LESSON 1

What can we do to reduce ocean plastic pollution?

Age 11-14

60 minutes

Curriculum links

- Investigate new and emerging technologies
- Understand developments in design and technology, its impact on individuals, society and the environments

Resources

Slideshow 1:
What can we do to reduce ocean plastic pollution?

Student Sheet 1a:
What are the 6 Rs?

Student Sheet 1b:
Is recycling rubbish?

Student Sheet 1c:
Life cycle of a plastic bottle

Student Sheet 1d:
Waste hierarchy research

Extension or home learning

Students research ways that the 6 Rs can be used to make a product more sustainable. Students annotate Student Sheet 1d with their findings.

Lesson overview

This first lesson in this design and technology Key Stage 3 (KS3) unit introduces students to ocean plastic pollution. Students learn how the waste hierarchy is used to encourage a reduction in plastic use. Using the various teacher resources students will link the waste hierarchy to the life cycle of plastic, thinking about how the methods used in recycling link to those used in the redesign processes and how those affect the lifetime of plastic products.

Lesson steps	Learning outcomes
1. Introduction (5 mins) Students start the unit of work by thinking about what plastic they have used today.	• List the uses of plastics
2. Why is plastic a concern? (10 mins) Students learn about the importance of plastic. Students will then complete a true or false quiz, which looks at the scale of plastic production.	• Discuss the importance of plastic
3. What is the waste hierarchy? (15 mins) Independently students study the waste hierarchy and the 6 Rs, considering what actions are required for the various levels of the hierarchy.	• Define the 6 Rs
4. What is the product life cycle of plastic? (20mins) Students complete a decision making exercise. After reading some information and statistics about UK recycling, students consider the positives and negatives.	• Evaluate the effectiveness of recycling in the UK
5. Sustainability? (10 mins) Students will draw a flow chart that shows the product life cycle of plastic.	• Describe the life cycle of plastic

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WHAT CAN WE DO TO REDUCE OCEAN PLASTIC POLLUTION?

Step	Guidance	Resources
1 5 mins	Step 1 is the introduction to the lesson, with students reviewing the whole unit and learning objectives for the lesson. · Students start the lesson by either making a list in their books or discussing with a peer what plastic products they have used today. · Choose one or two students to share their list with the rest of the class. · Read through the titles of the lessons in this unit of work. Students understand what they are expected to learn during this unit of work. · Ask 4 different students to read through the learning objectives.	**Slideshow 1:** Slides 1-4
2 10 mins	Step 2 focuses on developing the knowledge and understanding of plastic. · Using slides 5 and 6 go through the positives of plastics, this should discourage some misconceptions students have. Plastic is a very important product and we will never be able to completely stop using plastic - it is throwaway culture and the culture of single use plastic that needs to be eradicated. · Use slide 5 to go through some basic information about plastics with the students. This gives them an insight into the many positives of plastics. · Slide 6 shows a number of products which have had huge impacts on modern society. Ask students to list other important plastic products. · Talk through the significance of the different products using the information below. · As mentioned before, it is the disposing of plastic which has caused a number of issues, particularly in our oceans. Use slide 7 to express this to the students. · Quiz student on their knowledge of plastic production using the true or false quiz on slides 8 to 27. · Tupperware and other food packaging – this allows food to kept fresh for longer, which reduces waste by reducing the amount of food that is discarded. · Car – the lightweight and durable nature of plastic means it is perfect for manufacturing cars and other vehicles. Many aspects of a car are now made from plastic, making the weight of the car lighter and more fuel-efficient. · Medical equipment – syringes, tubing, medicine bags and many other pieces of medical equipment are plastic, this means they are more hygienic, more efficient and safer. The use of plastic has allowed medical practices to evolve.	**Slideshow 1:** Slides 5-27

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WHAT CAN WE DO TO REDUCE OCEAN PLASTIC POLLUTION?

Step	Guidance	Resources
3 10 mins	Step 3 moves on to look at the waste hierarchy. · Introduce students to the waste hierarchy. Talk through the different stages, asking student to define what each method in the waste hierarchy means. · Ask students to draw the waste hierarchy in their books. · Hand out Student Sheet 1a. · Using slide 29, ask students to match up the definitions to the key words on Student Sheet 1a. · The answers are on slide 30. · Go through the answers, giving students a chance to check their answers and make changes. Recycle - Recycling a plastic drinks bottle after use. Reuse - Using a plastic bottle multiple times after first use. Reduce - Minimising the amount of times you buy a plastic bottle. Refuse - Not buying any drinks which come in plastic bottles. Repair - Fixing an older reusable bottle and using that instead. Redesign - Starting afresh and creating a new, more sustainable drinks bottle	**Slideshow 1:** Slides 28-30 **Student sheet 1a:** What are the 6 Rs?
4 20 mins	Step 4 encourages students to evaluate the effectiveness of recycling in the UK. · Hand out Student Sheet 1b. · Students to read the information and statistics about UK recycling. · Following this students evaluate the effectiveness of recycling in the UK - they are to identify the positive and negatives of the systems used in the UK. They should then suggest what could be improved upon.	**Slideshow 1:** Slide 31 **Student Sheet 1b:** Is recycling rubbish?
5 10 mins	Step 5 introduces the product life cycle of plastic to the students. · Using slide 32, share the product life cycle of plastic with the class. Talk through the different stages. · Hand out Student Sheet 1c. · Students to draw a flow chart showing the product life cycle of a plastic bottle with annotations.	**Slideshow 1:** Slides 32 **Student Sheet 1c:** Life cycle of a plastic bottle
+ 20 mins	Students research ways that the 6 Rs can be used to make a product more sustainable. Students annotate Student Sheet 1d with their findings.	**Student Sheet 1d:** Waste hierarchy research