Applicable standards

National Curriculum for England Key Stage 3

KS3 Design and Technology Element of the curriculum	Lessons 1	 2	 3	 4	 5	 6
Design						
• Identify and solve their own design problems and understand how to reformulate problems given to them	✓	✓	✓	✓	✓	✓
• Use research and exploration, such as the study of different cultures, to identify and understand user needs		✓	✓	✓	✓	
• Use a variety of approaches [for example, biomimicry and user-centred design], to generate creative ideas and avoid stereotypical responses		✓	✓	✓	✓	✓
Evaluate						
• Analyse the work of past and present professionals and others to develop and broaden their understanding	✓					
• Investigate new and emerging technologies	✓					
• Understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists	✓					
• Develop specifications to inform the design of innovative, functional, appealing products that respond to needs in a variety of situations						✓
• Develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools						✓

Applicable standards

Design and Technology Progression Framework - D&TA

KS3 Design and Technology Element of the curriculum	Lessons 1	2	3	4	5	6
Designing A						
• DA2 Use research including the study of different cultures, to identify and understand user need		✓				
• DA4 Develop design specifications that include a wider range of requirements such as environmental, aesthetic, cost, maintenance, quality and safety	✓				✓	
• DA 6 Understand how to reformulate design problems given to them		✓	✓			✓
• DA 7 Work confidently within a range of relevant domestic, local and industrial contexts, such as the home, health, leisure, culture, engineering, manufacturing, construction, food, energy, agriculture and fashion		✓	✓		✓	
• DA 8 Consider the influence of a range of lifestyle factors and consumer choices when designing products				✓		
• DA 9 Take creative risks when making design decisions		✓			✓	
• DA 11 Analyse where human values may conflict and compromise has to be achieved			✓	✓		
Designing B						
• DB 6 Combine ideas from a variety of sources				✓		✓
• DB 7 Use a variety of approaches, for example biomimicry and user-centred design, to generate creative ideas and avoid stereotypical responses		✓		✓	✓	
• DB 9 Develop and communicate design ideas using annotated sketches					✓	✓
• DB 12 Give oral and digital presentations and use computer-based tools			✓			✓
Making						
• MA 8 Select appropriately from a wider, more complex range of materials, components and ingredients, taking into account their properties such as water resistance and stiffness			✓			✓
Evaluating A						
• EA 5 Test, evaluate and refine their ideas and products against a specification, taking into account the views of intended users and other interested groups		✓				✓
Evaluating B						
• EB 2 The positive and negative impact that products can have in the wider world	✓	✓	✓	✓	✓	✓
• EB 4 Products considering life cycle analysis	✓			✓		✓

Applicable standards

National Curriculum for England Key Stage 2

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

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.

Learning outcomes

- List the uses of plastics
- Discuss the importance of plastic
- Define the 6 Rs
- Evaluate the effectiveness of recycling in the UK
- Describe the life cycle of plastic

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 5d:
Waste hierarchy research

Lesson 2: Why should we recycle?

Overview

In this design and technology Key Stage 3 (KS3) lesson, students identify why they should recycle and how to encourage others to recycle more. Included are teacher resources for students to apply user centred design principles to redesign a recycling bin to encourage recycling.

Learning outcomes

- Identify what can and cannot be recycled
- Describe how you currently recycle
- Analyse trends in recycling behaviours
- Examine the different ways to recycle different materials
- Design a new method of recycling based on user centred design

Resources

Slideshow 2:
Why should we recycle?

Student Sheet 2a:
Recycling questionnaire

Student Sheet 2b:
What happens when we recycle?

Student Sheet 2c:
Design a user-centred bin

Student Sheet 2d:
Recycling diary

Gallery:
How is plastic recycled?

External Link:
The world's deepest bin

External Link:
Bottle bank arcade

Lesson 3: How do we reduce, reuse and refuse plastic products?

Overview

In this design and technology Key Stage 3 (KS3) lesson, students will learn how real-world companies have approached reduce, reuse, refuse principles. This lesson is focussed on students understanding and applying principles of reduce, reuse, and refuse. Included are teacher resources for students to design their own sustainable fashion brand where they are empowered to apply their understanding of reduce, reuse or refuse practices.

Learning outcomes

- Describe world population trend from a graph
- Recognise resources as finite
- Describe examples of how to reduce, reuse and refuse
- Interpret data and identify trends
- Create a design for a new product

Resources

Slideshow 3:
How do we reduce, reuse and refuse plastic products?

Student Sheet 3a:
Buzz stations

Student sheet 3b:
Design your own fashion label

Lesson 4: Should we repair?

Overview

In this design and technology Key Stage 3 (KS3) lesson, students learn how many products are designed to become obsolete and the impact this has on the environment. This lesson is focussed on students finding solutions to make it easier to repair products. Included are teacher resources that allow students to design a modular phone that can be updated and repaired easily.

Learning outcomes

- Describe what products can be easily repaired
- Create a modular design for easy repair
- Explain the environmental implications of products that can be easily repaired
- Define repair

Resources

Slideshow 4:
Should we repair?

Student Sheet 4a:
Modular phone information

Student Sheet 4b:
Design a modular phone

Lesson 5: Can redesigning products help?

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.

Learning outcomes

- Define redesign
- Critique product redesigns
- Analyse the product life cycle of a household object
- Redesign a product

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

Lesson 6: Design task

Overview

In this the final design and technology Key Stage 3 (KS3) lesson, students will apply their understanding of the 6 Rs. The focus of this lesson is to design an ocean friendly product. Students will work in groups to research, design, and pitch. Included are teacher resources which structure students independent and group activities.

Learning outcomes

- Define sustainable design
- Design an ocean friendly product
- Draw your product design
- Reflect and evaluate your product design

Resources

Slideshow 6:
Design task

Student Sheet 6a:
Design template

Student Sheet 6b:
Product pitch