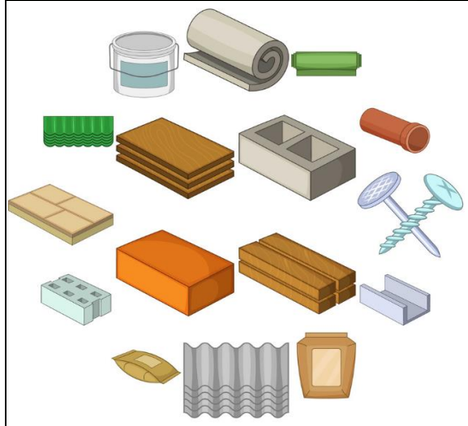
PROPERTIES AND CHANGES OF MATERIALS

Assessment Question: What are the different ways to separate a mixture and a solution?

Y5

What you should already know...



-Materials are the substances that things are made from.

-The properties of materials make them useful for different purposes.

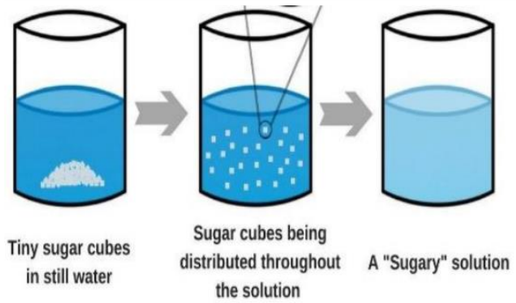
-Materials have more than one property and can be natural or man-made. Properties can include the hardness, whether it conducts electricity, the shininess, or whether it is magnetic.

-There are three main states of matter – solids, liquids, and gases.

-The state of matter of materials can change, through processes such as freezing and melting.

Key Vocabulary		
solubility	reversible/irreversible	transparency
solute	conductivity	filtering
solvent	change of state	solution
evaporating	dissolve	sieving

Dissolving



Sometimes when a solid (solute) is mixed with a liquid (solvent) it will dissolve to form a solution e.g., dissolving sugar in hot tea.

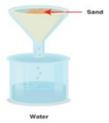
The solid seems to disappear in the solution but it is still there it has just become part of the liquid.

A soluble material can dissolve, however, an insoluble material cannot dissolve.

Separating mixtures

SEPARATING MIXTURES

SIEVING – a mixture of different sized solid particles can be separated with a sieve.



FILTERING – an insoluble solid can be separated from a liquid when passed through a filter. The liquid passes through the solid particles are trapped on the filter.

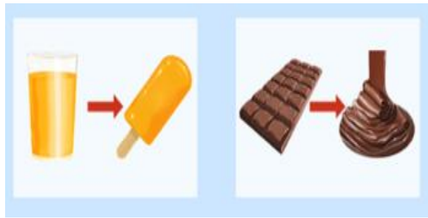
EVAPORATING – if a solution is boiled (heated) the water will evaporate into gas and the solid will be left behind.

Grouping Materials by Properties

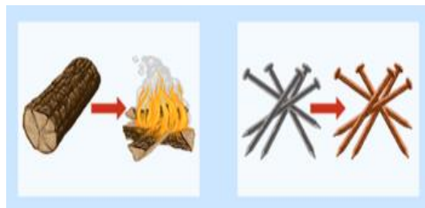
PROPERTY	YES	NO
ELECTRICAL CONDUCTOR	Copper, aluminum, gold, silver, steel, sea water	Glass, air, plastic, rubber, wood, oil, diamond
MAGNETIC	Steel, nickel, cobalt, iron, uranium, platinum	Paper, glass, plastic, rubber, wood, wool
TRANSPARENT	Glass, water, clear plastic	Wood, rubber, oil, steel, copper, iron, silver
WATERPROOF	Plastic, rubber, metal, glass	Tissue, sponge, fabric

Reversible and Irreversible Changes

REVERSIBLE CHANGES



IRREVERSIBLE CHANGES



-There are many ways in which materials can be changed, for example through heating, cooling, or mixing with other substances.

-Some changes can be reversed (e.g. the material can be returned to its previous form). These are known as reversible changes. An example of this is the freezing of water into ice – it can be melted to become water again.

-Other changes are irreversible. This means that that the changes cannot be 'undone.' Examples of this include cooking, baking, frying and burning materials. For example, you can fry a raw egg to cook it. You can't return it back to a raw egg again.

- Changes that involve the formation of new materials (e.g. mixing cement) are not normally reversible.

Reversible Changes

Dissolving

Mixing

Changes of State

Burning

Rusting

Irreversible Changes

Decaying