

## Mapped against National Curriculum for England Key Stage 1

KSI Science	Lessons			
	1	2	3	4
<b>Element of the Science Programme of Study</b>				
<b>Everyday materials</b>				
<ul style="list-style-type: none"> <li>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</li> </ul>	✓	✓		
<ul style="list-style-type: none"> <li>Describe the simple physical properties of a variety of everyday materials</li> </ul>	✓	✓		
<ul style="list-style-type: none"> <li>Compare and group together a variety of everyday materials on the basis of their simple physical properties</li> </ul>	✓	✓		
<b>Animals including humans</b>				
<ul style="list-style-type: none"> <li>Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals</li> </ul>			✓	
<ul style="list-style-type: none"> <li>Identify and name a variety of common animals that are carnivores, herbivores and omnivores</li> </ul>			✓	
<b>Living things and their habitats</b>				
<ul style="list-style-type: none"> <li>Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</li> </ul>			✓	✓
<ul style="list-style-type: none"> <li>Identify and name a variety of plants and animals in their habitats, including microhabitats</li> </ul>			✓	
<ul style="list-style-type: none"> <li>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food</li> </ul>			✓	
<b>Working Scientifically</b>				
<ul style="list-style-type: none"> <li>Ask simple questions and recognising that they can be answered in different ways</li> </ul>	✓	✓	✓	✓
<ul style="list-style-type: none"> <li>Observe closely, using simple equipment</li> </ul>	✓			
<ul style="list-style-type: none"> <li>Perform simple tests</li> </ul>	✓			
<ul style="list-style-type: none"> <li>Identify and classify</li> </ul>	✓		✓	
<ul style="list-style-type: none"> <li>Use their observations and ideas to suggest answers to questions</li> </ul>	✓			
<ul style="list-style-type: none"> <li>Gather and record data to help in answering questions</li> </ul>	✓			

# Applicable standards

## National Curriculum for England Key Stage 1

<b>KS1 Geography</b>		<b>Lessons</b>			
<b>Element of the Science Programme of Study</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	
<b>Location knowledge</b>					
<ul style="list-style-type: none"> <li>Name and locate the world's seven continents and five oceans</li> </ul>		✓	✓	✓	
<b>Human and physical geography</b>					
<ul style="list-style-type: none"> <li>Use basic geographical vocabulary to refer to key physical features, including beach, cliff, coast, forest, hill, mountain, sea, ocean, river, soil, valley, vegetation, season and weather</li> </ul>		✓	✓	✓	
<ul style="list-style-type: none"> <li>Use basic geographical vocabulary to refer to key human features, including city, town, village, factory, farm, house, office, port, harbour and shop</li> </ul>		✓	✓	✓	
<b>Geographical skills and fieldwork</b>					
<ul style="list-style-type: none"> <li>Use world maps, atlases and globes to identify the United Kingdom and its countries, as well as the countries, continents and oceans studied at this key stage</li> </ul>		✓	✓	✓	

<b>KS1 English</b>		<b>Lessons</b>			
<b>Element of the Science Programme of Study</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	
<b>Spoken language</b>					
<ul style="list-style-type: none"> <li>Listen and respond appropriately to adults and their peers</li> </ul>	✓	✓	✓	✓	
<ul style="list-style-type: none"> <li>Ask relevant questions to extend their understanding and knowledge</li> </ul>	✓	✓	✓	✓	
<ul style="list-style-type: none"> <li>Articulate and justify answers, arguments and opinions</li> </ul>	✓	✓	✓	✓	
<ul style="list-style-type: none"> <li>Give well-structured descriptions, explanations and narratives for different purposes, including for expressing feelings</li> </ul>	✓	✓	✓	✓	
<ul style="list-style-type: none"> <li>Maintain attention and participate actively in collaborative conversations, staying on topic and initiating and responding to comments</li> </ul>	✓	✓	✓	✓	
<ul style="list-style-type: none"> <li>Use spoken language to develop understanding through speculating, hypothesising, imagining and exploring ideas</li> </ul>	✓	✓	✓	✓	
<ul style="list-style-type: none"> <li>Participate in discussions, presentations, performances, role play, improvisations and debates</li> </ul>	✓	✓	✓	✓	
<ul style="list-style-type: none"> <li>Consider and evaluate different viewpoints, attending to and building on the contributions of others</li> </ul>	✓	✓	✓	✓	

# Applicable standards

## Next Generation Science Standards

Grade 2 Science and Engineering	Lessons			
	1	2	3	4
<b>Element of the curriculum</b>				
<b>Structure and Properties of Matter</b>				
<b>2-PS1-1.</b> Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.	✓			
<b>2-PS1-1.</b> Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.	✓			
<b>Interdependent Relationships in Ecosystems</b>				
<b>2-LS4-1.</b> Make observations of plants and animals to compare the diversity of life in different habitats.		✓		
<b>Engineering Design</b>				
<b>K-2-ETS1-1.</b> Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.			✓	
<b>K-2-ETS1-2.</b> Develop a simple sketch, drawing, or physical model to illustrate how the shape of an object helps it function as needed to solve a given problem.			✓	
<b>K-2-ETS1-3.</b> Analyze data from tests of two objects designed to solve the same problem to compare the strengths and weaknesses of how each performs.			✓	

# SCHEME OF WORK

## Lesson 1: What are plastics?

### Overview

This lesson introduces students to a range of materials and allows them to compare and describe their properties. Students develop their understanding of what is meant by materials and investigate four in particular; wood, metal, glass and plastic. They then discover why certain materials are chosen to make different products. Focussing in on plastic, students explore the variety of items which are made of or contain plastic. They then conduct an investigation to find out which material is the most effective at waterproofing.

### Learning outcomes

- Identify, classify and describe a range of materials
- Explain why materials are used in different ways
- Identify a variety of items made from plastic
- Investigate which materials are most waterproof
- Summarise some of the everyday uses for plastic

### Resources



**Slideshow 1:**  
What are plastics?



**Activity Overview 1a:**  
Waterproofing investigation



**Student Sheet 1a:**  
Waterproofing investigation

## Lesson 2: Where are plastics?

### Overview

In this lesson students consider what happens to their rubbish once they have disposed of it. They discover the route a plastic bottle might take to landfill, recycling or ending up as litter. Students then go on to discover how plastic bottles can be recycled and the new products that can be made. They discuss what happens to plastic that isn't disposed of responsibly, then make posters instructing how to recycle and keep a rubbish and recycling diary to monitor their recycling at home.

### Learning outcomes

- Understand what happens to rubbish when it is thrown away
- Discover the products that can be made from recycling plastic
- Consider where discarded plastic might end up if not disposed of responsibly
- Create a poster instructing how to recycle
- Keep a rubbish and recycling diary to monitor their own recycling

### Resources



**Slideshow 2:**  
Where are plastics?



**Student Sheet 2a:**  
Rubbish and recycling diary

# SCHEME OF WORK

## Lesson 3: What impact can plastic have?

### Overview

Students discover what happens to plastic when it ends up in the ocean by exploring some of the examples of how plastic pollution affects marine life. They look at simple ocean food chains and discuss the impact of plastic pollution on these species and their habitats. Students choose a food chain to recreate and write warnings about how plastic litter can affect the species in their food chain. They conclude by considering how they could reduce the amount of plastic they use such as reusable bags and avoiding straws.

### Learning outcomes

- Understand how plastic can enter the ocean
- Discover some of the ways this impacts marine life
- Discuss how food chains are affected by plastic pollution
- Create an ocean food chain model with warnings about plastic pollution
- Consider how to reduce the amount of plastic used

### Resources



**Slideshow 3:**  
What impact can plastic have?



**Student Sheet 3a:**  
Warning cards

**Student Sheet 3b:**  
Postcard

## Lesson 4: What can I do?

### Overview

Students discover the 6Rs and discuss what each one means. They then make suggestions of how they could do each one. Students then complete one of three art projects which not only reuse plastic rubbish but also informs others how they can help fight marine plastic pollution. The completed projects could be displayed around the school or showcased in an assembly.

### Learning outcomes

- Understand what is meant by the 6Rs
- Explain how each of the 6Rs can be implemented
- Complete an art project demonstrating how to fight marine plastic pollution
- Share learning with a wider audience

### Resources



**Slideshow 1:**  
What can I do?



**Activity Overview 4a:**  
Jellyfish in a bottle

**Activity Overview 4b:**  
Plastic fish

**Activity Overview 4c:**  
Lava lamp

## Mapped against National Curriculum for England Key Stage 2

KS2 Geography	Lessons									
	1	2	3	4	5	6	7	8	9	10
<b>Element of the Geography Programme of Study</b>										
<b>Human and physical geography</b>										
<ul style="list-style-type: none"> <li>Describe and understand key aspects of physical geography, including: climate zones, biomes and vegetation belts, rivers, mountains, volcanoes and earthquakes, and the water cycle</li> <li>Human geography, including: types of settlement and land use, economic activity including trade links, and the distribution of natural resources including energy, food, minerals and water</li> </ul>			✓	✓		✓	✓	✓		
<b>Geographical skills and fieldwork</b>										
<ul style="list-style-type: none"> <li>Use maps, atlases, globes and digital/computer mapping to locate countries and describe features studied</li> </ul>					✓					

KS2 English	Lessons									
	1	2	3	4	5	6	7	8	9	10
<b>Element of the English Programme of Study</b>										
<b>Spoken language</b>										
<ul style="list-style-type: none"> <li>Listen and respond appropriately to adults and their peers</li> <li>Ask relevant questions to extend their understanding and knowledge</li> <li>Articulate and justify answers, arguments and opinions</li> <li>Give well-structured descriptions, explanations and narratives</li> <li>Maintain attention and participate actively in collaborative conversations</li> <li>Use spoken language to develop understanding through speculating, hypothesising, imagining and exploring ideas</li> <li>Participate in discussions, presentations, performances, role play, improvisations and debates</li> <li>Consider and evaluate different viewpoints, attending to and building on the contributions of others</li> </ul>	✓	✓	✓	✓	✓	✓	✓	✓		
	✓	✓	✓	✓	✓	✓	✓	✓		
	✓	✓	✓	✓	✓	✓	✓	✓		
	✓	✓	✓	✓	✓	✓	✓	✓		
	✓	✓	✓	✓	✓	✓	✓	✓		
	✓	✓	✓	✓	✓	✓	✓	✓		
	✓	✓	✓	✓	✓	✓	✓	✓		

KS2 Mathematics	Lessons									
	1	2	3	4	5	6	7	8	9	10
<b>Element of the Mathematics Programme of Study</b>										
<b>Statistics</b>										
<ul style="list-style-type: none"> <li>Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs</li> </ul>				✓						

# Applicable standards

## National Curriculum for England Key Stage 2

KS2 Design and technology	Lessons									
	1	2	3	4	5	6	7	8	9	10
<b>Element of the Design and Technology Programme of Study</b>										
<b>Design</b>										
<ul style="list-style-type: none"> <li>Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups</li> </ul>									✓	✓
<ul style="list-style-type: none"> <li>Generate, develop, model and communicate ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design</li> </ul>									✓	✓
<b>Make</b>										
<ul style="list-style-type: none"> <li>Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately</li> </ul>										✓
<ul style="list-style-type: none"> <li>Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities</li> </ul>									✓	✓
<b>Evaluate</b>										
<ul style="list-style-type: none"> <li>Investigate and analyse a range of existing products</li> </ul>									✓	✓
<ul style="list-style-type: none"> <li>Evaluate ideas and products against design criteria and consider the views of others to improve work</li> </ul>									✓	✓
<ul style="list-style-type: none"> <li>Understand how key events and individuals in design and technology have helped shape the world</li> </ul>										✓

# SCHEME OF WORK

## Lesson 1: What are plastics? Part one

### Overview

In this lesson students investigate the properties of materials and develop an understanding of why plastic is so widely used due to its versatility. They learn how plastic is produced and then go on to investigate which material is most effective for the purpose of insulation. The lesson concludes with an overview of the historical development of plastics where students identify significant events on a timeline.

### Learning outcomes

- Match materials to their properties
- Understand the process of plastic production
- Describe why plastic is chosen over other materials
- Investigate which materials are the best insulators
- Review the historical development of plastics
- Reflect on why plastic is a versatile material

### Resources



**Slideshow 1:**  
What are plastics? Part one



**Activity Overview 1a:**  
Insulation investigation



**Student Sheet 1a:**  
Materials card match

**Student Sheet 1b:**  
Insulations investigation

**Student Sheet 1c:**  
Innovation diary



**Gallery:**  
PET bottle production



**Thinglink:**  
Global plastics production

## Lesson 2: What are plastics? Part two

### Overview

In this lesson students continue to investigate different types of plastics, so that by the end of these first two lessons they are familiar with the seven types of plastic and what they are used for. Students identify why each type of plastic is well suited to its use. They go on to complete a practical to create their own plastic slime using borax and PVA glue (creating a polymer) and reflect on the variety of uses for plastics.

### Learning outcomes

- Understand how to identify the seven types of plastic
- Describe the plastic production process
- Describe the plastic recycling process
- Create a polymer
- Reflect on sustainable alternatives to plastic

### Resources



**Slideshow 2:**  
What are plastics? Part two



**Activity Overview 2a:**  
Making plastic



**Student Sheet 2a:**  
Plastic production



**Gallery:**  
Where does plastic come from?

**Gallery:**  
How is plastic recycled?



**Thinglink:**  
Seven Types of plastic



# SCHEME OF WORK

## Lesson 3: Where are plastics? Part one

### Overview

In this lesson students follow the life-cycle of a PET bottle. Using Google Maps, students track the journey of a plastic bottle during its lifetime and map the possible outcomes of where it ends up. Students go on to discover how plastic is recycled into other plastics. They then reuse a plastic bottle by completing a craft activity where they make a snack box or bird feeder. It may be possible to organise a speaker to join this lesson, some local authorities offer schools programmes or outreach workshops.

### Learning outcomes

- Explore what happens to a plastic bottle after its first and only use
- Map the journey of a plastic bottle from production to recycling or litter
- Understand the recycling process
- Demonstrate how single use plastics can be reused
- Explore alternative uses for a range of discarded plastics

### Resources



**Slideshow 3:**  
Where are plastics? Part one



**Activity Overview 3a:**  
Google maps

**Activity Overview 3b:**  
Bird feeder

**Activity Overview 3c:**  
Snack box



**Student Sheet 3a:**  
Life cycle of a plastic bottle



**Gallery:**  
How is plastic recycled?



**Thinglink:**  
Life cycle of a plastic bottle

## Lesson 4: Where are plastics? Part two

### Overview

In this lesson students discover some of the incredible uses for plastic and reflect on why single-use plastics have become unpopular. Students examine data from a sample of litter collected at Henderson Island. They go on to work out how and where the plastic litter could have come from and create a bar graph representing this data.

### Learning outcomes

- Examine data from Henderson Island
- Create a bar graph demonstrating the amount of plastic litter collected
- Explore important uses of plastic
- Create a poster demonstrating the pros and cons of plastics
- Reflect on societies needs / wants related to plastics

### Resources



**Slideshow 4:**  
Where are plastics? Part two



**Student Sheet 4a:**  
Henderson Island



**Gallery:**  
Fantastic plastic

## Lesson 5: What impact can plastic have? Part one

### Overview

In this lesson students are introduced to microplastics and ocean plastic pollution and begin to understand how and why it occurs through investigating one of three case studies. They go on to discover some of the dangers plastic pollution and microplastics can pose to marine life and consider how entire food webs are impacted.

### Learning outcomes

- Understand ocean plastic pollution statistics
- Investigate different ways plastic pollution affects marine life
- Explore three case studies related to ocean plastic pollution
- Understand the impact of microplastics on food webs
- Reflect on how plastic pollution impacts the wider food web

### Resources



**Slideshow 5:**  
What impact can plastic have? Part one



**Activity Overview 5a:**  
Food webs



**Student Sheet 5a:**  
Plastic pollution case studies



**Gallery:**  
Marine plastic pollution

**Gallery:**  
Coral life (advanced)

# SCHEME OF WORK

## Lesson 6: What impact can plastic have? Part two

### Overview

This lesson sees students investigate how plastics get into the oceans and affect marine life. Students discover how plastic pollution doesn't start when plastic enters the ocean. They go on to consider economic, political and social elements of human geography that impact ocean plastic pollution. Students examine case studies relating to plastic pollution at home and abroad to consider the social and economic impacts.

### Learning outcomes

- Understand how plastics get into the ocean ecosystem
- Describe three ways in which ocean plastic pollution can occur
- Discover some of the ethical and social issues related to ocean plastic pollution
- Discuss and describe how plastics pollution is linked to economics, human rights and sustainability
- Reflect on the sustainable development goals

### Resources



**Slideshow 6:**  
What impact can plastic have? Part two



**Student Sheet 6a:**  
Plastic impact case studies

**Student Sheet 6b:**  
Plastic profiles

**Student Sheet 6c:**  
The sustainable development goals



**Gallery:**  
Marine plastic pollution

## Lesson 7: What can I do? Part one

### Overview

The last two lessons in this unit challenge students to work collaboratively to create a campaign based on the 6 Rs. First students find out about innovation, development and policy changes that have recently occurred. They are then briefed on their mission – to reduce the amount of plastic consumption in their school community. In groups students then design and implement their campaign, planning and launching it over the following week.

*An interim lesson can follow this lesson for students to continue to work on their campaigns, measure progress, make changes and / or work on promoting their cause. They might wish to conduct surveys during this time, analyse their data and make promotional materials.*

### Learning outcomes

- Name the 6 Rs and explain what each one means
- Understand developments in technology and innovation regarding plastics pollution
- Discover how recent policy has been proposed and enacted relating to plastics pollution
- Reflect on how they can make a difference
- Work collaboratively to plan a plastics pollution campaign

### Resources



**Slideshow 7:**  
What can I do? Part one



**Student Sheet 7a:**  
Our plastics project

## Lesson 8: What can I do? Part two

### Overview

In the last lesson students review the success of their campaign and the impact it had on plastic consumption. They review their targets, reflect on what went well and decide what they would do differently. They then share their results and discuss what they could do going forward. The unit of work could end with an assembly for students to share their findings and continue to spread their message.

### Learning outcomes

- Review the impact of their campaign
- Reflect on achievements and challenges
- Share their findings and results with a wider audience
- Discuss what they plan to do next

### Resources



**Slideshow 8:** What can I do? Part two

## Lesson 9: Design Technology - The plastics problem

### Overview

In this lesson students are posed with a problem; they need to design a product which can carry a number of items from one location to another. They should attempt to design a new product and consider its features including strength, usability and materials. Students go on to evaluate existing solutions to this product in terms of strength, cost, aesthetics, usability and sustainability. Finally, they conclude by evaluating whether a new product is required or whether there are already suitable alternatives.

### Learning outcomes

- Understand design criteria
- Develop and communicate ideas
- Discuss purpose, function and appeal of products
- Investigate and analyse a range of existing products
- Evaluate ideas and products

### Resources



**Slideshow 9:**  
The plastics problem



**Student Sheet 9a:**  
Solutions sheet

**Student Sheet 9b:**  
Product analysis



**Thinglink:**  
What's your bag?

## Lesson 10: Design Technology - The plastics solution

### Overview

Students explore 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 focussing on sustainability. 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 students can produce a prototype.

### Learning outcomes

- Understand key events which have shaped the redesign of plastic products
- Research and develop an idea
- Model and communicate designs in a variety of forms
- Evaluate ideas against criteria and consider the views of others
- Select a range of tools and materials to develop a product

### Resources



**Slideshow 10:**  
The plastics solution



**Student Sheet 10a:**  
Product design