

Materials and their properties

In this unit, pupils will explore the properties and reactions of different materials.

Background information

- Some materials are good at keeping in heat (insulating), others have good transparency (glass) others are long lasting such as plastic.
- By heating and cooling certain materials, it is possible to determine what they can and can't do.
- By mixing, heating or cooling materials, it is also possible to discover new materials.
- Some changes are permanent (irreversible) however, some changes can be reversed (reversible).
- Solids, liquids and gases are the three main categories of materials.



Knowledge and Understanding

In this unit pupils will learn:

- Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- Understand that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- Use knowledge of solids, liquids and gases to decide how 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
- Demonstrate that dissolving, mixing and changes of state are reversible changes
- Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible.

Enquiry skills and Key concepts

In this unit, the pupils will:

- Plan different types of enquiry to answer questions.
- Recognise and control variables where necessary.
- Choose and use a range of scientific equipment with increasing accuracy and precision.
- Collect data and make their own decisions about what observations to make, what measurements to use, and how long to make them for.
- Choose how to record data and results including tables and bar and line graphs.
- Present findings (in oral and written forms).
- Make predictions to set up further comparative and fair tests. Gather evidence to prove or disprove these predictions.
- Improve their results to identify when further tests and observations might be needed

Key Vocabulary:

Conclusion: a summary of how your results support or contradict your original idea.

Conductor: a material that permits the flow of energy such as electricity or heat (electrical and thermal).

Dissolve: incorporate into a liquid to form a solution.

Evaporate: turn from a liquid into a vapour.

Filter: pass (a liquid, gas, light or sound) through a device to remove unwanted material.

Gas: an air-like fluid substance which can fill any space.

Insoluble: does not dissolve in liquid.

Investigate: to carry out a detailed exploration in order to find out about something.

Liquid: a substance that flows freely but has a constant volume

Observe: to watch something attentively.

Particles: a tiny portion of matter.

Solid: a firm and stable shape.

Soluble: dissolves into liquid (to form a new solution).

Solution: a liquid mixture in which the minor component (the solute such as salt) is distributed within the major component (the solvent such as water).