States of Matter

Science
Knowledge organiser

Strand: Chmistry

Class: Year 4

Previous Knowledge

Properties of materials—children will know whether materials are soft, hard, waterproof, pliable etc

Project Hook or 'Wow' memory

Make your own ice-lollies

Learning Steps	Key Knowledge (answers)
Can you group these materials and objects into solids, liquids and gases? (identifying and classifying)	Solids- These are materials that keep their shape unless a force is applied to them. They an be hard, soft or even squashy. Solids take up the same amount of space no matter what happens to them Liquids -Liquids take the shape of their container. They can change shape but do not change the amount of space they take up. They can flow or be poured. Gases - Gases an spread out to completely fill up the container room hat they are in. Gases
What is the best temperature for melting chocolate? Comparative testing)	Water needs to be hot (between 86 and 90) to melt chocolate. Observe chocolate changing state - melting and solidifying
How does the mass of an ice cube change over time? (Changes over time) **How does the mass of a block of ice affect how long it takes to melt? (Fair testing)**	The mass of an ice cube stays the same—nothing is added or taken away. The state changes into water but it weighs (mass) the same. The larger the mass the longer it takes to change state.
Is there a pattern to how long it takes different sized ice lollies to melt? (Pattern spotting)	The larger the ie lolly th longer it takes to melt—link to last weeks learning. Anomalies - ice lollies / ice cream lollies
How are changes of state relevant to the water cycle? (Research)	**Water cycle processes: Rain falls (liquid) —travels through water courses to sea, evaporates water vapour rises as a gas, cools down and forms clouds (condenses)**

The key skills we want pupils to use during this topic:

Ask relevant **questions** and use different types of scientific enquiries to answer them. Set up simple practical investigations, **compare** things and make **fair tests**. Make careful **observations** and take **accurate measurements** using the right units using a range of equipment.

Gather, record, sort and **present data** in a variety of ways to help in **answering questions**. Record findings using simple **scientific language**, drawings, labelled diagrams, keys, bar charts and tables.

Report findings by talking and writing about them, displaying or **presenting results** and **conclusions**. Use results to draw simple conclusions, make **predictions**, suggest **improvements** and ask more questions. **Identify differences, similarities or changes** . Use clear **scientific evidence** to answer questions or to support my findings.

Key vocabulary

States of matter	Materials can be one of three states: solids, liquids or gases. Some materials an change from one state to another and back again
Solids	These are materials that keep their shape unless a force is applied to them. They an be hard, soft or even squashy. Solids take up the same amount of space no matter what
Liquids	Liquids take the shape of their container. They can change shape but do not change the amount of space they take up. They can flow or be poured.
Gases	Gases can spread out to completely fill up a container or room that they are in. They do not have any fixed shape but they do have mass.
Water vapour	This is water that takes the form of a gas. When water is boiled it evaporates into water vapour.
More vocab	Overleaf

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.

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