

How can we deal with all the plastic waste?



Age 11-14



60 minutes

Curriculum links

- Understand key processes in human geography: use of natural resources and economic development
- Understand how human processes change landscapes and environments

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?



Diagram:

Global plastic production interactive

Diagram:

Life cycle of a plastic bottle

Lesson 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.

Lesson steps

Learning outcomes

1. How much plastic? (10 mins)

Students analyse a graph of the increase in plastic production and decide how best to communicate these figures.

- Analyse the rapid growth in global plastic production

2. Where does the plastic go? (10 mins)

Students study a graphic of the life cycle of a plastic bottle with special reference to disposal. They are asked to describe and then rank the different paths that plastic can take after it has been thrown away.

- Describe the different paths that plastic can take after disposal

3. How good are we at recycling? (15 mins)

Students play a short game to see if they know what common items can be recycled. They are then given a variety of facts to discuss and then decide how effective the UK is at recycling.

- Consider how effective the UK is at recycling

4. Is recycling enough? (15 mins)

Students will reflect on the fact that recycling may not be enough to tackle the plastic issue and that new ways of thinking may be needed as well.

- Decide whether a linear economy is fit for purpose in the 21st century

5. How can art help? (10 mins)

As a plenary, students study the work of photographer Karl Taylor, and reflect on what art can bring to the understanding of an issue, that statistics and facts may not.

- Reflect on artistic works showing the plastic problem

Extension or home learning

A home learning exercise can be set for students to investigate the global context of recycling.

TEACHER GUIDANCE 4 (page 1 of 4)

HOW CAN WE DEAL WITH ALL THE PLASTIC WASTE?

Step Guidance

Resources

1
10
mins



The first three lessons examined the nature and impact of plastic pollution, this lesson starts the process of looking at waste management and potential solutions. The first lesson step looks at the scale of global plastic production.

- Share the learning objectives for the lesson and connect to previous learning.
- Give students two minutes to come up with a list of every single item of plastic they have touched so far today.
- Compare lists as a whole class discussion, emphasising how plastic is a huge part of our everyday lives.
- Use slides 4-6 to remind students that they may have come into contact with plastic without realising.
- Use slide 7 to focus students on the amount of plastics produced each year since the 1950s.
- Either writing in books or as a whole class discussion ask students to answer the question related to the graph on slide 7

Slideshow 4:
Slides 1-7



The graph on slide 7 is also available online as an interactive graphic at <https://encounteredu.com/discover/images/global-plastic-production-interactive>.

Diagram:
Global plastic production interactive

2
10
mins



One of the concepts to reinforce for students is to consider 'where is away?' when they throw something away.

- Frame this section of the lesson using slide 8.
- Review the pie chart on slide 9 to show how little plastic has been recycled historically and how much is potentially ending up in the environment.
- Ask students to view the image on their devices individually or in small groups.
- Showing slide 11, have students answer the two questions about what happens to a plastic bottle at and after disposal.

Slideshow 4:
Slides 8-11

Diagram:
Life cycle of a plastic bottle



The interactive image is viewable on all devices at <https://encounteredu.com/discover/images/life-cycle-of-a-plastic-bottle>. If individual or group devices are not available, review the interactive image on the board before answering the questions on slide 11.

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HOW CAN WE DEAL WITH ALL THE PLASTIC WASTE?

Step Guidance

Resources

3

15
mins



At this stage in the lesson, students should be realising that either more plastic needs to be recycled or less plastic needs to be used or both. Step 3 in the lesson looks at some of the issues involved in recycling. Recycling and its global context are explored more in the next lesson.

- Frame this lesson step using slide 12 and hand out copies of Student Sheet 4a to groups.
- Ask students to cut out the items to be recycled and as this is happening, review each of them in turn in case of any misunderstandings.
- Showing slide 13, give student groups 2 minutes to sort the cards into two piles, one for items that can be recycled and one for items that cannot.
- Review student choices and use the recycling information below to help in this process.
- Using slide 14 ask students if they would like to move any of their cards for East Riding of Yorkshire, the Local Authority with the highest recycling rates in the UK. See the info box below for the correct answers.
- Using slide 15, ask students if they would like to move any of their cards again for Tonbridge in Kent. The short answer is that if you live in Tonbridge, the Local Authority does not offer any domestic recycling for plastic.
- Now that students have a better sense of what can and cannot be recycled in the UK, start a quick recycling quiz. There are 10 questions and students can answer in groups. Additional information is in the third info box below.
- Students will be able to debate and discuss some potential changes to how waste is managed in the UK in the next lesson.

Slideshow 4:
Slides 13-35

Student Sheet 4a:
Recycling cards



An analysis of doorstep plastic recycling by the BBC based on WRAP data (<https://www.bbc.co.uk/news/science-environment-45496884>) reveals the following percentage of households in the UK where plastic packaging is collected for recycling:

- Plastic film from fruit box – 11% (unlikely as these can jam machines and are often contaminated with food waste)
- Crisp packet – not recyclable
- Plastic takeaway container – 73%
- Coffee cup – almost never as these are made with several different materials laminated together
- Toothpaste tube – almost never because of the different plastics used
- Polystyrene packing – only 1% as expanded polystyrene crumbles into tiny pieces
- Plastic bottle – 99% of households can recycle these

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HOW CAN WE DEAL WITH ALL THE PLASTIC WASTE?

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Resources

- Plastic bag – only 18% of households can recycle plastic bags
- Bubble wrap – not recycled
- Plastic fruit box – 73% of households can recycle these
- Yoghurt pot – 74% of households can recycle these
- Plastic toys – not recycled because they are made of hard plastic



For East Riding of Yorkshire, the answers are:

Yes:

Plastic takeaway container,
Plastic bottle, Plastic bag,
Plastic fruit box, Yoghurt
pot.

No:

Fruit box film, Crisp packet,
Coffee cup, Toothpaste
tube, Polystyrene packing,
Bubble wrap, Plastic toys.



1. It has been estimated that nearly 5 billion plastic straws are thrown away in England each year – TRUE astonishingly.
2. 25% of Europe's plastics are used once and then thrown away – FALSE, the actual figure is 40%.
3. There are 39 different recycling schemes in the UK – TRUE and there are plans to rationalise this.
4. Over half of the councils in the UK recycle plastic bags – FALSE only 18% of households in the UK have access to recycling for carrier bags.
5. It is ok to make a mistake and put something wrong in the recycling bin – FALSE, contamination is one of the reasons why items become less economically effective
6. You have to wash or rinse all plastic items before you put them in the recycling – TRUE, this links to the contamination point above.
7. Black plastic cannot be recycled – FALSE, many areas won't recycle black plastic because it doesn't show up on conveyor belts. It is however recyclable but is worth less as cannot be made into other colours.
8. Symbols with the three arrows and a number mean that it is recyclable – FALSE, these numbers just refer to the chemical resin used to make the plastic. For more see <https://encounteredu.com/discover/images/seven-types-of-plastic>.
9. Approximately 13 billion plastic bottles are used each year in the UK – TRUE, that's nearly 200 per person.
10. Less than half of plastic bottles are recycled in the UK – FALSE, it's not that bad, but only just at 57%, which means that 15 million plastic bottles are still sent to landfill, incinerated or littered every day.



Consider changing the East Riding example for your Local Authority. Items that can be placed in domestic recycling can normally be found on council websites.

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HOW CAN WE DEAL WITH ALL THE PLASTIC WASTE?

Step Guidance

Resources

4
15
mins



Step 4 broadens out students' thinking about whether tinkering with recycling rates is enough or whether a rethink of economic models is enough.

- Hand out Student Sheet 4b to each student. The Student Sheet contains a diagram (shown on slide 37) and a cartoon (shown on slide 38).
- Ask students to complete the questions.
- Review the answers using the relevant slides.
- Use slide 39 to prompt students to think about how small actions can help move towards an economy with less waste.



Often the production of multi-use items, e.g. a cotton tote bag, has a much higher environmental impact than that of its plastic alternative. For instance, a cotton tote bag needs to be reused 130 times to have the same global warming impact as a plastic bag. The key here is reuse.

Slideshow 4:
Slides 36-39

Student Sheet 4b:
A new economy

5
10
mins



End the lesson, by moving from statistics and facts to an artistic response to the issue of plastics.

- Introduce the work using the text on slides 40-42.
- Show students the photos on slides 43 and 44, giving students time to reflect for at least a minute on each photo in silence.
- Gather responses and ask how the photos have altered how they feel about plastic waste as opposed to the facts they have learnt earlier in the lesson.

Slideshow 4:
Slides 40-44

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Students study a wider context of waste management.

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