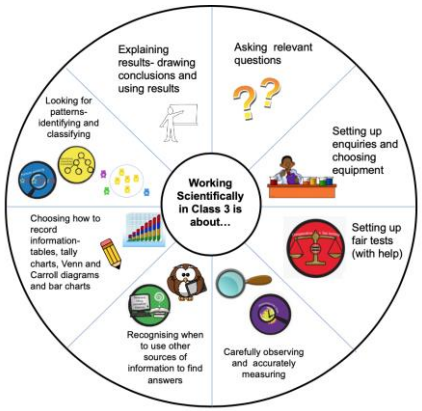
Aldbury Primary & Nursery Knowledge Organisers		
Science Unit: Solids, liquids and gases	**Class 3**	**Year A Spring Term**

What should they already know?

From their 'Materials' unit in Class 2, children should be able to:

- describe the simple properties of a variety of everyday materials
- find out how the shapes of solid objects can be changed by squashing, bending, twisting and stretching
- identify materials that can and cannot be changed with a force

Key vocabulary from Class 2:
hard, stiff, rigid, strong



Working Scientifically tasks that link to this unit:

Year 4 – solids, liquids and gases	**Lemonade bubbles** **do I observe closely what happens during an investigation?**

Key vocabulary

solid	These are materials that keep their shape unless a force is applied to them. They can be hard, soft or even squashy. Solids take up the same amount of space no matter what has happened to them.
liquid	Liquids take the shape of their containers. They can change shape but do not change the amount of space they take up. They can flow or be poured.
gas	Gases can spread out to completely fill the container or room they are in. They do not have any fixed shape.
freeze	This is when a liquid turns into a solid through cooling.
melt	This is when a solid changes to a liquid through heating.
boil	This is when a liquid reaches a temperature at which is bubbles and turns to vapour.
evaporation	This is when a liquid turns into a gas through heating.
condensation	This is when a gas turns into a liquid.
precipitation	Liquid or solid water that fall from a cloud as rain, sleet, hail or snow.
properties	A characteristic or trait that you can use to describe something.
melting point	A temperature at which a solid will melt. Different solids have different melting points.

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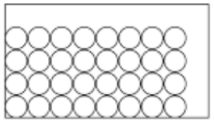
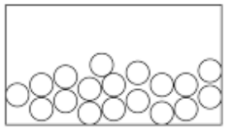
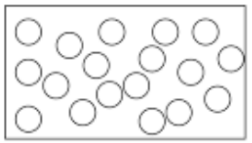
HFL ARE statements explained					
How do I sort objects based on whether they are solids, liquids or gases?	Children should be able to name some solids liquids and gases. They should be able to state some differences between them.	**solids** • cannot be poured • keep their shape unless a force is applied to them • particles are close together and cannot move • they can only vibrate 	**liquids** • can be poured or flow • take the shape of any container they are put in • particles are close together but can move around each other easily **GD statement:** granular solids have properties associated to liquids as they can be poured and take the shape of the containers that they are in 	**gases** • spread out to fill the container or room they are in • no fixed shape • flow from place to place • can be easily compressed • particles in a gas are spread out and can move very quickly in all directions 	
How do some materials change state?	**melting** If a solid is heated to its melting point, it melts and changes to a liquid. examples: ice cream, chocolate, ice cube	**freezing** If a liquid gets cold, it will turn to a solid. examples: ice cream, chocolate, water	**evaporation** example: puddles in the school playground, kettle boiling	**condensation** example: windows after having a shower/bath (the water vapour in the air cools when it touches the cold surface)	
Do all materials melt at the same temperature? (examples)	When water and other liquids reach a certain temperature, they change state into a solid or a gas. The temperatures that these changes happen are called the boiling, melting or freezing point. • Glass: 1400°c • Chocolate: 35°c • Ice: 0°c • Candle wax: 60°c				

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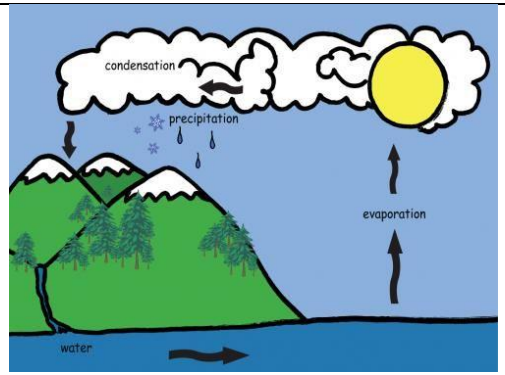
How does evaporation and condensation play a part in the water cycle?	1. Water evaporates into the air. The sun heats up water on land, in rivers, lakes and seas and turns it into water vapour. The water vapour rises into the air. 2. Water vapour condenses into clouds when the air cools down. It changes back into tiny drops of liquid water, forming clouds. 3. Water falls as precipitation (rain). The clouds get heavy and water falls back to the ground in the form of rain, sleet, hail or snow. 4. Water returns to the sea. Rainwater runs over the land and collects in lakes or rivers, which take it back to the sea. The cycle starts all over again. 
Why is salt put on the roads in Winter? (GD statement)	Rock salt is used to grit the roads in the really cold days/nights in Winter. For water to freeze into a solid, the particles need to be touching (see above). When rock salt is added, the salt gets in the way of these particles meeting again and stop the water from freezing and becoming ice. It stops the ice from forming and also melts it, making the roads safer for cars.

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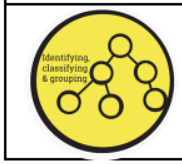
Types of enquiry you could cover in this topic about solids, liquids and gases	
	• Does seawater evaporate quicker than fresh water? • How does the mass of a block of ice/temperature of the room affect how long it takes to melt? • How does the surface area of a container of water affect how long it takes to evaporate? • Where is the best place to dry washing?
	• What happens when water keeps dripping on a sandcastle? • How does the level of water in a glass change when left on the windowsill? • How does the mass of an ice cube change over time? • Which materials is best for keeping our hot chocolate warm? • What happens to a puddle on a hot day?
	• Is there a pattern in how long it takes different sized ice lollies to melt?
	• What is the boiling point of different liquids? • What is the melting point of different materials? • When the first fizzy drink machine was invented in 1775, scientist Joseph Priestly said it was the cure to many health problems. What ideas do scientists have about fizzy drinks today?
	• Can you group these materials and objects into solids, liquids and gases?

Book/writing links
BOOKS • Dr Seuss Bartholomew and the Oobleck • How to Train your Dragon (making armour) • Itch • Charlie and the Chocolate Factory
RECOUNT • Investigate gloop at its unusual properties then write own recount of Oobleck falling from the sky, what would people think it was? • Role play the water cycle then write the journey of water around the water cycle from the point of view of the water molecule.
NON-CHRONOLOGICAL • The water cycle report
INSTRUCTIONS • Make models of the water cycles and then write instructions for other children to be able to do this.
EXPLANATIONS • The water cycle report