

Y5 –Properties and changes in materials

Inspiration **Partnership with parents**

<p>Key Questions</p> <ul style="list-style-type: none"> - How can I sort the different objects according to their properties? - Which substances will dissolve in a liquid and how can I recover these back? - How can mixtures be separated? - What are everyday uses for metals, woods and plastics? - What are reversible changes? - What are irreversible changes? 	<p>Working Scientifically</p> <ul style="list-style-type: none"> - planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary - taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate - recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs - using test results to make predictions to set up further comparative and fair tests - reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and 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. 	<ul style="list-style-type: none"> - Also covered in: . -Everyday materials and uses of everyday materials in Y1+2 -Y4- states of matter
<p>By the end of this unit children will be able to:</p> <ul style="list-style-type: none"> - compare and group together everyday materials. - explain that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution - to explain how mixtures might be separated. - give uses for everyday materials, including metals, wood and plastic - demonstrate that dissolving, mixing and changes of state are reversible changes - explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible,. 		

Knowledge
Describing the properties of an object

- Solubility- the ability of the material being able to be dissolved in a liquid. (the solute- the substance dissolves in a solvent , the liquid)
- Transparency- this assesses whether the object is see through or not.
- Opaque- if an object is opaque no light passes through them.
- Conductivity- the degree to which the objects material will conduct electricity.

-Salt is soluble in water, when salt is added to water most of it dissolves to make a solution. When sand is added to water it either hangs in the water or forms a layer at the bottom of the container. Sand therefore does not dissolve in water and is insoluble. It is easy to separate sand and water by filtering the mixture. Salt can be separated from a solution through evaporation. The water can also be recovered as well as the salt if the water vapour is trapped and cooled to condense the water vapour back into a liquid. This process is called distillation.

When a substance **dissolves**, it might look like it has disappeared, but in fact it has just mixed with the water to make a transparent (see-through) liquid called a **solution**. Substances that dissolve in water are called **soluble substances**. Substances that do not dissolve in water are called **insoluble substances**.

Mixtures can be separated by sieving, filtering and evaporating.

A mixture made of solid particles of different sizes, for example sand and gravel, can be separated by **sieving**.

You can separate a mixture of sand and water by passing it through a piece of **filter paper**. The water is able to pass through the tiny gaps in the paper but the sand particles are too big and are left on the surface of the filter paper.

By dissolving salt in water you make a **solution**. You can separate the salt from the water again by boiling the solution. The water will evaporate until it is all gone. The salt will be left behind.

A reversible change is a change that can be undone or reversed. If you can get back the substances you started the reaction with, that's a reversible reaction.A reversible change might change how a material looks or feels, but it doesn't create new materials. Examples of reversible reactions include dissolving, evaporation, melting and freezing.

A change is called irreversible if it cannot be changed back again.In an irreversible change, new materials are always formed. Sometimes these new materials are useful to us.

Heating can cause an irreversible change. For example you heat a raw egg to cook it. The cooked egg cannot be changed back to a raw egg again.

Mixing substances can cause an irreversible change. For example, when vinegar and bicarbonate of soda are mixed, the mixture changes and lots of bubbles of carbon dioxide are made. These bubbles and the liquid mixture left behind, cannot be turned back into vinegar and bicarbonate of soda again

Burning is an example of an irreversible change. When you burn wood you get ash and smoke. You cannot change the ash and smoke back to wood again.

<p>Topic Specific Vocabulary</p> <p>Dissolving, separating, mixtures, reversible, irreversible, heating, cooling, burning, material properties, material uses, hardness, solubility, transparency, conductivity, dissolve, solution, freezing, melting, soluble, insoluble, sieving, filtering, evaporation,</p>	<p>NC Subject content</p> <ul style="list-style-type: none"> - 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 - know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution - use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating - give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic - demonstrate that dissolving, mixing and changes of state are reversible changes - 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
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Subject Specific/Academic Vocabulary

This vocabulary should be explicitly taught in context. Other tier 2 words should also be explored as they are encountered.

Year 3	Year 4	Year 5	Year 6
Benefit, impact, issues, occur, process, sequence, source, variables	Appropriate, consequences, identified, procedure, range, relevant, significant, specific, theory, transfer	Factors, affect, analyse, contribute, demonstrate, outcome, react, volume,	Component, exclude, function, imply, initial, justify, sufficient.

We are scientists

