

Can redesigning products help?



Age 11-14



60 minutes

Curriculum links

- Evaluate how redesigns can reduce ocean plastics.
- Analyse the product life cycle of a household object and apply learnings to a redesign.

Resources



Slideshow 5:
Can redesigning products help?



Student Sheet 5a:
Cryptogram

Student Sheet 5b:
Redesign gallery

Student Sheet 5c:
Product analysis

External Link:
Edible six pack ring

Extension or home learning

Students research sustainable designs. Pick their favourite. In 100 words students explain why they like it.

Lesson overview

In this design and technology Key Stage 3 (KS3) lesson, students learn how sustainable redesign can reduce ocean plastic waste. This lesson is focussed on students conducting a product life cycle analysis on a household object before redesigning it. Included are teacher resources that allow students to critique examples of redesigns, conduct a product life cycle assessment, and redesign a product.

Lesson steps

Learning outcomes

- | | |
|---|--|
| <p>1. Definition cryptogram (5 mins)
Students complete a cryptogram to uncover the meaning of the lesson.</p> | <ul style="list-style-type: none"> • Define redesign |
| <p>2. What is sustainable redesign? (5 mins)
Students look at an example of sustainable redesign and understand how it applies to the 6 Rs.</p> | <ul style="list-style-type: none"> • Define redesign |
| <p>3. Redesign gallery (15 mins)
Students move around the room, like a gallery, and critique redesigns, stating which of the 6 Rs each design has used.</p> | <ul style="list-style-type: none"> • Critique product redesigns |
| <p>4. Product analysis (15 mins)
Students choose one of three household items to analyse and redesign. Students analyse the product life cycle using the 6 Rs.</p> | <ul style="list-style-type: none"> • Analyse the product life cycle of a household object |
| <p>5. Redesign (10 mins)
Students choose one of three things highlighted in the assessment, which they would like to change. Students redesign the product.</p> | <ul style="list-style-type: none"> • Redesign a product |
| <p>6. Unintended consequences (10 mins)
Students discuss unintended consequences of sustainable redesign. Then students predict what unintended consequences may arise from their redesigns.</p> | <ul style="list-style-type: none"> • Critique product redesigns |

TEACHER GUIDANCE 5 (page 1 of 3)

CAN REDESIGNING PRODUCTS HELP?

Step Guidance

Resources

1
5
mins



In step 1 students decode a cryptogram to discover what they will be learning about in the lesson.

- Hand out Student Sheet 5a.
- Using slide 1, instruct students to decode the cryptogram.
- Using slides 2-4, introduce the lesson and learning outcomes.

Slideshow 5:
Slides 1-4

Student Sheet 5a:
Cryptogram



For some classes, who may not have encountered a cryptogram, you may have to model how to complete it. For these classes you can motivate them to complete it by offering a reward to the first 3 to raise their hands and show the correct answer.

Alternately, some classes may find the task simple. In which case you can stretch them by asking them to give examples of sustainable design / redesign.

2
5
mins



Introduce the importance of sustainable design using an example.

- Using slide 5, play the video.
- The video shows a redesign of the plastic 6 pack ring with an edible alternative.
- Ask students, "How is this better for the ocean?" Continue by asking students to identify which of the 6 Rs relate to this product. They ought to align this with refuse.
- You may want to go further by asking, "Do you think the edible six pack rings will be as good? Will it be as cheap to make? Could there be any unintended consequences?"

Slideshow 5:
Slide 5

External Link:
Edible six pack ring



This video is hosted on Vimeo and you may need to unblock this service, liaising with your IT department.

The link for the video is:

Edible six pack ring

<https://vimeo.com/167207255>

3
15
mins



In step 3, students explore examples of sustainable redesign and evaluate the social, economic, and environmental impacts.

- Print Student Sheet 5b and place the five models around the room. Depending on class size you may need two copies of each.
- Using slide 6, introduce the activity as a 'redesign gallery'.

Slideshow 5:
Slide 6

Student Sheet 5b:
Redesign gallery

TEACHER GUIDANCE 5 (page 2 of 3)

CAN REDESIGNING PRODUCTS HELP?

Step Guidance

Resources

- Instruct students to move around the room – like an art gallery – and critique each redesign in small groups.
- At each station, students will identify which of the 6 Rs have been applied.
- After students have been to all 5 stations, stop students and ask for their attention. Instruct them on the count of 10 to stand by their favourite design.
- Once students are in position, target students and ask them why they have chosen that product and not the others.



The art gallery is a nice method of transmission. However, some groups may find it more challenging than others. To resolve this, you can add more structure by including some gallery rules. Examples of gallery rules include:

- Always whisper to other gallery visitors.
- No more than 3 people per artwork.
- No photography or phones permitted.

4
15
mins



In step 4, students choose one of 3 household items to analyse and redesign. Students analyse the product life cycle using the 6 Rs.

- Hand out student sheet 5c.
- Using slide 7, direct students to complete the student sheet.



Ideally give students access to computers and the internet to research their product. This way they can accurately identify the materials which they are made from.

Slideshow 5:
Slide 7

Student Sheet 5c:
Product analysis

5
10
mins



Once students have analysed the product, they will have identified opportunities to redesign. This may involve changing the materials the product it is made from. It may also include making the design more modular, so it is both easier to repair and recycle.

In step 5, students apply their learnings to creating a redesign.

- Before directing students to begin their redesign you may want to ask students to share the product they have chosen and some redesign ideas they have thought of from step 4. This will support other students to make progress.
- Instruct students that they have 10 minutes to redesign their product.
- Students may complete their redesign either on paper or, if computers are available, using any suitable software.

Slideshow 5:
Slide 7

TEACHER GUIDANCE 5 (page 3 of 3)

CAN REDESIGNING PRODUCTS HELP?

Step Guidance

Resources

6
10
mins



In step 6, students are encouraged to consider the unintended consequences of their designs.

- Using slide 8, show the graph: “How many times do you need to reuse a reusable bag to make it more sustainable than a single-use carrier bag?”
- Ask students, “Are you surprised by this?” And, “Why do you think you need to reuse these items so many times?” Students should begin to think about the differences in manufacturing.
- Using slide 9, introduce the idea that some materials are better than others for a function. Refusing to use materials can impact user experience. Slide 6 shows the example of straws made from different materials. Ask students, “Which do you prefer and why?” This may develop into a debate.

Slideshow 5:
Slides 8-9



The unintended consequences of sustainable design are quite challenging to understand. This is a great opportunity to stretch students.

Slide 8 shows how many times a carrier bag must be reused to make it more sustainable than a conventional single-use plastic carrier bag. This is based on the items ‘global warming potential’ that will factor in emissions produced in the manufacture of the bags. To put it in context, a cotton carrier bag will only have contributed fewer emissions if used more than 131 times.

Slide 9 gives opportunity to discuss how the material impacts the user’s experience. Many fast food chains have moved from plastic straws to paper straws to have a more sustainable brand image. However, some people have criticised how effective the paper straws are.

More information can be found using the link below:
Environment Agency 2006:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/291023/scho0711buan-e-e.pdf

+

20
mins



Encourage students to discover designs themselves. In this task ask students to research sustainable designs. They must then find their favourite sustainable design and explain why they like it in 100 words.

Subject Update:
How to: Improve students’ online research skills