

Properties and Changes of Materials

Significant Scientist

Hypatia



Hypatia (355-415AD) a famous Greek mathematician who also studied the properties of liquids and discovered that elements can take different forms (ice/water/steam) but still be the same element.

Ahmed Zewail



Ahmed Zewail (1946-2016) known as the father of femtochemistry, which is the study of chemical reactions over very short periods of time. He was the first Egyptian scientist to win a Nobel prize.

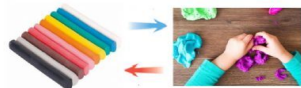
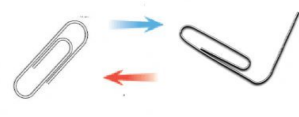
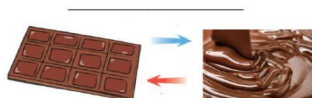
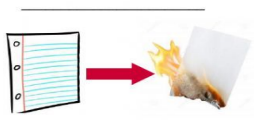
Enquiry Skills

Observing over time

Grouping and classifying

Fair testing

Pattern seeking



Key Knowledge

When the particles of a solid mix with the particles of a liquid, they either combine with the liquid and the result is a solution (this is called dissolving and we say the solid is soluble) or the particles do not mix or dissolve. We say the solid is insoluble.

Some materials can be separated after they have been mixed based on their properties - this is called a reversible change.

Some methods of separation include the use of a magnet, a filter (for insoluble materials), a sieve (based on the size of the solids) and evaporation, e.g. The Water Cycle.

Melting and heating are examples of reversible changes.

A filter can be made of paper, charcoal or other material with tiny holes in it.

When a mixture cannot be separated back into original components, it is called an irreversible change.

Burning or mixing a liquid with bicarbonate of soda are examples of irreversible changes.

Working Scientifically Skills

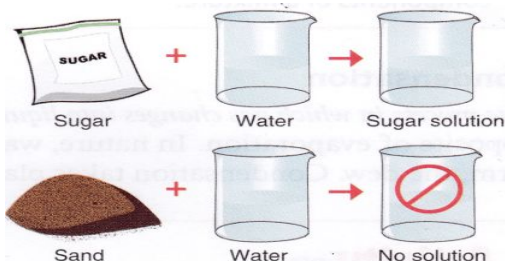
Plan

Measure

Fair test

Report data – scientific diagrams, labels, bar graphs and line graphs.

Present – conclusions, casual relationships, explanations.



Key Vocabulary

dissolve	When a substance is mixed with a liquid and becomes incorporated into the liquid so as to form a solution.
soluble	Able to be dissolved.
insoluble	Impossible to dissolve.
solution	A mixture that contains two or more substances combined.
filter	A device used to remove impurities or other particles from liquids or gases.
evaporate	To turn from liquid into gas; pass away in the form of vapour.
reversible change	A change that can be undone or reversed. When you can get back the substances the reaction started with.
irreversible change	A change that cannot be changed back again. New materials are formed from a change.

Changes of State

