

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 (°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:

The three main states of matter:

Solid – shape remains the same unless a force acts upon it.

Liquid – no fixed shape but a volume, takes on the shape of its container.

Gas – no fixed shape or volume, will always spread out to fill the container that it is in.

Other states of matter also exist such as plasma and Bose-Einstein condensates.

Processes

Melting – Change from solid to liquid through applying heat.

Evaporation – Change from liquid to gas through heating.

Boiling – Rapid, forced change from liquid to gas through applying heat at or above the boiling point.

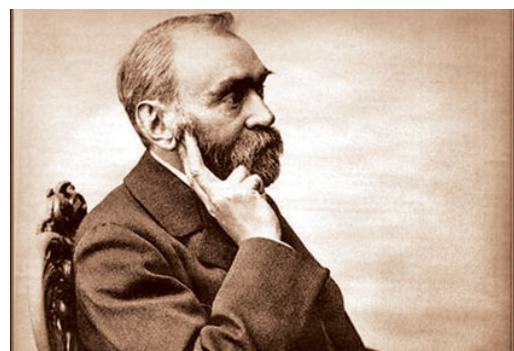
Condensation – Change from gas to liquid through cooling.

Solidifying – Change from liquid to solid through cooling.

Key Vocabulary:

- States of matter - Solid, liquid, gas
- Examples of gases (at room temperature and pressure) – Oxygen, hydrogen, helium, carbon dioxide, methane
- Examples of liquids (at room temperature and pressure) – Water, milk, juice, oil
- Examples of solids (at room temperature and pressure) – Wood, rocks, metal
- Processes – Melting, condensation, evaporation, solidifying, freezing, boiling
- Water cycle
- Water vapour, steam
- Heating, cooling

Key Scientists:



Alfred Barnhard Nobel (1833-1896)
Swedish, chemist, engineer, inventor and businessman.