Sholing Junior School - Science

Topic: Properties and changes of materials	Year: 5	Strand: Chemistry

What I will learn

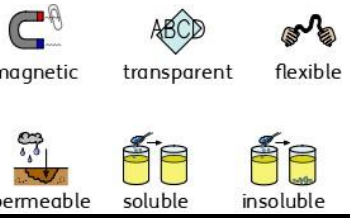
- Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets
- Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance 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.

Vocabulary

condensation	small drops of water which form when water vapour or steam touches a cold surface, such as a window
conductor	a substance that heat or electricity can pass through or along
dissolves	when a substance is mixed with a liquid and the substance disappears
evaporation	to turn from liquid into gas; pass away in the form of vapour.
filtering	a device used to remove dirt or other **solids** from **liquids** or **gases**. A filter can be made of paper, charcoal, or other material with tiny holes in it.
flexible	an object or material can be bent easily without breaking
gas	a form of matter that is neither **liquid** nor **solid**. A **gas** rapidly spreads out when it is warmed and contracts when it is cooled.
insoluble	impossible to **dissolve**, esp. in a given **liquid**.
insulator	a non-conductor of electricity or heat
irreversible	impossible to reverse, turn back, or change.
liquid	in a form that flows easily and is neither a **solid** nor a **gas**.
melting	to change from a **solid** to a **liquid** state through heat or pressure
particles	a tiny amount or small piece
permeable	of a substance, being such that **gas** or **liquid** can pass through it
process	a series of actions used to produce something or reach a goal.
properties	the ways in which an object behaves
resistance	the opposing power of one force against another.
reversible	able to turn or change back
solid	having a firm shape or form that can be measured in length, width, and height; not like a **liquid** or a **gas**
soluble	able to be **dissolved**.
solution	a mixture that contains two or more substances combined evenly
state	the structure or condition of something
temperature	a measure of how hot or cold something is
thermal	relating to or caused by heat or by changes in **temperature**
transparent	If an object is **transparent**, you can see through it
variable	something that can change or that has no fixed value
water cycle	the process by which water on the earth evaporates, then condenses in the atmosphere, and then returns to earth in the form of precipitation.

Knowledge

How to group materials based on their properties using more complex vocabulary.

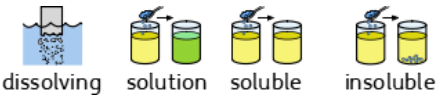


What are thermal insulators and conductors?

- **Materials** which are good **thermal conductors** allow heat to move through them easily.
- **Thermal conductors** are used to make items that require heat to travel through them easily, such as a saucepan which requires heat to travel through to cook food.
- **Thermal insulators** do not let heat travel through them easily.
- Examples of **thermal insulators** include woolen clothes and flasks for hot drinks.

What is dissolving?

- When the **particles** of a **solid** mix with the **particles** of a **liquid**, this is called **dissolving**.
- The result is a **solution**.
- **Materials** that **dissolve** are **soluble**.
- **Materials** that do not **dissolve** are **insoluble**.



Can materials be separated after they have been mixed?

- Some **materials** can be separated after they have been mixed based on their **properties**- this is called a **reversible** change.
- Some methods of separation include the use of a magnet, a **filter** (for insoluble materials), a sieve (based on the size of the solids) and **evaporation**.
- When a mixture cannot be separated back into the original components, this is called an **irreversible** change. Examples of this include when materials burn or mixing bicarbonate of soda with vinegar.

Investigate!

We will build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials and explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes. We will look at changes that are difficult to reverse, for example, burning, rusting and other reactions as well as, find out about how chemists create new materials.

We will work scientifically by: carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?' We might observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes and research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials.