



Year 4

# States of Matter

## Statutory Requirements:

- Compare and group materials together, according to whether they are solids, liquids or gases
- Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius ( $^{\circ}\text{C}$ )
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature

## Working Scientifically:

- Asking relevant questions and using different types of scientific enquiries to answer them
- Setting up simple practical enquiries, comparative and fair tests
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables

## Key Knowledge:

- There are three main states of matter which can be changed by heating or cooling.
- Solids have a shape that remains the same unless a force acts upon them.
- Liquids have no fixed shape but a volume, takes on the shape of its container.
- Gases have no fixed shape or volume and will always spread out to fill the container that they are in.
- Evaporation is a process where liquids convert to gas when heated, such as water to water vapour.
- Condensation is a process where gases convert to liquids when cooled, such as water vapour to water.

## Key Vocabulary:

- |                    |                   |
|--------------------|-------------------|
| ➤ Materials        | ➤ Degrees Celsius |
| ➤ States of matter | ➤ Evaporation     |
| ➤ Solid            | ➤ Boiling         |
| ➤ Liquid           | ➤ Condensation    |
| ➤ Gas              | ➤ Solidifying     |
| ➤ Heating          | ➤ Melting         |
| ➤ Cooling          | ➤ Water Cycle     |
| ➤ Temperature      | ➤ Water Vapour    |

## Key Scientists:



### Classic

**Alfred Barnhard Nobel (1833-1896)**

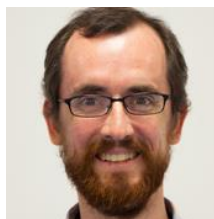
Swedish chemist, engineer and inventor of dynamite



### Contemporary

**Spencer Silver (1941-)**

Inventor of non-drying glue used on post-it notes.



### Contemporary

**Andreas Hermann (???? -)**

Discovered 'chain-melted states' in which materials are solid and liquid at the same time!



### Contemporary

**Jeffrey Karp (???? -)**

Inventor of medical glue used instead of stitches.