



Materials (Chemistry)

Year 5

End Points:

- Materials can be grouped according to their properties.
- A property is something that describes a material.
- Some properties are visible; others can be found by testing.
- Thermal conductivity means heat can be transferred through a material.
- Materials are selected for uses that suit their properties.
- A solution is a mixture of a solid in a liquid.
- Dissolving is a process where one substance becomes incorporated with another to form a solution.
- A solvent is a substance that can dissolve other substances.
- Some substances are soluble; some are not.
- There are methods for separating mixtures: sieves, filters, magnetism, evaporation.
- All changes are either reversible or irreversible.

This unit builds on prior knowledge from Key Stage One, where children began to learn about materials and their properties. Children began to think about how the properties of materials link to their uses.

The National Curriculum requires children to have a good understanding of the properties of materials, how some materials can dissolve into a liquid and how this process can be reversed to recover a substance from a solution. It also requires knowledge of separation methods, including filtering, sieving and evaporating. Understanding these processes requires both taught content and investigations where children can predict, observe and conclude from what they see happening. Where possible, with the materials you have available, add to the plans to offer practical opportunities for children to apply what they have learned.

In this unit, children will revisit the concept of conductivity. They will look at the most suitable material for thermal conductivity and will analyse different materials and their properties. After revisiting this knowledge, children will move on to studying solubility; which materials are soluble and what it means to be soluble. This knowledge and understanding will form a foundation of understanding of chemistry that they will build on in KS3.

Children will then take their science learning on further to look at separating mixtures through sieving, filtering and evaporating. They will work scientifically to separate a mixture using a range of tools and methods. They will learn about the scientist, Jabir ibn Hayyan, who is thought to have invented a crucial tool for the distillation process; the alembic still. Reversible and irreversible changes will be studied as children deepen their understanding of dissolving, mixing and changing state.

Lesson Sequencing:

Lesson one will explore how materials can be grouped according to their properties. Lesson two will build on this knowledge by looking at thermal conductivity of materials. In lesson three, children will look at solutions, mixtures and dissolving, building their understanding of material properties. This will be developed further in lesson four when they look at how to separate mixtures and solutions. In lesson five, children will look at whether such changes are reversible or irreversible. In the assessment lesson, children will describe how they would separate a mixture of pebbles, iron nails, salt and water, using diagrams and a written explanation.

Misconceptions:

- A material is used for clothing or building
- Thermal insulators keep cold in or out
- Thermal insulators warm things up
- Solids dissolve in liquids have vanished and you cannot get them back
- A lit candle simply melts which is reversible

Working Scientifically criteria met in this unit:

- Identifying scientific evidence that has been used to support or refute ideas or arguments
- Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- Using test results to make predictions to set up further comparative and fair tests