

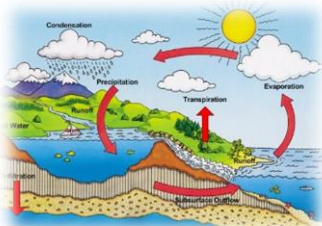


St James' Church of England Primary School

Science Overview Sheet



Year 4 – States of Matter



Rationale: Pupils should 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). Pupils should observe water as a solid, a liquid and a gas and should note the changes to water when it is heated or cooled.

Note: Teachers should avoid using materials where heating is associated with chemical change, for example, through baking or burning.

Pre-unit task: Knowledge Organiser Quizzes

Working Scientifically:

- *Grouping and classifying* a variety of different materials.
- *Exploring* the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party).
- *Researching* the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid.
- *Observing and recording* evaporation over a period of time, such as a puddle in the playground or washing on a line, and *investigating* the effect of temperature on washing drying or snowmen melting.

Statutory Requirements:

- 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.
- Measuring temperature tells us how hot or cold something is.
- Heating causes solids to melt to liquids and liquids to evaporate into gases. Cooling causes gases to condense to liquids and liquids to freeze to solids.
- Evaporation happens when water is heated/warmed and changed into a gas.
- Condensation happens when water vapour in the air turns into a visible liquid.
- Evaporation and condensation are changes that can be reversed
- The water we use has been used before.
- Evaporation and condensation are an important part in the water cycle.

Changes to materials can happen at different rates (factors affecting evaporation –temperature only – see yr5).

Overview: Learning Objectives

Lesson 1: Solid, Liquid or Gas? - I can sort and describe materials.
Lesson 2: Investigating Gases - I can investigate gases and explain their properties.
Lesson 3: Heating and Cooling - I can investigate materials as they change state.
Lesson 4: Wonderful Water - I can explore how water changes state.
Lesson 5: Evaporation Investigation - I can investigate how water evaporates.
Lesson 6: The Water Cycle - I can identify and describe the different stages of the water cycle.

Cross Curricular Links

Resources

- Thermometers • Foil pie tins • Chocolate broken into equal sized squares • Trays - 3 per group, each tray filled with a different temperature of water • Stopwatches • Plastic bottle of lemonade - 1 per group • 3-5 different fizzy drinks • Digital weighing scales • Beakers or plastic cups • Clear plastic cups - 1 per pair • Compost • Cress seeds • Cling film

Assessment

Most Children will: • Describe the properties of solids, liquids and gases. • Explain that melting and freezing are opposite processes that change the state of a material. • Identify the melting and freezing point of several different materials. • Explain that heating causes evaporation and cooling causes condensation.

Less Able Children will: • Identify the stages of the water cycle • Sort materials into solids, liquids and gases. • Explain that heating causes melting, and cooling causes freezing.

More Able Children will: • Explain the behaviour of the particles in solids, liquids and gases • Use the water cycle to explain why the water we have on Earth today is the same water that has been here for millions of years. • Set up reliable and accurate investigations.