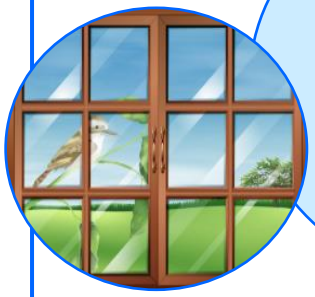
Harting C of E Primary School – Science

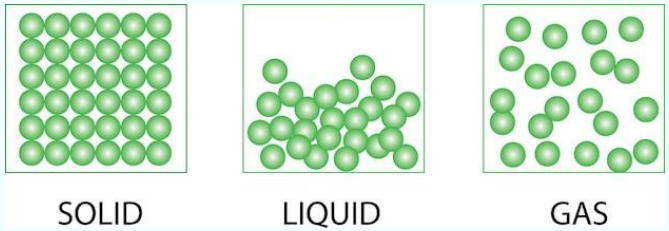
Topic: Properties of Changing Materials	Oak Class	Autumn 1

Key Information

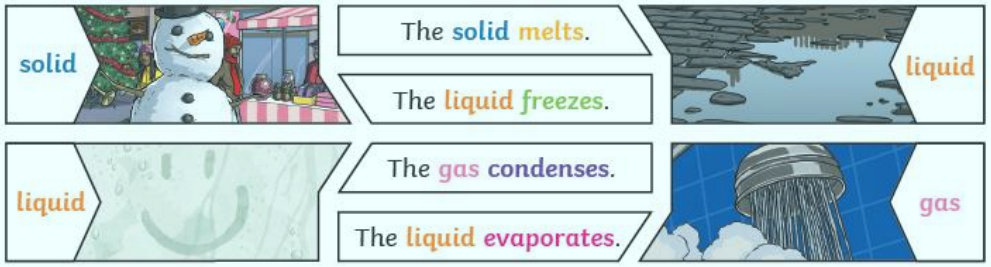
Different materials are used for particular jobs based on their properties: electrical conductivity, flexibility, hardness, insulation ability, magnetism, solubility, thermal (heat) conductivity, transparency.



For example, glass is used for windows because it is hard and **transparent**. Oven gloves are made from a thermal **insulator** to keep the heat from burning your hand.



Changes of State



Vocabulary

material	The substance that something is made out of e.g. wood, plastic, metal.
solid	One of the *three* states of matter. The particles in solids are very close together, meaning solids, such as wood and glass, hold their shape.
liquid	One of the *three* states of matter. A liquid can flow and take the shape of its container. Examples of liquids include water and milk.
gas	One of the *three* states of matter. The particles in gases are further apart than those in solids or liquids and they are free to move around. A gas fills its container, taking both the shape and the volume of the container. Examples of gases are oxygen and helium.
melting	The process of heating a solid until it changes into a liquid.
freezing	When a liquid cools and turns into a solid e.g. ice.
evaporating	When a liquid turns into gas or vapour e.g. steam.
condensing	When a gas, such as water vapour, cools and turns into a liquid e.g. rain.
conductor	A conductor is a material that heat or electricity can easily travel through.
insulator	An insulator is a material that does not let heat or electricity travel through it.
dissolve	A solid substance mixes with a liquid to form a transparent substance called a solution.
soluble	A substance that can dissolve in a liquid.
insoluble	A substance that cannot dissolve in a liquid.
reversible	A change that can be undone e.g. melting ice
irreversible	A change that cannot be undone e.g. boiling an egg.

Key Information

Reversible changes, such as mixing and dissolving ***solids*** and ***liquids*** together, can be reversed by:

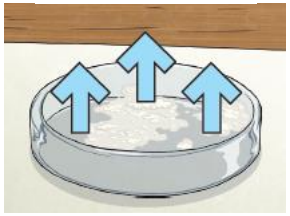
Sieving

Smaller ***materials*** are able to fall through the holes in the sieve, separating them from larger particles.

Filtering

The ***solid*** particles will get caught in the filter paper, but the ***liquid*** will be able to get through.

Evaporating



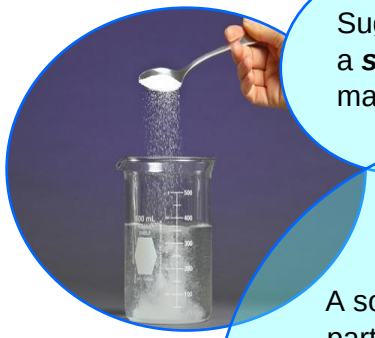
The ***liquid*** changes into a ***gas***, leaving the ***solid*** particles behind.

Irreversible changes often result in a new product being made from the old ***materials*** (reactants). For example, burning wood produces ash. Mixing vinegar and milk produces casein plastic

Top Takeaways

After studying this topic you should be able to:

- Compare and group together everyday materials based on their properties, including their solubility and response to magnets.
- Identify thermal and electrical conductors and insulators.
- Identify materials that are soluble or insoluble in water.
- Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporation.
- Explain that some changes form new materials and that this change is irreversible.
- Predict what will happen in an investigation.
- Make observations.



Sugar is a ***soluble*** material.

Dissolving

A solution is made when solid particles are mixed with liquid particles. Materials that will dissolve are known as soluble. Materials that won't dissolve are known as insoluble. A suspension is when the particles don't dissolve.

Sand is an ***insoluble*** material.

Working scientifically (Science Skills)

i) planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary

ii) taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate

iii) recording results using scientific diagrams and labels, tables, scatter graphs, bar and line graphs

v) reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations

vi) identifying scientific evidence that has been used to support or refute ideas or arguments