KS3 Chemistry – Solids, Liquids and Gases

Subject curriculum intent:	To develop in our students: • An enjoyment of Science by providing relevant, interesting and challenging experiences and activities. • Observational skills, by looking for patterns and contrasts. • An inquiring mind and a logical approach to problem solving. • The ability to draw conclusions from simple experiments and, where appropriate, to devise suitable experiments for further investigations. • Communication skills in speaking and listening, written, diagrammatic and symbolic forms. • Co-operation and a respect for others by being able to work as part of a team – the development of appropriate social skills. • Confidence in their own abilities. • A respect for the environment and a careful use of resources. • An interest in the world about them and a greater understanding of it.

End of KS3 intent/outcome	End of KS4 intent/outcome	End of KS5 intent/outcome
Students will build on their knowledge of science through the different areas – biology chemistry and physics. Students will 'work scientifically' to achieve the goals of each topic area they encounter.	Students will continue to develop their scientific knowledge through the different areas – biology, chemistry and physics. Students will 'work scientifically' to achieve the goals of each topic area they encounter. Students will be able to relate their scientific experiences to everyday life and have an understanding that science is all around them.	N/A

Intent for this topic:	Students will be able to identify and sort materials into solids, liquids and gases. Students will learn the properties of solids, liquids and gases and will have the opportunity to explore how water can change state and observe the changes. Students will learn how the particles in solids, liquids and gases are different. Students will learn about The Water Cycle and how the process links to the states of matter – solids, liquids and gases. Students will 'work scientifically' to achieve these goals, learning the key features of scientific enquiry; observing over time, pattern seeking, identifying, classifying, investigating (fair tests) and researching.
Core vocabulary needed for this subject/topic:	**Subject:** Biology, Chemistry, Physics Observe, pattern, identifying, classifying, investigating, fair test, researching **Topic:** States of matter, solids, liquids, gas, particles

Vocabulary pupils will have accessed in other topics or subject areas:	Materials, properties
Key vocabulary taught within this topic:	States of matter, solids, liquids, gas, particles Heating, cooling, freezing Evaporate, condensate, precipitation, water vapour

Prior knowledge: what pupils may already have studied

Key stage	Subject	Topic title	Term/year taught	Content/What might pupils already know?
KS3	Science	Properties of materials	Spring 1/Year 1	Children may be able to identify different materials. They may have described the properties of different materials as solids or liquids.
KS3	Cook-it	All	All years on a carousel	Children will have some understanding of how heating or cooling food can change the food's state. Children may have heard key words such as liquid, heating, cooling.
KS3	Geography	The Water Cycle	Spring 2/Year 3	Children will have encountered the Water Cycle and may already be able to explain the process. They may also have been introduced to/know key terminology such as evaporation, condensation, precipitation and water vapour.
KS3	Maths	Measurement: Capacity	Summer 1/All	Children may have experienced pouring liquids from one container to another.

Links to other subjects: Life Skills, Cook-it, Geography, Maths

	OU P 5-6	OU P 7-8	OU Step 1	OU Step 2	OU Step 3
Subject specific knowledge	Knows that materials can be sorted into different groups. Knows that solids, liquids and gases are different.	Knows that all materials can be sorted into solids, liquids and gases. Knows that solids, liquids and gases have properties.	Knows that all materials can be sorted into solids, liquids and gases. Knows that solids, liquids and gases have different properties.	Knows the names of solids, liquids and gases. Knows that solids, liquids and gases have different properties. Knows that solids, liquids and gases have	Knows the names of different solids, liquids and gases. Knows that solids, liquids and gases have different properties. Knows that solids, liquids and gases have

	Knows that heating and cooling/freezing can change the state of water.	Knows that solids, liquids and gases move differently. Knows that water can change state through heating/cooling/freezing.	Knows that solids, liquids and gases move differently. Knows that water can change state through heating/cooling/freezing. Knows that The Water Cycle shows the process of water changing state.	a different arrangement of particles. Knows that water can change state through heating/cooling/freezing. Knows that The Water Cycle shows the process of water changing state.	a different arrangement of particles. Knows that water can change state through heating/cooling/freezing. Knows the process of The Water Cycle.
Subject specific skills	Is able to sort solids, liquids and gases. Is able to turn ice to liquid (water). Is able to turn water into ice. Is able to identify when a change happens. Follow a set of demonstrations to carry out a simple investigation.	Is able to sort solids liquids and gases. Is able to give one example of a solid, liquid and gas. Is able to identify a property of a solid, a liquid and a gas. Is able to change the state of water to a solid (ice) and a gas (water vapour) and back. Is able to observe changes of state.	Is able to sort solids, liquids and gases. Is able to name several solids, liquids and gases. Is able to label different properties as a solid, liquid or a gas. Is able to change the state of water to a solid (ice) and a gas (water vapour) and back. Is able to observe changes of state.	Is able to name solids, liquids and gases. Is able to identify different properties of solids, liquids and gases. Is able to label a particle diagram as solids, liquids and gases. Is able to observe changes of state. Is able to explain how water changes state.	Is able to explain the differences between solids, liquids and gases by their properties. Is able to draw and label a diagram of the arrangement of particles in a solid, liquid and gas. Is able to explain how the particles are different in solids, liquids and gases. Is able to explain how water changes state. Is able to observe changes of state.

		Follows a picture method to carry out a simple investigation.	Is able to explain the process of changing the state of water. Is able to label the stages of The Water Cycle. Follows a word and picture method to carry out a simple investigation.	Is able to match the process of The Water Cycle to each stage. Follows a written set of instructions to carry out a simple investigation. Records results in a suitable table.	Is able to draw conclusions from observations. Is able to explain the process of the water cycle using scientific vocabulary (evaporation, condensation, precipitation). Follows a written set of instructions to carry out a simple investigation. Records results in a suitable table and is able to draw conclusions from their results.
Suggested Activities	• Sorting and naming solids, liquids and gases. • Explore & compare the properties of solids, liquids and gases. • Children to act out different particle movements of solids, liquids and gases. • Draw and label particle diagrams of solids, liquids and gases. • Explore how heating and cooling/freezing can change the state of water (see possible investigations) • Label the Water Cycle. • Create Water Cycle wheels. • Explain the process of the water cycle.				
Possible Investigations	• Show the changes of state of water through heating and cooling– ice, water, gas • The Water Cycle in a jar. • Does the colour of an ice-cube make a difference to how fast it melts?				

	• Can you stop an ice-cube melting? • Does the shape of the container affect evaporation?
Personal development	**Problem solving** Investigations and matching exercises **Communication skills** Working as pairs in investigations, asking and answering qustions **Self-belief** Learning new skills, practising them and demonstrating them. **Self-management** Working with new equipment **Teamwork** Working as groups to solve problems or find out new information
Online resources Twinkl CLEAPPS for risk assessments BBC bitesize for video resources. YouTube – videos and songs linked to topic.	
Evidencing Work **All work / evidence sheets need to be printed off (where appropriate levelled in accordance with the rubric), students need to self-assess and work needs to be put in student folders.**	

RRS Articles:
This unit of work is linked to Articles of the UN Convention on the Rights of the Child.