

Do you need to see something to believe in it?

SCIENCE



National Curriculum Links:

Properties and changes of materials

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.

Know 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, including changes associated with burning and the action of acid on bicarbonate of soda.

Essential Prior Learning:

Materials have different properties.

Different solutions can be created by mixing two substances.

An electrical conductor is a material that lets electricity pass through it easily.

Evaporation is the process in which a liquid turns to a gas.

Scientific questions can be answered through observations and investigations.

A fair test involves keeping as many things the same as possible and only changing one thing – the variable – at a time.

Progression in Skill:

Plan different types of scientific enquiries to answer scientific questions, including recognising and controlling variables where necessary.

Use test results *or observations* to make predictions to set up further comparative and fair tests.

Make systematic and careful observations

Collect, gather, record data and results of increasing complexity using scientific diagrams and labels, tables, scatter graphs, bar and line graphs.

Identify scientific evidence that has been used to support or refute ideas or arguments.

Report and present 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, e.g. The ___-er the ___, the ___-er the ____.

Read, spell and pronounce simple scientific vocabulary correctly.

Long-term Memory Knowledge:

Materials and solutions can be separated using sieving, filtering and evaporation.

Melting, freezing and boiling are reversible changes.

Some changes are irreversible, e.g. burning and cooking.

Key Vocabulary

reversible	something which can be undone/reversed
irreversible	something which cannot be undone/reversed
state	describes what form – solid, liquid, gas - matter is in
soluble	whether a solid is able to dissolve in a liquid

thermal conductivity	allowing heat to travel through easily
chemical reaction	when two or more substances combine to form a new substance – the original substances cannot be retrieved
dissolve	a substance is mixed with a liquid and become part of the liquid – a reversible change
filtering	removing small particles of insoluble or undissolved material from a liquid, usually by using a barrier with very small holes such as filter paper
sieving	a mixture made of solid particles of different sizes, for example sand and gravel, can be separated by sieving
evaporation	the process of a liquid becoming a gas due to being heated

Progression in Resources:

Filter paper
Sieves
Bunsen burner
Funnel
Beaker
Test tubes

Relevance

Now	Children know that some changes are reversible and some are irreversible, and some processes for separating materials.
Future	Children apply knowledge of separating materials and reversible/irreversible changes to everyday life, for example, in the kitchen.
Aspiration	Learners are inspired to pursue a career in science and STEM, particularly girls who are currently underrepresented.