Reversible & Irreversible changes

Year 5

Knowing More, Remembering More

Remembering previous learning

What is a solid? Solids have a fixed shape and volume. A solid material will keep its shape

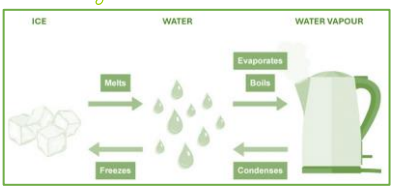
What is a liquid? Liquids have no fixed shape and will take on the shape of the container they are transferred into. The volume will remain the same.

What is a gas? Gases have no fixed shape and no fixed volume. They will spread out and fill any available space.

What is a pouring solid? Some solids, such as sand, slat, flour and rice, can be poured but they are still classified as solids.

Can some materials change state? Some materials can change state between a solid, a liquid and a gas.

What is the water cycle? When water is in constant movement through the different states of matter. Water can be a solid (ice), a liquid (water) or a gas (water vapour).



What is the process of evaporation?

The change of state from a liquid to a gas when something is heated.

What is the process of condensation?

When a gas changes state to a liquid when it is cooled.

In this unit children will:

- 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.
- 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.

Working Scientifically:

5.7 Take accurate measurements using a range of scientific equipment. Start to take repeat readings when appropriate.

5.8 Gather, record and classify data with increasing complexity to help in answering questions.

5.9 **Record data using scientific diagrams and labels, classification keys, tables, bar and line graphs.**

5.10 Report and present findings from enquiries, including conclusions.

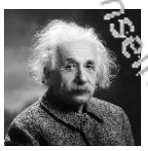
5.11 Begin to identify causal relationships in oral and written forms such as displays and other presentations.

5.12 **Make predictions for new values, suggest improvements and raise further questions.**

Key Learning Steps:

1. Dissolving
2. Separate materials - filtering and sieving
3. Solutions and evaporating
4. Reversible changes
5. Irreversible changes - burning
6. Irreversible changes - acid

Key Scientists:



Classic

Albert Einstein (1879-1955) A German-born theoretical physicist

Classic

J. Robert Oppenheimer (1904-1967) An American theoretical physicist and "father of the atomic bomb".

Vocabulary:

- dissolve
- soluble
- insoluble
- solution
- substance
- sieve
- filter paper
- mixture
- insoluble
- funnel
- filtering
- evaporation
- states of matter
- reversible change
- reverse
- chemical reaction
- irreversible change
- burning
- heating
- vinegar

Knowing More, Remembering More

Knowing more in Y5

What does soluble mean? A soluble substance can dissolve in a liquid, such as salt and sugar.

What does insoluble mean? An insoluble substance cannot dissolve in a liquid, such as sand and flour.

What is a solution? A solution is made when a substance is dissolved into a liquid.

What affects how quickly a substance dissolves? Two things. 1. Increasing the temperature of the liquid. 2. Stirring the liquid.

How can a mixture of different-sized solids be separated? By sieving.

How can an insoluble solid be separated from a liquid? By filtering.

How can a soluble solid be separated from a liquid? By evaporation.

What changes can be reversed? Dissolving, mixing and changes of state.

What are changes of state? These include: freezing, melting, evaporation and condensation.

What is a reversible change? If you can retrieve the substance that you started with, then the change is reversible.

What is an irreversible change? This is when a change cannot be undone to get the same substances back again and a new substance is made, such as burning.

What is meant by 'chemical reaction'? When a new substance is made, a chemical reaction has taken place.

What is happening when something 'fizzes'? A gas has been made.