

Manor Primary School Knowledge Organiser – Owls

Topic: States of matter

Phase: Lower KS2

Strand: Science (Physics)

What should I already know?

- The simple physical properties of a variety of everyday materials.
- How to identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
How to compare and group together a variety of everyday materials on the basis of their simple physical properties.
- How to find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

At the end of the unit, I will be able to:

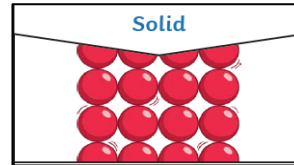
- Compare and group materials together, according to whether they are solids, liquids or gases.
- Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius (°C)
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.
- Explore a variety of everyday materials and develop simple descriptions of the states of matter (solids hold their shape; liquids form a pool not a pile; gases escape from an unsealed container).
- Observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled.

Key Knowledge

There are 3 states of matter.

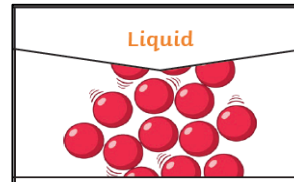
Solid – particles very close together/ vibrate around a fixed position.

Ice, wood, glass, diamond



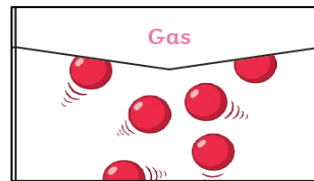
Liquid – particles close but randomly arranged / move around

Water, milk, washing up liquid



Gas – particles far apart and randomly arranged/ move around

Steam, hydrogen, carbon dioxide, oxygen



We are MANOR! As Scientists we will...

Manners

Develop a respect and understanding for the natural world, its people, animals and plants. Share ideas, celebrate good work, value others' contributions, or discussions and debates.

Aspiration

Learn by being challenged in a series of well-designed scientific enquiry and investigation tasks linked to meaningful contexts and develop a knowledge of scientists and careers to broaden our horizons. Be aspirational in developing scientific knowledge and conceptual understanding through biology, chemistry and physics.

Nurture

To recognise that we live in a wonderful world made up of many different people and living things. We will develop an appreciation and respect for the diverse world and environment in which we live, showing care and compassion for the environment around us.

Open-Mindedness

We will be open-minded so that we can conduct experiments or observe what is happening in order to see patterns that might emerge or to gain new knowledge. We will use our curiosity and learn to wonder why something behaves a certain way.

Resilience

Engage confidently with the science curriculum and learn that anything is possible and failure is not something to fear but to learn from. We will develop our scientific enquiry and investigation skills with patience and care, repeating investigations to check the accuracy of results.

Scientific Method: planning an investigation

Variables

Choose your independent variable (what you will change) and your dependent variable (what you will measure)

Question

Create your question: what is the effect of changing the (independent variable) on the (dependent variable).

Prediction

Make a prediction of what you think will happen based on what you already know.

Equipment

List all of the equipment you will use.

Method

Describe the method using numbered bullet points.

Risks

Identify any risks you must be aware of to ensure safety.

Did you know?

Antoine Lavoisier 1743 – 1794 was the scientist most noted for his discovery of the role oxygen plays in combustion. He recognized and named oxygen (1778) and hydrogen (1783).

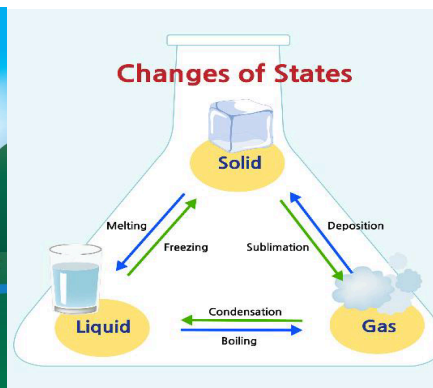
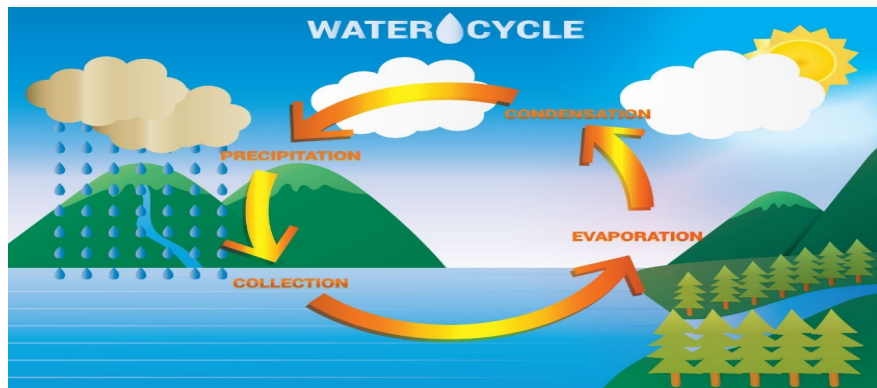
Robert Boyle 1627–1691 discovered that the volume of a gas decreases with increasing pressure and vice versa—the famous Boyle's law.

John Dalton 1766 – 1844 proposed matter is made up of atoms that are indivisible and indestructible.

Beam is another state of matter. Scientists do not fully understand them but the particles act together to achieve something, whereas solid, liquids or gases move around in a meaningless way.

[Find further information](#)

www.bbc.co.uk/bitesize/topics/zkgg87h/articles/zsgwwxs



Key Knowledge and vocabulary

States of matter	On earth, all matter exists in one of three different states.
Solid	Having a firm shape or form that can be measured in length, width, and height; not like a liquid or a gas.
Liquid	In a form that flows easily and is neither a solid nor a gas.
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.
Water Vapour	Water in the gaseous state, especially when due to evaporation at a temperature below the boiling point.
Condensation	Small drops of water which form when water vapour or steam touches a cold surface, such as a window.
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.
Precipitation	Rain, snow, sleet, dew, etc, formed by condensation of water vapour in the atmosphere.
Evaporation	To turn from liquid into gas; pass away in the form of vapour.
Melting point	The melting point of a particular substance is the temperature at which it melts.
Freezing point	The freezing point of a particular substance is the temperature at which it freezes. The freezing point of water is 0°.
Particles	A tiny amount or small piece.

States of Matter Quiz.

1. What are states of matter and how do they change?

2. Which order do events happen in the water cycle?

3. What are the similarities and differences between particles in a solid, liquid and gas?

4. Name 5 example of liquids?

5. Which scientist discovered the role of oxygen?