LESSON 10

Design Technology - The plastics solution

Age 7-11

60 minutes

Curriculum links

- Investigate a range of designs
- Research and develop a sustainable product

Resources

Slideshow 10:
The plastics solution

Student Sheet 10a:
Product design

Extension or home learning

Students gather materials for their prototype at home to bring in to school for the practical lesson. Alternatively, the prototype can be set as a home learning project and later shared with the class.

Lesson overview

Students discover a range of products which have been redesigned with sustainability in mind. They then consider some of the other single-use plastics they know of and choose one to redesign using a sustainable alternative. Students then develop their designs considering the materials they will use and how it will be manufactured, pitching their idea to the class and reflecting on feedback. At the end of these two lessons the students can produce a prototype.

Lesson steps	Learning outcomes
1. Single-use alternatives (10 mins) Students investigate a range of sustainable alternatives to single-use plastics and reflect on their specifications.	• Understand key events which have shaped the redesign of plastic products
2. Redesigning single-use plastics (10 mins) They then consider a range of single-use plastics and decide which to re-design focussing on sustainability.	• Research and develop an idea
3. Developing ideas (15 mins) Working in groups students model their design and develop a pitch to share with others.	• Model and communicate design ideas in a variety of forms
4. Reflect and develop (15 mins) Upon receiving feedback on their initial idea students regroup and fine tune their designs.	• Evaluate ideas against criteria and consider the views of others
5. Prototype production (10 mins) Students then create a product specification and design a prototype, researching tools and materials required for production. Populating a list of required materials.	• Select a range of tools and materials to develop a product

TEACHER GUIDANCE 10 (page 1 of 2)

Step	Guidance	Resources
1 10 mins	Step one introduces students to some recent innovations in design technology, aimed at reducing plastic use. · Remind students of the design process with Gallery: The design process, before introducing the learning outcomes. · Use slide 4 to demonstrate some alternatives to single-use plastics. · Ask students to share their reactions to these products, reflecting on the design specifications for each, such as strength, longevity, sustainability.	**Slideshow 10:** Slides 1-4
2 10 mins	· Next students review a variety of commonly used single-use plastics and decide which they will redesign. · Go through slide 5 which demonstrate a number of single-use plastics in common use today. Discuss with students the design specifications of each and how they are met, discussing cost and ease of production. · Ask students to think of any other single-use plastics and list their ideas. · Explain that although these products are very efficiently designed for their purpose, they are environmentally unsustainable. Reviewing knowledge from the whole Ocean Plastics unit task. Ask students to share what they know about why these products are unsustainable. · Students then select a single-use product and explain why they think this particular product needs redesigning.	**Slideshow 10:** Slide 5
3 15 mins	Step 3 sees students begin to develop their design idea. · Once students have selected (or you have allocated) which product they will redesign, group them accordingly so they can develop their ideas collaboratively. · Explain that students have 15 minutes to come up with an alternative design to meet the same specification. Or, an improved version of the existing product which has less environmental impact. · Use Student Sheet 10a to work through the design specification. · Explain that at the end of this time they will pitch their ideas to another group and take feedback.	**Slideshow 10:** Slide 6 **Student Sheet 10a:** Product design sheet

Step	Guidance	Resources
4 15 mins	In step 4 students share their ideas with an audience and take constructive feedback. · Ask students to join with another group and spend a few minutes talking through their design. · Explain that the audience group should give constructive feedback, such as scrutinising cost or availability of materials. Slide 7 provides guidance on the process of giving constructive feedback. The groups should then swap roles so both received feedback. · After both groups have shared and received feedback they can regroup and adapt their designs accordingly.	**Slideshow 10:** Slide 7
5 10 mins	Step 5 involves students planning what they require to make a prototype. · Using Student Sheet 10b students finalise their design, annotating and adding details. · Explain that they will then need to consider what materials they will require to construct a prototype, including any tools they will need for its construction. · Once students have populated a list for the materials and tools, they can complete Student Sheet 10a, explaining why they believe their design will be effective and how it improves on existing designs. · If you would like your students to construct their prototype you will need to allocate adequate time and budget for sourcing materials. · A follow up practical lesson will develop student's practical and construction skills. · You may wish to exhibit these prototypes or share during an assembly or parents evening. This could also coincide with the presentation at the end of lesson 8.	**Slideshow 10:** Slides 8-10 **Student Sheet 10a:** Product design