

Summer – Cycle A – UKS2

Prior Learning - EYFS

- exploring the properties of materials and sorting them into groups
- develop their understanding of everyday materials and properties by learning and using vocabulary, including hard, rough, soft and smooth

Prior Learning – KS1

- distinguish between an object and the material from which it is made
- identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock
- describe the simple physical properties of a variety of everyday materials
- compare and group together a variety of everyday materials on the basis of their simple physical properties

Prior Learning – LKS2

- compare how things move on different surfaces
- notice that some forces need contact between 2 objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others
- compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials
- describe magnets as having 2 poles
- predict whether 2 magnets will attract or repel each other, depending on which poles are facing

Project: <u>Properties and Changes of Materials</u>	Learning Objective	Skills	Knowledge	Resources
Engage Lesson 1	To explore and sort a range of materials compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity	Comparing and grouping materials.	All materials can be described using their properties. Properties are the way that the material feels, reacts to other materials or the state of matter. Materials can be described as solid, liquid or gas. These are the three main states of matter.	•

Be Brave, Be
Curious, Be Kind

Lesson Breakdown - Science



	(electrical and thermal), and response to magnets			
Develop Lesson 2	<p>To understand the use of different materials</p> <p>compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</p> <p>give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p>	<p>Exploring and investigating different materials and their properties.</p>	<p>Materials are selected for use in the world due to their properties. Different uses for materials require different properties for them (e.g. sponges need to be absorbent)</p>	<ul style="list-style-type: none"> •
Develop Lesson 3	<p>To understand which materials are the best insulators and conductors of heat</p> <p>compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</p>	<p>Asking scientific questions.</p> <p>Applying scientific knowledge to support in carrying out scientific investigations.</p>	<p>Materials that are good insulators of heat do not allow heat to travel through them easily. Materials that are good conductors of heat allow heat to travel through them easily.</p>	

Be Brave, Be
Curious, Be Kind

Lesson Breakdown - Science



<p>Develop Lesson 4</p>	<p>To understand which materials are the best insulators and conductors of electricity</p> <p>compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets</p>	<p>Asking scientific questions.</p> <p>Applying scientific knowledge to support in carrying out scientific investigations.</p>	<p>Like with heat, materials that are good insulators of electricity do not allow electricity to travel through them easily. Materials that are good conductors of electricity allow electricity to travel through them easily.</p>	
<p>Develop Lesson 5</p>	<p>To test the solubility of different materials</p> <p>know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p>	<p>Plan and carry out an investigation on given materials</p> <p>Record findings</p> <p>To suggest further investigations and predict likely outcomes of these</p>	<p>When a material is soluble, it dissolves in a liquid to form a solution.</p>	
<p>Develop Lesson 6</p>	<p>To explore different independent variables when dissolving a range of materials</p> <p>know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p>	<p>Plan and carry out an investigation on given materials</p> <p>Record findings</p> <p>To suggest further investigations and predict likely outcomes of these</p>	<p>Independent variable = what is purposefully changed Dependent variable = what the change will effect Control variable = what will be kept the same for fair testing</p>	

Be Brave, Be
Curious, Be Kind

Lesson Breakdown - Science



	demonstrate that dissolving, mixing and changes of state are reversible changes			
Develop Lesson 7	To understand how different materials can be separated. use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	Plan and carry out an investigation on given materials Record findings To suggest further investigations and predict likely outcomes of these	There are different ways to separate materials. This can be affected by the size or state of matter of the materials being separated (e.g. filtration being used to separate a solid from a liquid)	
Develop Lesson 8	To explore reversible changes know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution demonstrate that dissolving, mixing and changes of state are reversible changes	Plan and carry out an investigation on given materials Record findings To suggest further investigations and predict likely outcomes of these	Reversible changes are changes to a material that can be undone. The material can return to its initial state.	•
Develop Lesson 9	To explore irreversible changes explain that some changes result in the formation of new materials, and that	Plan and carry out an investigation on given materials Record findings	Irreversible changes are when a new material is formed and therefore the original materials will never return to their initial state.	•

Be Brave, Be
Curious, Be Kind

Lesson Breakdown - Science



	this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda	To suggest further investigations and predict likely outcomes of these		
Innovate Lesson 10	To investigate the best material to use for food packaging give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments.	Materials are selected for use in the world due to their properties. Different uses for materials require different properties for them (e.g. sponges need to be absorbent)	•
Innovate Lesson 11	To investigate the best material to use for food packaging give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations. Identifying scientific evidence that has been used to support or refute ideas or arguments.	Materials are selected for use in the world due to their properties. Different uses for materials require different properties for them (e.g. sponges need to be absorbent)	•

Be Brave, Be
Curious, Be Kind

Lesson Breakdown - Science



	use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating			
Express Lesson 12: Assessment	To be able to recall knowledge from this project.	n/a	n/a	n/a

Links within other projects:	Learning Objective	Skills	Knowledge

Key Vocabulary:							
absorption accuracy accuracy comparable	comparative conductor enquiry	fair test hardness insulator	line graph material non-porous	opaque opinion/fact porous	precision prediction property	reasoning scatter graph strength	thermal transparent variables