

Year 4: States of matter

What should I already know?

Science - Asking questions about how the world works and finding the answers.

Identify & name a variety of everyday materials (wood, plastic, glass, metal, water, and rock)
Describe the simple physical properties of a variety of everyday materials
Compare & group together a variety of everyday materials based on simple physical properties.

N/C - 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.

Significant information

Solids

Keeps its shape. (Salt, sand and sugar are tiny solids so they pour like a liquid but they pile up and are not wet.)

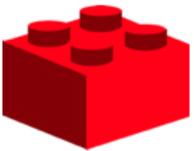
Liquids

Takes the shape of its container. They can change shape but do not change the amount of space they take up. They can flow or be poured.

Gases

Fills its container. Gases escape from an unsealed container and fill the entire volume of space.

Solid



KEEPS its shape

Liquid

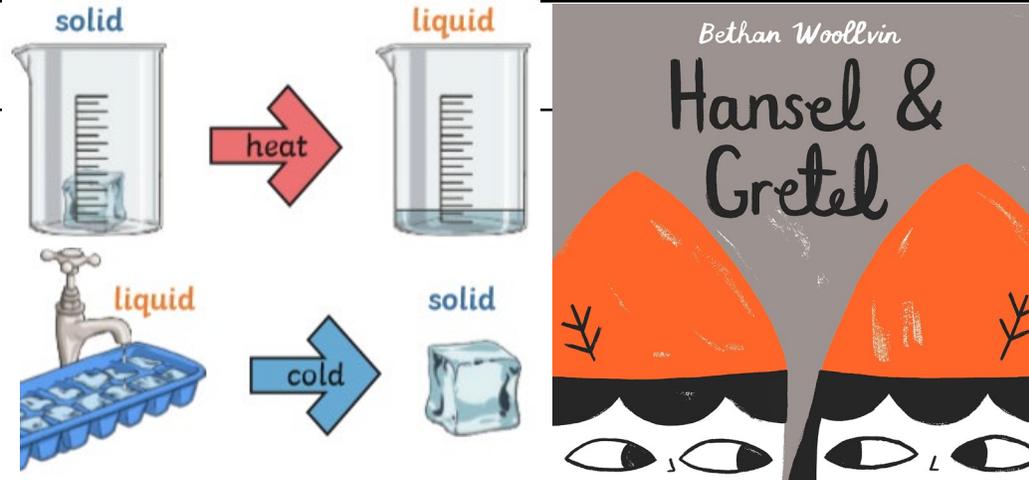


TAKES the shape of its container

Gas



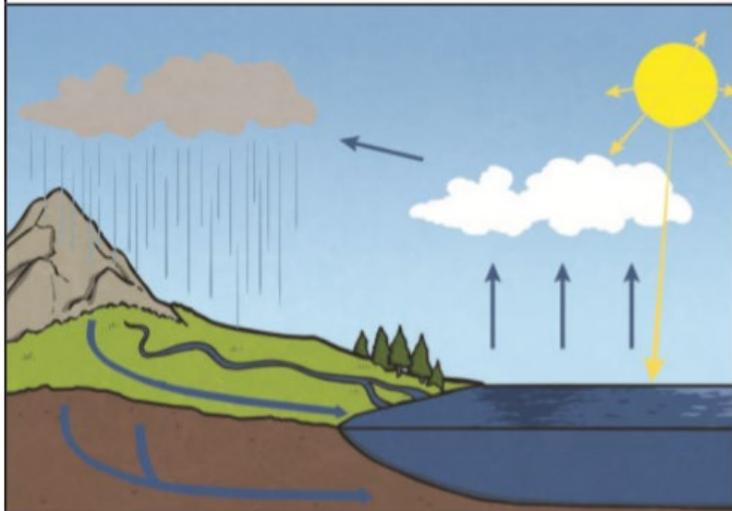
FILLS its container



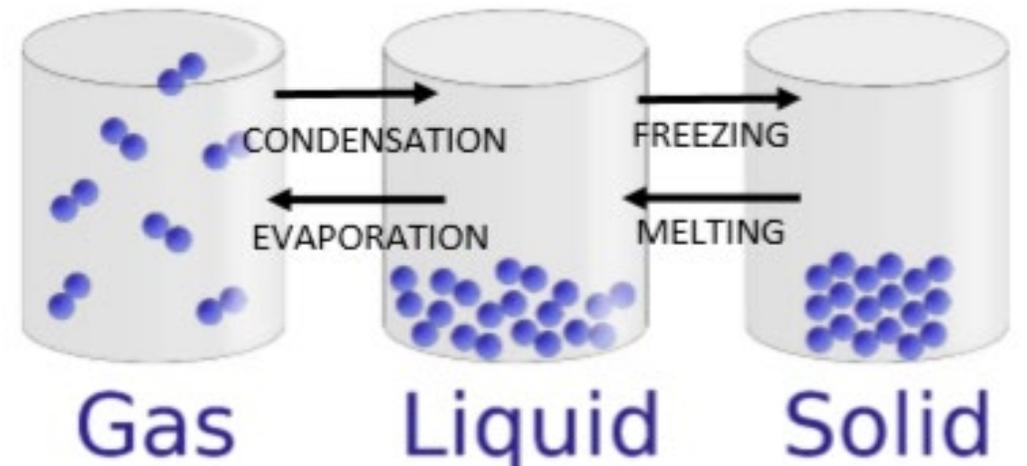
Interesting fact - When water and other liquids reach a certain temperature, they change state into a solid or a gas.

Glossary/Key Learning

Particles	Tiny bits of matter that make up everything in the universe.
Heating	If ice (solid) is heated, it changes to water (liquid). This change is called melting.
Cooling	Materials that do not allow electricity to pass through.
Precipitation	Liquid or solid particles that fall from a cloud as rain, sleet, hail or snow.
Water vapour	This is water that take the form of a gas. When water is boiled it evaporates into water vapour.
How does evaporation occur?	Water (liquid) can change to water vapour (gas). This is called evaporation. If water (liquid) is heated until it boils, it changes to water vapour (gas) very quickly.
What is condensation?	If water vapour (gas) is cooled, it changes to water (liquid). This change is called condensing.



1. Water from lakes, puddles, rivers and seas is **evaporated** by the sun's heat, turning it into **water vapour**.
2. This **water vapour** rises, then cools down to form water droplets in clouds (**condensation**).
3. When the droplets get too heavy, they fall back to the earth as rain, sleet, hail or snow (**precipitation**).



Science Year 4 - States of Matter

<p>National Curriculum Objectives:</p> <ul style="list-style-type: none"> 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. 			<p>Prior Objectives:</p> <ul style="list-style-type: none"> Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. Distinguish between an object and the material from which it is made Identify & name a variety of everyday materials (wood, plastic, glass, metal, water, and rock) Describe the simple physical properties of a variety of everyday materials Compare & group together a variety of everyday materials based on simple physical properties. 		
 <p>Lesson 1 Skill - Group Knowledge - State of matter</p>	 <p>Lesson 2 Skill - Investigate Knowledge -</p>	 <p>Lesson 3 Skill - Observe Knowledge -</p>	 <p>Lesson 4 Skill - Explain Knowledge -</p>	 <p>Lesson 5 Skill - Explore Knowledge -</p>	 <p>Lesson 6 Skill - Describe Knowledge -</p>
<p><u>WALT: Group materials together.</u></p> <p>WILF: -Sort materials -Describe properties -Generate questions</p> <p>What are solids? What are liquids?</p> <p>Have a variety of solids and liquids available. Ask the chn to sort them in any groups they would like. Discuss why they grouped this way. Chn explain the properties of solids and liquids. Chn then go on to explain the properties of jelly, shaving foam and sand.</p> <p>Recording: Pictures. Chn write a sentence to explain the picture.</p>	<p><u>WALT: Investigate gases.</u></p> <p>WILF: -Experiment safely -Experiment fairly -Make observations</p> <p>Video of everyday gases. Rotate between different activities. 1. Chn attempt to squash an empty plastic bottle with a lid, repeat without the lid. 2. Blow a balloon. (weigh before and after) 3. Learn how smell travels using aromatherapy oil. Hunt for the smell. Use drama to model the three states (particles) In a bowl of water, chn submerge a sponge and squeeze it. Can they explain what is happening? Where are the bubbles coming from? (From the spaces and gaps within the sponge.)</p> <p>Recording: Draw the particles of the different states.</p>	<p><u>WALT: Observe changes of state.</u></p> <p>WILF: -Experiment safely -Experiment fairly -Make observations</p> <p>How can we make chocolate change state?</p> <p>Allow the chn to come up with their own ideas of how they can carry out this investigation.</p> <p>Recording: Chn record how long chocolate take to melt in water of different temperatures (Aluminium trays)</p>	<p><u>WALT: Explore changes of state.</u></p> <p>WILF: -Experiment safely -Experiment fairly -Make observations</p> <p>Chn make cornflake buns.</p> <p>Recording: They use their knowledge from the previous lesson to write up the method. Explaining the process of melting and freezing. (a cooking to show as an alternative to writing the method)</p>	<p><u>WALT: Explore how water changes state.</u></p> <p>WILF: -Experiment safely -Experiment fairly -Make observations</p> <p>Show chn a picture of a puddle and ask what they think happens to it over time.</p> <p>Exp1. Ice cubes on some cling film stretched over a container of warm water. Exp2. Boil a kettle. Watch the water vapour form as it boils. Exp3. Ice cubes in two beakers. Teaspoon of salt on one ice cube, and observe what happens. Use a thermometer to observe temperature.</p> <p>Recording: Draw diagram to show all 3.</p>	<p><u>WALT: Identify the stages of the water cycle.</u></p> <p>WILF: -Describe the stages of the water cycle. -Describe evaporation. -Describe condensation.</p> <p>Chn use their knowledge from previous lesson to order pictures showing the process of melting ice, evaporation, water vapour, condensation, water, freezing.</p> <p>Use this knowledge to explain the water cycle.</p> <p>Recording: Create a water wheel to show the process.</p>
<p>Assessment: Use the vocabulary mat to assess the children's prior knowledge and use the mats again to assess what the children have learnt.</p> <p>Key Vocabulary: Solid, liquid, gas, particles, state, properties, matter, melt, freeze, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, thermometer</p>					



solid



liquid



gas



particles



state



properties

matter



melt



freeze



ice



temperature



process



condensation



evaporation



water vapour



energy



precipitation



thermometer