

Properties and changes of materials

Knowledge organiser

Year 5

Properties of materials

Materials have different **properties** that help us describe them and decide how they can be used.



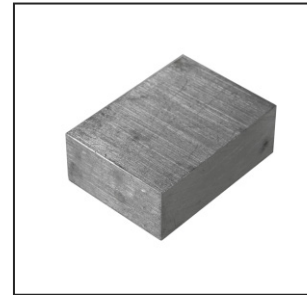
We can investigate materials to determine their properties, such as **hardness**, **flexibility**, **transparency**, **magnetism**, and whether they are **waterproof**.

Transparent	Opaque
	

Sorting materials into groups based on their properties can help us decide which are best to use.

States of matter

Solids, **liquids** and **gases** are the three states of matter.



Solids keep their shape.



Liquids flow and take the shape of their container.



Gases spread out to fill all available space.

Reversible changes of state



solid



liquid



gas

Reversible changes of state include **melting**, **freezing**, **evaporating** and **condensing**, and these changes can be undone.

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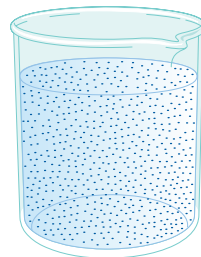
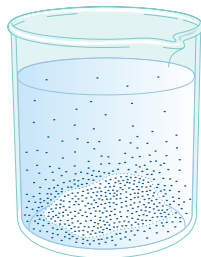
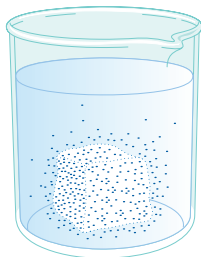
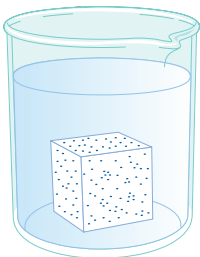
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Mixtures and solutions

What is a mixture? A mixture is formed when two or more materials are combined without changing each other. The particles stay separate, which can include large pieces, small grains, insoluble solids or dissolved particles in a solution.



What is a solution? A solution forms when a solid dissolves in a liquid. The particles become so small that they spread out evenly and cannot be seen.



Separating mixtures – reversible changes

Sieving separates large pieces from smaller grains using holes of different sizes.



Filtering separates insoluble solids from liquids using filter paper that traps the solid particles.



Evaporation separates dissolved solids from a solution by heating the liquid so it evaporates, leaving the solid behind.

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Irreversible changes

Reversible changes can be undone because the material is still the same, but irreversible changes cannot be undone because the material has changed into something new.

Burning

When something burns, it turns into new things such as ash and smoke, and it cannot return to what it was before. This makes burning an irreversible change.



Cooking

Cooking changes food so it looks, smells and feels different, and once it is cooked, it cannot return to its raw state. This means cooking is an irreversible change.



Chemical reactions

In some cases, materials mix and form something new, such as a colour change or the formation of bubbles. Because the new material cannot be changed back, this is an irreversible change.



Key vocabulary

 classify	 clear	 cloudy	 compare
 conclusion	 evidence	 flexible	 hard
 material	 measure	 melt	 mixture
 object	 observe	 prediction	 property
 rigid	 separate	 sieve	 soft
 solution	 temperature	 variable	