

Properties and Changes of Materials

Properties of materials

The properties of a material refer to its appearance, behaviour and structure, for example, whether it is hard or soft, rigid or flexible. There are a variety of ways the properties of materials can be tested.

Property	Test
hardness	Squeeze the material between two fingers. If the material squashes, it is soft.
magnetism	Test the material with a magnet. If the material is attracted towards it, it is magnetic.
transparency	Shine a torch through a sample. If all the light shines through the material, it is transparent. If some of the light shines through, it is translucent. If none of the light shines through, it is opaque.
electrical conduction	Add the material to a simple series circuit containing a lamp and battery. If the lamp lights up, the material is an electrical conductor.
thermal conduction	Warm the material between two hands and place on thermochromic sheet, which changes colour when it is heated. If the sheet changes colour, the material is a thermal (heat) conductor.



Metals

A metal is a solid material that conducts heat and electricity and that is often hard, strong and shiny. The properties of a metal determine its uses. Electrical wiring, for example, is made from copper because it is a very good conductor of electricity. Precious metals, such as gold and silver, are expensive and decorative so they are used to make jewellery.

Metal	Properties	Uses
 gold (Au)	shiny yellow, malleable, non-magnetic, good conductor of electricity and heat	jewellery, wire, money, tooth fillings, electrical components
 silver (Ag)	shiny, malleable, non-magnetic, excellent conductor of electricity and heat	jewellery, mirrors, cutlery, ornaments, money
 iron (Fe)	dull, strong, malleable, magnetic, good conductor of electricity and heat, rusts easily	bridges, railings, machinery, steel production
 copper (Cu)	shiny reddish-brown, malleable, non-magnetic, excellent conductor of electricity and heat	wiring, motors, coins, piping

Separating Materials

SIEVING – A way to separate two solids of different sizes (e.g. flour and raisins).

FILTRATION – A mixture of liquids and solids which haven't dissolved can be filtered using paper with tiny holes (e.g. sand and water).

EVAPORATION – A solid dissolved in a liquid (solution) can be heated. Liquid evaporates and leaves behind the solid (e.g. salt and water solution).

MAGNETISM – Metal attracts to the magnet, leaving behind the other solid (e.g. paper clips and matchsticks).



Reversible & Irreversible Changes

In a reversible change the materials change back to how they were before. In an irreversible change the materials can't change back to how they were before.



Melting Chocolate

Melting chocolate is an example of a **reversible change**.



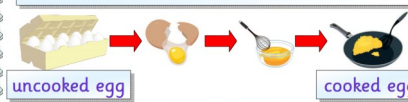
chocolate bar → melted chocolate → chocolate

The chocolate **melts** as it is **heated** then **solidifies** as it **cools**. This change is **reversible**.

www.communication-hall.co.uk

Cooking Eggs

Cooking eggs is an example of an **irreversible change**.



uncooked egg → cooked egg

It does not matter how the egg is cooked, the change will always be **irreversible**.

www.communication-hall.co.uk

Owl Term 3 2019-20

Science Knowledge

Organiser