Science

Year 5

Autumn 2

All change

Key Facts

Changes of state (such as freezing, melting, evaporating, boiling and condensing) are reversible changes brought about by changes in temperature.

Reversible changes are those in which the fundamental composition of the materials involved remains unchanged, and that by altering the conditions it is possible to return the materials to their original state.

In some cases the material may look slightly different when it is returned to its original state, but it remains the same material. Dissolving is another example of a reversible change.

The material that is dissolved, such as salt (called the solute), in another material, such as water (called the solvent), can be recovered by separating the two materials.

Sodium bicarbonate will produce carbon dioxide gas if it is mixed with vinegar or some other liquids. This is an example of a chemical reaction that is a non-reversible change.

Almost all metals corrode to some extent when they come into contact with air over a long period of time. This results from a chemical process called oxidation. If the metal contains iron, the iron reacts with oxygen in the presence of water to form a reddish coloured solid called rust.

Vocabulary

Word	Definition
Change of State	A physical **change** which appears when a substance crosses from one **state** into another.
Corrode	destroy or damage (metal, stone, or other materials) slowly by chemical action.
Dissolve	become or cause to become incorporated into a liquid so as to form a solution.
Oxidise	combine chemically with oxygen.
Reaction	a chemical process in which substances act mutually on each other and are changed into different substances, or one substance changes into other substances.
Reversible	(of a reaction) occurring together with its converse, and so yielding an equilibrium mixture of reactants and products.
Solidifies	To make solid; make into a hard or compact mass; change from a liquid or gaseous to a solid form.
Tarnish	A film or layer of discoloration on a metal surface caused by corrosion or oxidation.

Common misconceptions:

Children may think that certain solids dissolve in liquids, not recognising that a chemical change has taken place, producing carbon dioxide gas as a result, such as sodium bicarbonate or a vitamin C tablet in water.

They may think that carbon dioxide bubbles released from a bottle of lemonade when the lid is unscrewed indicate a chemical reaction. They may struggle to understand that the gas released has been dissolved in the liquid and is released because of the reduction of pressure.

They may think that only the wick of a candle burns, not recognising that the wax melts and vaporises and the gas burns, ignited by the candle flame.

Knowledge and Understanding:

Children will learn:

- To develop their knowledge and understanding of changes to materials.
- They will recognise that some changes such as melting, evaporation and dissolving are reversible while other changes are non-reversible, including burning and production of rust or a gas as the result of a chemical reaction.
- Children use specific scientific vocabulary as they describe, explain and communicate their understanding of how materials change.
- Working scientifically, children observe and compare changes that take place over time in a variety of different contexts, such as when making toffee, rusting metals or burning a candle.

Key skills and concepts:

Children will be able to:

- Working scientifically, children observe and compare changes that take place over time in a variety of ways.
- **Plan** and carry out fair tests to **investigate** more systematically non-reversible changes that they **observe**.
- **Use** a variety of ways to **report** and **present** their findings to an audience.
- Using new vocabulary to explain findings.

Key Questions

Are the changes that happen around us reversible or non-reversible?

How much gas can be produced by non-reversible change?

How long does it take for iron nails to rust?

What happens when a candle burns?

How long does it take for things to rust?

What would make the best rocket fuel?

What are the bubbles in honeycomb toffee?