

Lesson plan

People throw away thousands of tonnes of waste and rubbish each year, because they no longer need or want the objects.

We throw away objects made using raw materials that will eventually run out. Making these objects also uses energy, producing CO₂ emissions which are harmful to the environment.

We are currently producing more waste than ever before. It is important that we consider carefully the materials we choose to make products with and what we do with them after they have been used.

**Lesson time
60 minutes**

Resources you will need

- ✓ The upper key stage two lesson two presentation
- ✓ For activity one
 - + Bin outlines for lower ability children to use instead of drawing their own, if required (included at the end of this document)
- ✓ For activity two
 - + A variety of objects placed around the classroom – including items where materials could be reduced, objects that could be reused and objects that could be recycled
 - + Worksheet for each pair of students (included at the end of this document)

Lesson two**SLIDE 2 — Learning objective**

Explain to the class that we are going to be thinking about how reducing, reusing and recycling material has a positive impact on the environment.

Ask what 'properties of materials' means. Ask what categories are. Once you are happy the class understands, move to the next slide.

SLIDE 3 — What we throw away

Introduce the video (youtu.be/6BRdfan7ZVE) and discuss as a class.

**SLIDE 4 — Activity one**

Explain the different types of rubbish we create. This activity focuses on percentages, infographics and measuring. Ask the class to draw a bin (10cm tall and 5cm wide) and using a ruler and the percentages, work out the size of the space needed to represent each type of waste. For lower ability children, give them a printed bin and ask them to draw in the waste and label the percentages.

For higher ability children, ask them to also list the materials that they think can be recycled.

Explain that, on average, every household in the UK will have around 42% of rubbish that can't be composted or recycled. How could we produce less rubbish? Reducing and reusing waste would help to make that percentage smaller.

SLIDE 5 — Reduce

Ask the class what materials they can spot. How much rubbish would we have at the end of this lunch? What could be replaced to reduce the amount of rubbish – reusable drinks bottle, resealable tub for sandwiches and loose crisps perhaps from a grab bag (one piece of packaging instead of individually-wrapped portions)?

This is a great opportunity to look at the rubbish created from lunch packaging. You could ask the class to put the rubbish from their lunch into three piles – compostable, recyclable and non-recyclable. Which pile is the biggest? Alternatively, set a zero-waste lunch box challenge.

SLIDE 6 — Reuse

Suggest that one way of reducing the 42% of non-recyclable waste in a bin is by reusing or repurposing rubbish. Is it better to reuse the material if it could be recycled? Why? It uses less energy, as it is not being manufactured into something new.

SLIDE 7-11 **Recycling**

Introduce the concept of recycling. Discuss with the group how we generate energy, what CO₂ emissions are, how that affects the environment, and how we can help the environment.

This is a great opportunity to cover what can be recycled at home in your area.

SLIDE 12 **Recycling magic**

Watch the video youtu.be/qdXdSjf4oJ4



SLIDE 13-14 **Ask the class what they think has been made from steel cans, glass bottles, paper, cardboard and plastic bottles.**

Discuss how scientists have been able to develop new materials. For example, plastic is recycled to make nylon and acrylic fibres used in fleeces. Around 25 bottles are needed to make one fleece.

SLIDE 15 **Ask the class to think about how the properties of different materials make it easy for us to separate them.**

Watch the video youtu.be/fqfTQfKRVPY



Explain that the optical sorters use technology that can measure information collected by sending an infrared light through a material. This technology is used to separate different types of plastic.

SLIDE 16 **Activity two**

This activity pulls together the learning from this lesson and lesson one.

Working in pairs, children have 5–10 minutes to go around the classroom to find objects (one for each category), considering the materials they are made from, if the material could be reduced, if the object could be reused for something different or if it could be recycled.

At the end of the activity, ask the class to share examples.

SLIDE 17-18 **Summary**

Recap what they have learnt today.

Extended learning opportunities

Knowledge on new materials and irreversible changes

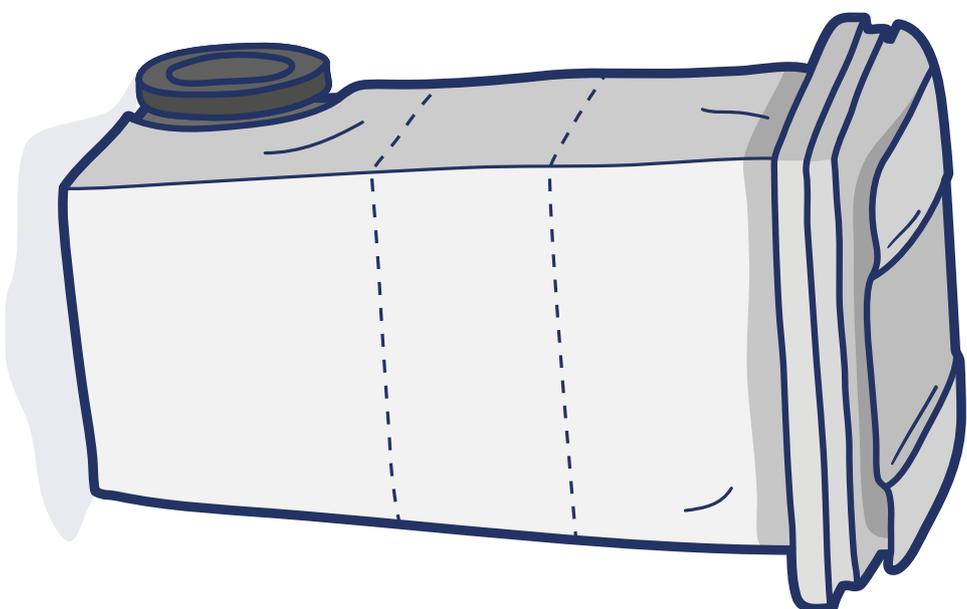
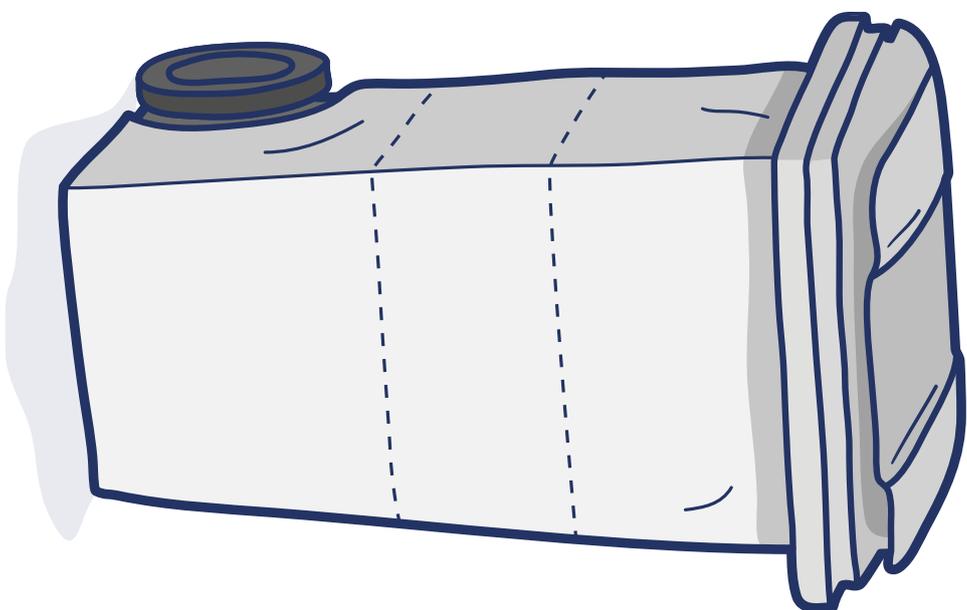
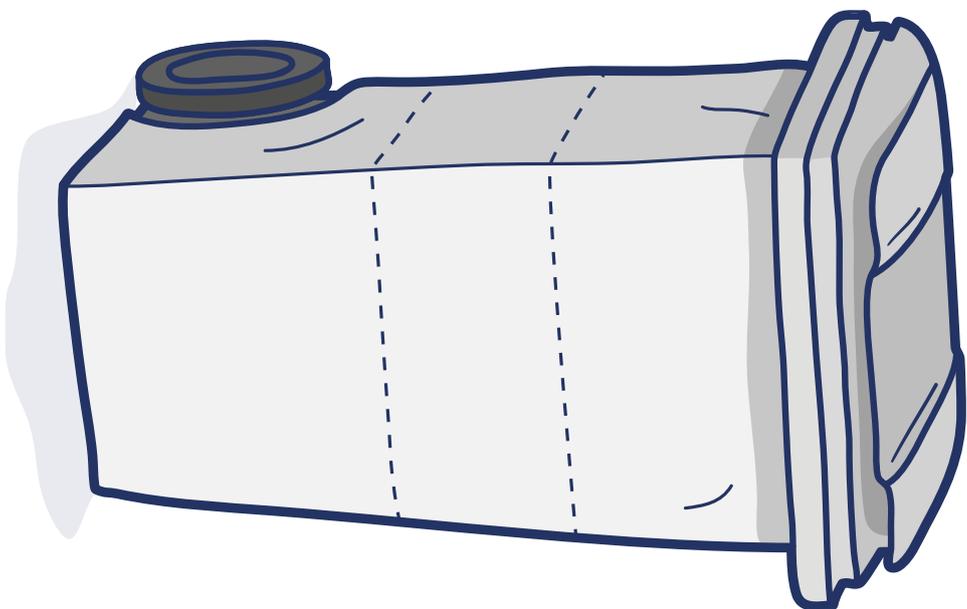
- ✓ **Ruth Benerito** – scientist who developed wrinkle-free cotton
nyti.ms/17NERxC
- ✓ **Harry Brearly** – developed non-rusting steel, known as stainless steel
design-technology.info/inventors/page5.htm

Suggested reading

- ✓ ***Energy Island - How one community harnessed the wind and changed their world*** by Allan Drummond

Properties of materials

- ✓ www.theschoolrun.com/homework-help/materials



Object	Materials and their properties	Could the materials used be reduced? How?	Could the object be reused? How?	Could the object be recycled?