

Properties and Changes of materials

Properties of materials

All objects are made from materials. Different materials have different properties.

For example:

- hard or soft
- stretchy or not stretchy
- rough or smooth
- bendy or not bendy
- opaque or transparent
- waterproof or not waterproof
- absorbent or not absorbent
- strong or not strong
- magnetic or not magnetic
- reflective or non-reflective
- electrically conductive or electrically non-conductive
- thermally conductive or thermally non-conductive
- soluble or insoluble

Reversible changes can be reversed or changed back to recover the original materials. They are physical changes, which means no new materials are formed, and recovered materials are the same, even if they look or feel different. Reversible changes happen between the three main states of matter: solids, liquids and gases. Melting, freezing, evaporation, condensation and dissolving are all reversible changes.

Irreversible changes cannot be reversed or changed back to recover the original materials. They are chemical changes that form new materials. Several processes cause irreversible changes, including cooking, burning, rusting, decaying and chemical reactions. Signs of irreversible changes include the production of a gas, a sound, a smell or light. The temperature, colour and smell can also change.

Vocabulary

absorbent	To be able to take in or soak up another material.
chemical reaction	A process when two or more materials react together to make new materials.
conduct	Able to let heat or electricity pass through.
filter	A device that removes small solid particles from a liquid or gas, by not permitting the solid particles to pass through.
solute	A dissolved substance, such as salt.
solution	A mixture in which the solute and solvent particles are evenly spread out, such as seawater.
solvent	A substance that dissolves a solute, such as water



mixture of soil and water

A **mixture** is a combination of two or more substances that aren't chemically joined and can be separated into their individual substances. There are two types of mixtures: heterogeneous and homogeneous.

Key scientific processes



Solubility is a measure of a material's ability to dissolve. When a material dissolves it disappears and becomes incorporated into another material. The material that dissolves is called the solute. The material it dissolves into is called the solvent. When the solute has dissolved in the solvent, it is known as a solution. A material that can dissolve is described as soluble. A material that cannot dissolve is described as insoluble.



Dissolving can also happen with other states of matter. Air is a mixture of dissolved gases. Carbon dioxide gas is dissolved into liquids to make drinks fizzy.



Sieving

A sieve is a mesh that separates solids from liquids or large solid particles from smaller solid particles. This mixture of oats and milk can be separated by sieving

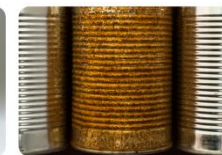


Filtration

Filtration is a way of separating very small solid particles mixed with liquids or gases using a filter. Filters can be made from thin materials, such as filter paper, which contain tiny holes, or from layers of solid materials, such as sand, gravel or charcoal. This mixture of ground coffee beans and water can be separated by filtering.



burning



rusting



decaying



chemical reaction