1:
What are plastics?



Activity Overview 1a:
Waterproofing investigation



Student Sheet 1a:
Waterproofing investigation

Extension or home learning

Students make a list or draw pictures of items from around the home which are made of plastic and suggest why they are made from that material.

Lesson overview

This lesson introduces students to a range of materials and allows them to compare and describe their properties. Students develop their understanding of what is meant by materials. They then discover why certain materials are chosen to make different products. Focussing on plastic, students explore the variety of items which are made from or contain plastic. They then conduct a waterproofing investigation.

Lesson steps

- 1. What are materials? (5 mins)**
Students are introduced to the concept of materials through comparing the properties of wood, metal, glass and plastic.
- 2. What is a material? (5 mins)**
Students formulate their own definition of what a material is and compare it to a given definition.
- 3. What are materials used for? (10 mins)**
They then discover why certain materials are chosen for different uses and develop key vocabulary used in grouping materials.
- 4. Where can we see plastic? (10 mins)**
Focussing in on plastic, students identify where we commonly find plastic and understand why it is so popular.
- 5. Materials investigation (20 mins)**
Students then conduct an experiment in which they test a variety of materials to see which ones are waterproof.
- 6. Everyday uses of plastic (10 mins)**
Finally, students summarise what they have learned about materials and their properties and in particular the properties and uses of plastic.

Learning outcomes

- Name and describe materials
- Explain why materials are used in different ways
- Create a definition of materials
- Discuss why plastic is used to make a variety of products
- Investigate which materials are waterproof
- Summarise some of the everyday uses for plastic

Step Guidance

Resources

1
5
mins



Step 1 introduces students to a variety of materials to compare and describe.

- Ask students what is meant by materials and take feedback.
- Explain that when we talk about materials, we are not just talking about fabric but about what an item is made from.
- Use slides 3-6 to demonstrate some common materials and ask students to name them and suggest words to describe each one.
- Record vocabulary on the whiteboard or flipchart drawing out answers such as hard, soft, bendy, tough etc.

Slideshow 1:
Slides 1-6

2
5
mins



Step 2 allows students to generate their own definition of a material.

- Show slide 7 and asks students, what is a material? Use the questions on the slide as a prompt to help students generate their own definition.
- Using slide 8, reveal the definition to material. Encourage students to compare their definition with this one. Are they similar or different?

Slideshow 1:
Slides 7-8

3
10
mins



The next step encourages students to think more deeply about why certain materials are chosen for different items.

- Slides 9-11 show a range of items, ask students to suggest why wood has been chosen for a table and glass has been chosen for windows etc.
- Continue to record any new key vocabulary and encourage scientific language where possible, such as transparent, rather than see-through.

Slideshow 1:
Slides 9-11

4
10
mins



Step 3 focusses students' attention on plastic and its properties.

- Use slide 12 to demonstrate a range of items and uses for plastic, which students might find surprising.
- For each one explain why plastic has been chosen and encourage students ideas and feedback.
- Explain that its versatility is one of the reasons plastic is so popular.

Slideshow 1:
Slide 12

Step Guidance

Resources

5
20
mins



In step 4 students investigate which of a range of materials is the most effective at waterproofing by wrapping cotton wool in paper, cloth, plastic and foil and submerging them in water.

- Slide 13 and Activity Overview 1a will guide you through the investigation.
- Ask students to make a prediction about which of the materials they think will keep the cotton wool dry.
- Once students have wrapped the cotton wool in the different materials, they submerge each package in water for 5 minutes then check whether it is still dry inside.
- After another 5 minutes, ask students to tick which material was the most effective at keeping the cotton wool dry.
- They then write a sentence describing what they discovered.
- Explain that the property of being waterproof is one of the reasons plastic is chosen for items such as rain coats and umbrellas, as well as window frames, roofing, transport, storage containers, water bottles etc.
- Ask students to suggest why in each case.

Slideshow 1:
Slide 13

Activity Overview 1a:
Waterproofing investigation

6
10
mins



Finally, in step 5 students summarise what they have learnt about materials and in particular, plastic.

- Using slide 14 ask students to discuss with a partner the properties of each plastic item.

Slideshow 1:
Slide 14

+
20
mins



Students make a list or draw pictures of items from around the home which are made of plastic and suggest why it is a good choice of material.

Waterproofing investigation



Age 5+
(adult supervision)



20 minutes

Details

What you need

- Cotton wool balls
- Timer
- Buckets / containers of water
- Paper
- Foil
- Plastic – such as sandwich bags or shopping bags
- Fabric – such as old socks or torn up pieces of pillow case
- Bulldog clips

Safety and Guidance



Precautions

Care should be taken to avoid spills.

Further guidance

There are many kinds of plastic bags made from different materials to different specifications. Not all will be waterproof. For this activity try to find a conventional plastic bag, as opposed to bioplastic bag. We recommend using one with slightly thicker plastic.

Overview

This activity demonstrates that materials have different properties which make them useful in different ways through observing which materials keep cotton wool balls dry when submerged in water.

Preparation

It may be preferable to run this activity in small groups with an adult so extra support may be required, or you may wish to demonstrate the activity with students helping at different stages. Fill buckets or containers with water beforehand.

Running the Activity

1. Introduce students to vocabulary 'waterproof' and ask for their feedback on what it means, ensuring they understand it must keep whatever is inside completely dry.
2. Look at the four materials and ask students what each is made of and to predict which material will keep the cotton wool completely dry when submerged in water.
3. Help students to wrap the cotton wool in each of the materials, fastening with a bulldog clip.
4. Place each parcel in the water.
5. After five minutes help them unwrap each parcel and ask them to describe what has happened to the cotton wool.
6. Re-wrap the parcels and place back in the water for another five minutes then repeat the step above.
7. Students return to their tables and complete Student Sheet 1a to record their findings.

Expected results

This activity demonstrates that one of the most effective materials for waterproofing is plastic, which is why it is often chosen for manufacturing items which must be waterproof, like waterproof clothing. Ask students to list items they know to be waterproof and state what material they are made of. They may also list materials which aren't plastic such as glass but consider why plastic might be chosen instead.

Waterproofing investigation



Which material is best for keeping cotton wool dry?

Prediction: Tick the material that you think will be best at waterproofing

Paper	Plastic	Fabric	Foil

Results: Put a tick if the cotton wool is dry and a cross if it is wet

	Paper	Plastic	Fabric	Foil
5 mins				
10 mins				

Conclusion: What did you find out?

Lesson 2: Where are plastics?

In this lesson students discover what happens to their rubbish once it is thrown away through exploring recycling, landfill and litter. They create a poster to encourage others to recycle and keep a diary of their recycling at home.

Resources in this book:



Lesson Overview 2



Teacher Guidance 2



Student Sheet 2a: Rubbish and recycling diary

Resources available online:



Slideshow 2: Where are plastics?

All resources can be downloaded from:
encounteredu.com/teachers/units/ocean-plastics-x-curric-ages-5-7

Where are plastics?



Age 5-7



60 minutes

Curriculum links

- Describe what happens to rubbish once it is discarded
- Understand the importance of recycling

Resources



Slideshow 2:
Where are plastics?



Student Sheet 2a:
Rubbish and recycling diary

Extension or home learning

Students keep a rubbish and recycling diary for a week, outlining what recycling looks like where they live, what products they find can be recycled and which plastic products are not recyclable.

Lesson overview

In this lesson students consider what happens to their rubbish once they have disposed of it. They discover the route a plastic bottle might take to landfill, recycling or ending up as litter. Students then go on to discover how plastic bottles can be recycled and the new products that can be made. They discuss what happens to plastic that isn't disposed of responsibly, then make posters instructing how to recycle and keep a rubbish and recycling diary to monitor their recycling at home.

Lesson steps

Learning outcomes

1. What happens to our rubbish? (10 mins)

Students discuss what happens to their rubbish once it is thrown in the bin and share their own experiences of disposing of rubbish at home.

- Understand what happens to rubbish when it is thrown away

2. What is recycling? (10 mins)

They then find out that rubbish takes one of three routes, starting with recycling. Students explore the recycling process and discover what can be made from recycled plastic.

- State the products that can be made from recycling plastic

3. Landfill and litter (10 mins)

Students then go on to see that if plastic isn't recycled it either goes to landfill or ends up as litter. They share their thoughts on these two options.

- Consider where discarded plastic might end up if not disposed of responsibly

4. How to recycle (20 mins)

Armed with this knowledge students create a poster to encourage recycling and explain why it's important for the environment.

- Create a poster instructing how to recycle

5. Recycling at home (10 mins)

Students prepare to keep a rubbish and recycling diary at home, monitoring how much of their rubbish can and is recycled and what the process involves.

- Keep a rubbish and recycling diary to monitor their own recycling

Step Guidance

Resources

1
10
mins



Step 1 introduces students to the different ways in which rubbish is disposed of at home.

- Ask students to discuss in pairs what happens to rubbish in their homes, what types of bins do they have inside and outside their houses?
- Take some feedback, drawing out answers about different types of bins and who takes the rubbish away.

Slideshow 2:
Slides 1-3

2
10
mins



In step 2 students discover that most rubbish takes one of three routes; landfill, recycling or litter.

- Explain that rubbish usually ends up in one of three places; a landfill site, a recycling centre or as litter.
- Using slide 4 explain that they will first look at recycling. State which types of rubbish can be recycled.
- Go through slide 5 which describes how plastic is recycled.
- Slide 6 shows some of the products that are made from recycled plastic.
- Ask students to summarise what they have seen by orally listing with a partner what can be made from recycled plastic bottles.

Slideshow 2:
Slides 4-6

3
20
mins



Step 3 illustrates that if plastic rubbish isn't recycled it goes to landfill or ends up as rubbish.

- Explain that if rubbish such as plastic bottles aren't recycled, they might go to a landfill site.
- Use slide 7 to explain what is meant by landfill and describe some of the problems landfill creates.
- Ask students, what do you think the term groundwater means? Students should deduce it is water underground. Explain that chemicals from landfills can be carried in rain water through the soil to water underneath the soil. Here it can move across land and into other sources of water.
- Ask students what is meant by litter and take some feedback.
- Explain that often plastic rubbish ends up as litter and using slide 8 demonstrate how this litter can sometimes end up in the ocean.
- Ask students what problems plastic litter might cause and take feedback.
- Briefly describe using slide 9 that plastic pollution can be very damaging to wildlife and explain that in the next lesson they will be investigating in more detail the problems plastic pollution causes.

Slideshow 2:
Slides 7-9

Step Guidance

Resources

4
20
mins



The next step allows students to share their knowledge of recycling through creating a poster.

- Ask students what they think is the best thing to do with plastic rubbish, drawing out recycling as the preferable answer.
- Explain that they are going to make a poster which encourages others to recycle and not let their rubbish become litter or end up as landfill.
- Use slide 10 to show students the recycling symbol and explain that whenever they see that symbol, it means the product can be recycled.
- Encourage students to think about the environment when designing their posters.
- You may wish students to work in pairs or individually to create their poster and provide suitable art materials.

Slideshow 2:
Slide 10



The chasing arrow symbol was first used in the paper industry. Since it has been adopted by the plastic industry. Often the three chasing arrows seen alone on packaging suggests the items can be recycled. However, this is dependent on local recycling facilities. You will have to check yours before disseminating information to students.

If the arrows are seen with a number in the centre this does not mean it can be recycled. This indicates the type of plastic the product is made from.

5
10
mins



Step 5 introduces students to the home learning they will complete over the next week; keeping a rubbish and recycling diary at home.

- Use slide 11 to explain that over the next week students will be keeping a rubbish and recycling diary, which will record what they throw away and which bin they used, where they found the recycling symbol and whether they were able to help anyone with their recycling.
- Hand out Student Sheet 2a: Rubbish and recycling diary, which can be printed and folded before completing.

Slideshow 2:
Slide 11

Student Sheet 2a:
Rubbish and recycling diary

+
20
mins



Students keep a rubbish and recycling diary for a week, outlining what recycling looks like where they live, what products they find can be recycled and which plastic products are not recyclable.

Rubbish and recycling diary



Folding instructions

1. Start with the front page top left

2. Fold the centre in half

3. Cut the dotted line through the centre

4. Fold the flaps to the opposite ends

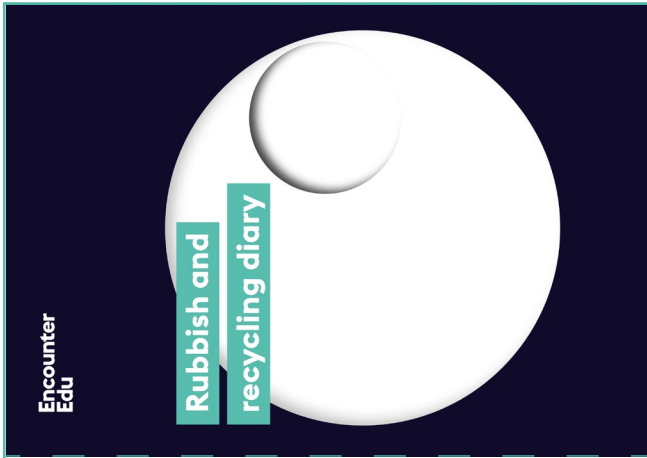
5. Fold it in half vertically

6. Fold it in half horizontally

7. Your diary is now complete

To ensure the Rubbish and recycling diary has the correct proportions print on A3 paper.

STUDENT SHEET 2a

 <p>Encounter Edu</p> <p>Rubbish and recycling diary</p> <p>B</p>	
	2
	3
5	4

Lesson 3: What impact can plastic have?

In this lesson students are introduced to ocean plastic pollution, how it gets there and the species it affects. They learn about ocean food chains and understand the impact pollution has on the wider ecosystem.

Resources in this book:



Lesson Overview 3



Teacher Guidance 3



Activity Overview 3a: Food chain model



Student Sheet 3a: Warning cards

Student Sheet 3b: Postcard template

Resources available online:



Slideshow 3: What impact can plastic have?

All resources can be downloaded from:
encounteredu.com/teachers/units/ocean-plastics-x-curric-ages-5-7

What impact can plastic have?



Age 5-7



60 minutes

Curriculum links

- Understand how plastic can enter the ocean and affect habitats
- Describe food chains and the impact plastic pollution can have

Resources



Slideshow 3:
What impact can plastic have?



Activity Overview 3a:
Food chain model



Student Sheet 3a:
Warning cards

Student Sheet 3b:
Postcard template

Extension or home learning

Students make a postcard encouraging a friend or family member to use less plastic. Focussing on reducing plastic bags, bottles and straws, they can share their postcards with the class before sending them to the recipient.

Lesson overview

Students discover what happens to plastic when it ends up in the ocean by exploring examples of how plastic pollution affects marine life. They look at simple ocean food chains and discuss the impact of plastic pollution on these species and their habitats. Students choose a food chain to recreate and write warnings about how plastic litter can affect the species in their food chain. They conclude by considering how they could reduce the amount of plastic they use such as reusable bags and avoiding straws.

Lesson steps

1. Ocean plastic pollution (10 mins)

Students discover how plastic pollution ends up in the ocean and what type of plastic is typically found there.

2. Plastic pollution and marine life (10 mins)

They then look at how plastic pollution affects marine life by considering the impact it has on fish, birds and turtles.

3. Food chains (10 mins)

Students are introduced to the idea of a food chain and understand how marine life is interconnected. They examine the impact plastic pollution has on certain species and explain how this affects the whole ecosystem.

4. Food chain model (20 mins)

Students create a marine food chain of their choice using construction materials and annotate with warnings about the negative impact plastic pollution can have.

5. Reducing plastic consumption (10 mins)

Finally, students discuss how they could reduce the amount of plastic they currently use.

Learning outcomes

- Understand how plastic can enter the ocean
- Discover some of the ways this impacts marine life
- Discuss how food chains are affected by plastic pollution
- Create a marine food chain model with warnings about plastic pollution
- Consider how they can reduce the amount of plastic they use

Step Guidance

Resources

1
10
mins



Step 1 introduces students to the issue of marine plastic pollution and describes how it occurs.

- Ask students to discuss with a partner what they already know about what happens to our rubbish when we throw it away.
- Explain that today they will be finding out about what happens when plastic pollution ends up in the ocean.
- Using slide 3 demonstrate how plastic rubbish can end up in the ocean.
- Encourage students to share their thoughts and feelings as you go through the slides.

Slideshow 3:
Slides 1-3

2
10
mins



The next step demonstrates how plastic pollution can affect marine life.

- Ask students to suggest how this plastic pollution might affect or harm the animals that live in the ocean and take feedback.
- Using slides 4-6 look at some of the ways plastic pollution can harm animals, such as becoming entangled or ingesting plastic.
- Students talk to a partner after each slide about where the plastic might have come from.
- Encourage students to feedback.

Slideshow 3:
Slides 4-6

3
10
mins



Step 3 introduces the concept of food chains and considers the impact of plastic pollution.

- Ask students to share anything they already know about food chains.
- Use slide 7 to explain what is meant by a food chain.
- Go through slides 8 and 9 demonstrating a variety of other food chains.
- Using slide 10 ask students what would happen if one of the animals in the food chain was threatened? What would happen to the other animals either side of it.
- Explain that due to plastic pollution many food chains are being disrupted having a wider impact on marine life.

Slideshow 3:
Slides 7-10

TEACHER GUIDANCE 3 (page 2 of 2)

Step Guidance

Resources

4
20
mins



In step 4 students construct their own food chain and consider the impact plastic pollution could have on it.

- Use Activity Overview 3a to run the activity.
- Ask students to consider what would happen if plastic pollution was to threaten one of the species, take feedback.

Slideshow 3:
Slide 11

Activity Overview 3a:
Food chain model

Student Sheet 3a:
Warning cards

5
10
mins



Finally, students discuss what they can do to help reduce the impact of plastic pollution by reducing their plastic consumption.

- Explain that one of the ways we can help marine animals is by using less plastic.
- Use slide 12 to demonstrate some of the ways to reduce plastic consumption such as taking reusable bags to the super market, avoiding straws and choosing reusable water bottles.
- Ask students to share with a partner what they will do to reduce the amount of plastic they use.
- Take feedback about how they will make these changes.

Slideshow 3:
Slide 12

+
20
mins



Students make a postcard using Student Sheet 3b encouraging a friend or family member to use less plastic. Focussing on reducing plastic bags, bottles and straws, they can share their postcards with the class before sending them to the recipient.

Food chain model



Age 5+
(adult supervision)



20 minutes

Details

What you need

- Modelling material such as plasticine

Safety and Guidance



Precautions

Scissors should be used under adult supervision.

Overview

In this activity students create a food chain model demonstrating how animals depend on one another for food.

Preparation

It may be preferable to run this activity in small groups with an adult so extra support may be required.

Running the Activity

1. Explain that students will be creating their own food chain using materials such as plasticine.
2. Slide 12 suggests which animals students can choose from. Advise students to choose three or four animals for their food chain.
3. Students then spend 10 minutes constructing their animals and placing them in the correct food chain order.
4. Ask students to consider what would happen if plastic pollution was to threaten one of the species, take feedback.
5. Hand out Student Sheet 3a: Warning cards and ask students to draw or write a warning about the impact of plastic pollution on the animals in their food chain, for example, Warning! Sea turtles can die from eating plastic!
6. As an extension ask students to write an explanation of how this impacts the wider food chain.

Expected results

Students will see how animals are dependant on one another for food and how a threat to one animal can break the chain and affect multiple species.

Warning cards



Warning cards template with four boxes. Each box has a top section with diagonal hatching and the word "WARNING" in a teal box. The bottom section is a large empty rectangle for a message. A pair of scissors icon is located to the right of the top-right card.

Postcard template



POSTCARD

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Lesson 4: What can I do?

The last lesson in this unit introduces students to the 6 Rs and encourages them to implement change in their own lives, culminating in an art project designed to showcase their learning and demonstrate how to take action against marine plastic pollution.

Resources in this book:



Lesson Overview 4



Teacher Guidance 4



Activity Overview 4a: Jellyfish in a bottle

Activity Overview 4b: Plastic fish

Activity Overview 4c: Lava lamp

Resources available online:



Slideshow 4: What can I do?

All resources can be downloaded from:
encounteredu.com/teachers/units/ocean-plastics-x-curric-ages-5-7

What can I do?



Age 5-7



60 minutes

Curriculum links

- Explain and describe the 6 Rs
- Create an art project to demonstrate learning

Resources



Slideshow 4:
What can I do?



Activity Overview 4a:
Jellyfish in a bottle

Activity Overview 4b:
Plastic fish

Activity Overview 4c:
Lava lamp

Extension or home learning

Students research online what more can be done to help reduce marine plastic pollution.

Lesson overview

Students discover the 6 Rs and discuss what each one means. They then make suggestions of how they could do each one. Students complete one of three suggested art projects which not only reuses plastic rubbish but informs others how they can help fight marine plastic pollution. The completed projects could be displayed around the school or showcased in an assembly.

Lesson steps

1. The 6 Rs (10 mins)

Students are introduced to the 6 Rs: reduce, reuse, recycle, rethink, repair, refuse and discuss the examples given.

2. What can you do? (5 mins)

They then reflect in pairs how they could implement the 6 Rs in their own lives and encourage their friends and families to do the same.

3. Art activism (35 mins)

Students choose from one of three art projects designed to reuse plastic rubbish and demonstrate what they learnt about marine plastic pollution through their creations.

4. Show and tell (10 mins)

They then display their projects or showcase them in an assembly and share their knowledge with a wider audience.

Learning outcomes

- Understand what is meant by the 6 Rs
- Explain how each of the 6 Rs can be implemented
- Complete an art project demonstrating how to fight marine plastic pollution
- Share their learning with a wider audience

TEACHER GUIDANCE 4 (page 1 of 1)

Step Guidance

Resources

1
10
mins



In step 1 students are introduced to the 6 Rs and understand what each one means.

- Explain that one of the ways we can help reduce marine plastic pollution is by following the 6 Rs.
- Go through slides 3-9 which explain each of the 6 Rs (reduce, reuse, recycle, rethink, repair and refuse) and highlight examples of how to do each one.
- Ask students if they already do any of the 6 Rs and take feedback.

Slideshow 4:
Slides 1-9

2
5
mins



Step 2 sees students discuss how they could do the 6 Rs at home and at school.

- Slide 10 recaps the 6 Rs, ask students to talk with a partner about how they could do each of the 6 Rs with their friends and families.
- Ask pairs to share ideas.

Slideshow 4:
Slide 10

3
35
mins



In step 3 students complete an art project which not only reuses plastic rubbish but also raises awareness about the 6 Rs.

- Explain that students will create a piece of art that reuses a piece of plastic rubbish.
- Use slide 11 to explain that their art project will also help raise awareness about plastic pollution and teach others about the 6 Rs.
- Use Activity Overviews 4a, b or c to select which project your students will complete.

Slideshow 4:
Slide 11

Activity Overview 4a:
Jellyfish in a bottle

Activity Overview 4b:
Plastic fish

Activity Overview 4c:
Lava lamp

4
10
mins



Finally, students share their projects with a wider audience.

- The finished art projects can form a classroom display or could be exhibited in an assembly where students can share what they've learnt about the 6 Rs and ocean plastic pollution.

Slideshow 4:
Slide 12

+
15
mins



Students research online what more can be done to help reduce marine plastic pollution.

Jellyfish in a bottle



Age 5+
(adult supervision)



20 minutes

Details

What you need

- 1 used polythene food bag
- 1 used plastic water bottle
- Thread
- Blue food colouring
- Scissors
- Water

Safety and Guidance



Precautions

Care should be taken to avoid spills. Remind students and demonstrate how to conduct the investigation safely.

Overview

This activity creates a lifelike jellyfish which rises and falls within a bottle.

Preparation

It may be preferable to run this activity in small groups with an adult as extra support may be required. Students will each need to bring in a used water bottle and used plastic bag in advance.

Running the Activity

1. Flatten the plastic bag and cut off the bottom and the handles, then cut down the sides so you end up with two square, plastic sheets.
2. Take the centre of one plastic sheet and gather together to make a small balloon. Wrap the thread around the neck of the balloon but do not tighten yet as you need to pour in some water later.
3. Cut the plastic below the neck thread into long ribbons (these are the tentacles), you need about 8-10.
4. Each tentacles length can then be altered or slit again to make thinner tentacles.
5. Pour some water into the balloon but leave a little space as it needs air to float.
6. Tighten up and tie off the string.
7. Pour a few drops of blue food colouring into the water bottle and fill with water.
8. Carefully poke the jellyfish into the bottle and tighten the bottle lid securely.

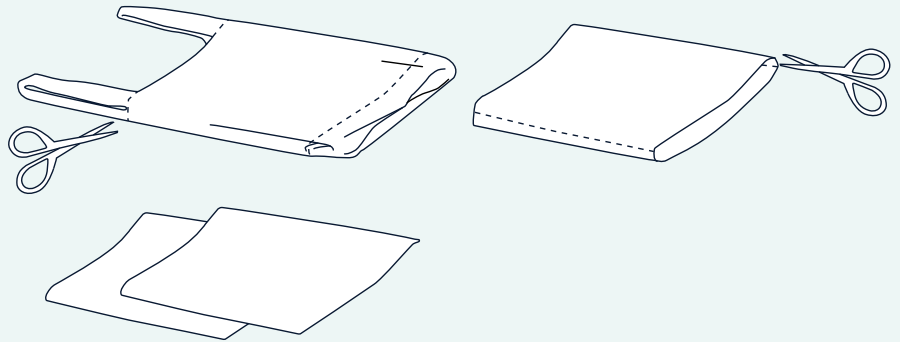
Expected results

As you turn the bottle the jelly fish should float to the top. It is important that children understand the materials for this project are being reused, they should not be brought new.

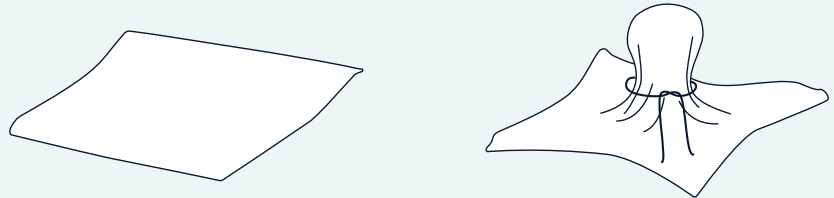
ACTIVITY OVERVIEW 4a

Running the Activity

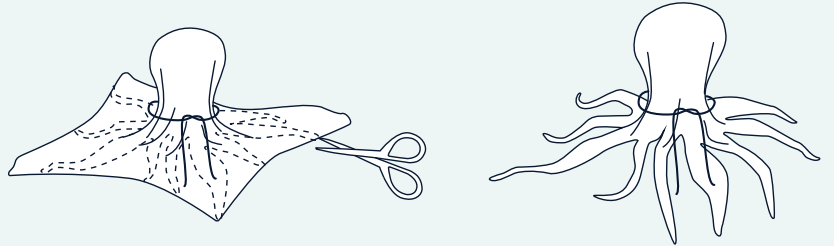
1. Flatten the plastic bag and cut off the bottom and the handles, then cut down the sides so you end up with two square, plastic sheets.



2. Take the centre of one plastic sheet and gather together to make a small balloon. Wrap the thread around the neck of the balloon but do not tighten yet as you need to pour in some water later.

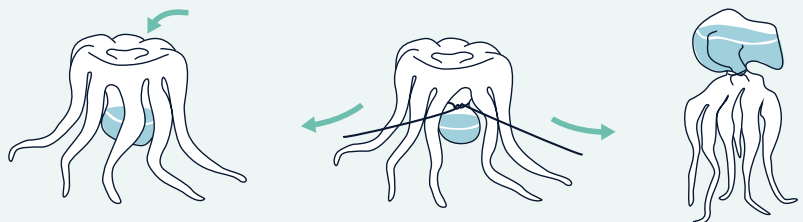


3. Cut the plastic below the neck thread into long ribbons (these are the tentacles), you need about 8-10.



4. Each tentacles length can then be altered or slit again to make thinner tentacles.

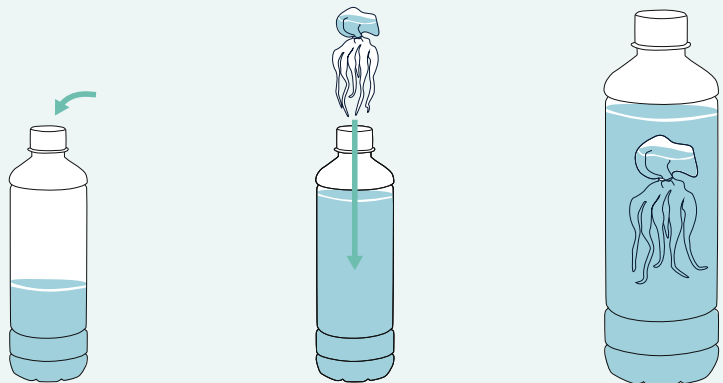
5. Pour some water into the balloon but leave a little space as it needs air to float.



6. Tighten up and tie off the string.

7. Pour a few drops of blue food colouring into the water bottle and fill with water.

8. Carefully poke the jellyfish into the bottle and tighten the bottle lid securely.



Plastic fish



Age 5+
(adult supervision)



20 minutes

Details

What you need

- Used plastic bottles
- Scissors
- Card, craft foam or felt
- Coloured cellophane or tissue paper
- Sticky tape
- Marker pens
- PVA glue

Safety and Guidance



Precautions

All cutting should be done by an adult. Ensure sharp edges are covered.

Overview

This activity allows student's creativity to flourish as they make and decorate a variety of fish which can be hung from the ceiling like a mobile.

Preparation

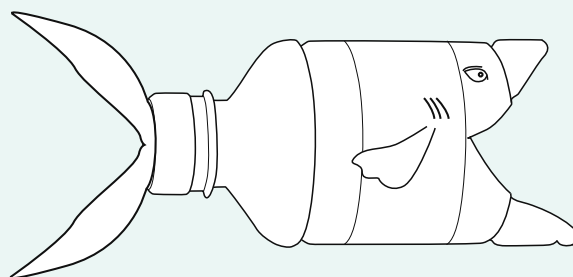
It may be preferable to run this activity in small groups with an adult as extra support may be required. Students will each need to bring in used water bottles in advance.

Running the Activity

1. To create the mouth of the fish an adult should first cut off the bottom of the bottle (see image) and ensure there are no sharp edges. Sharp edges can be covered with sticky tape.
2. Cut fins and a tail from card, craft foam or felt and stick onto the bottle.
3. For the scales, cut or rip small pieces of differently coloured cellophane or tissue paper and glue onto the bottle.
4. Once all the glue has dried use a marker pen to draw the eyes and gills onto the fish.
5. An adult can make a small hole in the top to hang the fish by a piece of string to create a mobile or display.

Expected results

A wide variety of fish species can be crafted, creating a colourful and exciting interactive display. It is important that children understand the materials for this project are being reused, they should not be brought new.



Lava lamp



Age 5+
(adult supervision)



20 minutes

Details

What you need

- 1 used, clear litre bottle
- 1 cup of water
- 3 cups of vegetable oil
- Fizzing tablets (such as Alka-Seltzer)
- Food colouring

Safety and Guidance



Precautions

Care should be taken to avoid spills, have towels handy to mop up spillages.

Overview

This activity creates a funky lava lamp from an old plastic bottle.

Preparation

It may be preferable to run this activity in small groups with an adult as extra support may be required. Students will need to bring in used water bottles in advance.

Running the Activity





1. Pour the water into the bottle using a funnel.
2. Carefully pour the vegetable oil into the bottle using the funnel.
3. Add 10 drops of food colouring, wait a few minutes for everything to settle.
4. Break a fizzing tablet in half and drop half into the bottle.
5. If the water spills out of the top of the bottle, pour a little oil away.
6. Once it has stopped fizzing, simply add another ½ tablet to get it going again.
7. Students can also try shining a torch underneath to get a true lava lamp effect!

Expected results

Coloured water droplets are propelled through the oil by gas bubbles generated from the fizzing tablet. Once they reach the surface they sink back to the bottom as water is denser than oil. This could form a learning opportunity for older or more able students. It is important that children understand the materials for this project are being reused, they should not be brought new.

This book and associated resources can be accessed from encounteredu.com/teachers/units/ocean-plastics-x-curric-ages-5-7



-  Videos and interactive diagrams
-  Individual lesson and resource downloads
-  Live broadcasts with scientists and innovators
-  Subject Updates and training courses

Other books in this series



Ocean Plastics X-Curric
7-11



Ocean Plastics Science
11-14



Ocean Plastics Geography
11-14



Ocean Plastics D&T
11-14

Photo credits

Cover

Student Sheet 1a

Student Sheet 3a

Student Sheet 3b

All other photos

Coastline: Tobias Tullius

Plastic waste: Daria Shevtsova

Wellington boots: Jim Grandy

Gannet: A Different Perspective

Mailboxes: Pexels

Encounter Edu



Ocean Plastics 5-7 is a cross-curricular unit of work encompassing science and geography which also develops skills in spoken language. The unit addresses four key questions; what are plastics, where are plastics, what impact can plastics have and what can I do?

These questions are answered by developing students understanding of properties of materials, living things, habitats and human and physical geography.

The unit explores the pros and cons of a variety of plastic products, investigates how plastic finds its way to the ocean and looks at what changes can be made on a local and global scale. Students understand the complex issues surrounding oceans plastics through this units optimistic and innovative approach to challenging attitudes and behaviour.

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Learning
Meets
The World**

www.encounteredu.com

Encounter Edu and Common Seas have partnered to create the Ocean Plastics Academy. We believe that equipping young people with the knowledge, experience and courage to address plastic pollution is an important part of the solution. Ocean Plastics Academy supports educators by providing them with an authoritative and standards-linked set of resources aligned with the national curriculum to support students to build their knowledge on related topics year on year. www.commonseas.com