

## Materials Progression map Year 5

Previous Year: Year 4	Current Year: Year 5	Next Year: KS3
<ul style="list-style-type: none"> <li>• Compare and group materials together, according to whether they are solids, liquids or gases.</li> <li>• Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C).</li> <li>• Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> <li>• Recognise some common conductors and insulators, and associate metals with being good conductors. (Y4 - Electricity)</li> </ul>	<ul style="list-style-type: none"> <li>• 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.</li> <li>• Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</li> <li>• Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</li> <li>• Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.</li> <li>• Demonstrate that dissolving, mixing and changes of state are reversible changes.</li> <li>• Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical reactions as the rearrangement of atoms.</li> <li>• Representing chemical reactions using formulae and using equations</li> <li>• Combustion, thermal decomposition, oxidation and displacement reactions.</li> <li>• Defining acids and alkalis in terms of neutralisation reactions.</li> <li>• The pH scale for measuring acidity/alkalinity; and indicators.</li> </ul>
<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p>Physical education links:</p> <p>-</p> </div>	<div style="border: 1px solid black; padding: 5px; width: fit-content;"> <p><u>Learning Values:</u></p> <ul style="list-style-type: none"> <li>-respect</li> <li>-responsible</li> <li>-resourceful</li> <li>-resilient</li> <li>-risk taker</li> </ul> </div>	

Stimulus for teaching

The Borrowers by Mary Norton

George's Marvellous Medicine by Roald Dahl & Quentin Blake

Kensuke's Kingdom by Michael Morpurgo

Itch by Simon Mayo

How this learning can be applied:

- Investigate the properties of different materials in order to recommend materials for particular functions depending on these properties e.g. test waterproofness and thermal insulation to identify a suitable fabric for a coat.
- Explore adding a range of solids to water and other liquids e.g. cooking oil, as appropriate.
- Investigate rates of dissolving by carrying out comparative and fair test.
- Separate mixtures by sieving, filtering and evaporation, choosing the most suitable method and equipment for each mixture.
- Explore a range of non-reversible changes e.g. rusting, adding fizzy tablets to water, burning.
- Carry out comparative and fair tests involving non-reversible changes e.g. What affects the rate of rusting? What affects the amount of gas produced?
- Research new materials produced by chemists e.g. Spencer Silver (glue of sticky notes) and Ruth Benerito (wrinkle free cotton).

Key learning for the topic:

Materials have different uses depending on their properties and state (liquid, solid, gas). Properties include hardness, transparency, electrical and thermal conductivity and attraction to magnets. Some materials will dissolve in a liquid and form a solution while others are insoluble and form sediment.

Mixtures can be separated by filtering, sieving and evaporation.

Some changes to materials such as dissolving, mixing and changes of state are reversible, but some changes such as burning wood, rusting and mixing vinegar with bicarbonate of soda result in the formation of new materials and these are not reversible.