Whingate Primary School – Science

Properties of changing materials

Year 5

What should I already know?

-Identify and compare the suitability of a variety of everyday materials.
-Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.
-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.
-Compare and group materials together, according to whether they are solids, liquids or gases.
-Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens.
-Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

What will I know by the end of this unit?

Different materials are suitable for different jobs because of their qualities and properties. E.g. rubber is a good material for tyres because it is **durable.**

Dissolving Materials

When particles of a solid mix with particles of a liquid, this is called dissolving. The result is a solution.

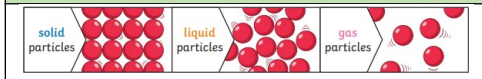
Separating Materials

Evaporation – used to separate a soluble solid and a liquid.
Sieving – used for separating two solids.
Magnets – used for separating magnetic and non-magnetic materials.
Filtration – used for separating a liquid and a solid.

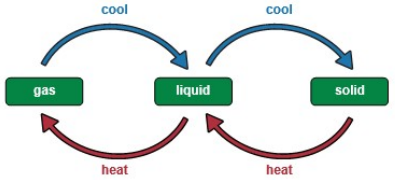
What are electrical insulators and conductors?

An electrical conductor lets electricity pass through it. They are often metal,

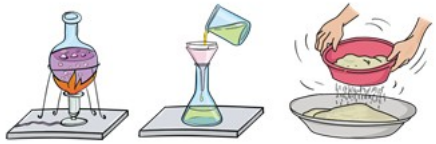
materials: The substance that something is ma of, e.g. wood, plastic, metal.
soluble: a material that dissolves in a liquid, such as sugar.
insoluble: a material that does not dissolve in a liquid, such as sand.
solution: a mixture that contains two or more substances evenly.
solids: one of the three states of matter. Solid particles are very close together, meaning solids, such as wood and glass, hold their shape.
liquid: a substance that flows freely and can be measured by volume, e.g. water or oil.
gases: a state of matter that have no defined shape or volume.
melting: The process of heating a solid until it changes into a liquid.
freezing: When a liquid cools and turns into a solid.
evaporation: When a liquid turns into a gas or vapour. A process used for separating a soluble solid and a liquid.
filtration: used for separating a solid and a liquid.
sieving: used for separating two solids.
permeable: a substance that gas or liquid can pass through.
insulator: a material that does not let heat or electricity travel through them.
conductor: a material that heat or electricity can travel through easily. Most metals are both thermal and electrical conductors.
reversible: Can get the original materials back.
irreversible: Can't be reverse back to its original state.



States of matter can change when they are heated or cooled.



Separating Materials



Reversible Changes

making ice cubes mixing sugar in tea

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Irreversible Changes

Compare and group together everyday materials based on their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.
Explain that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.
Predict and test how different 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.
Investigate reversible and irreversible chemical changes.

Famous Scientist/Inventors

Ahmed Zewail (1946-2016)

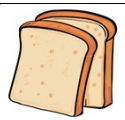
e.g. iron, copper and gold but also include carbon and water. An insulator does not let electricity pass through it, e.g. wood, leather or plastic**.**

What are thermal insulators and conductors?

Materials which are good thermal conductors allow heat to move through them easily. Thermal do not let heat travel through them easily, e.g. flasks or woollen.

Reversible and irreversible changes

Some materials can be separated after they have been mixed based on their properties – this is called a reversible change. When a mixture cannot be separated back into the original components – this is called an irreversible change.



making toast

baking a cake

Stephanie Kwolek (1923 – 2014)

Antoine Lavoisier (1743 – 1794)