

	PARK LANE PRIMARY SCHOOL	YEAR 4 STATES OF MATTER			SCIENCE
PRIOR KNOWLEDGE		COMMON MISCONCEPTIONS			
Builds on previous learning in Y2: - 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		All substances can only exist in one state of matter: Children may think that substances can only exist in one particular state of matter, such as solid, liquid or gas. They may not grasp that substances can change their state depending on factors like temperature and pressure. All substances change state at the same temperature: Children might believe that all substances change state at the same temperature. In this unit, they will begin to understand that different substances have different melting points, boiling points and transition temperatures, leading to variations in their state changes. Water disappears during evaporation: Children might assume that water completely disappears during the process of evaporation. They will learn that water molecules simply change from a liquid state to a gaseous state, forming water vapour in the air. In this unit, children will learn that this process is also an important part of the water cycle.			
Lesson Intention	National Curriculum Reference	Scientific Enquiry	Rocket Words	Resources	
Compare and group the 3 states of matter	Compare and group materials together, according to whether they are solids, liquids or gases	Pattern Seeking Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	➤ Joseph Priestley (discovered oxygen) matter solid liquid gas volume	Examples of the 3 states of matter, scissors, glue and pencils	
Explore how particles behave in solids, liquids and 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)	Researching Using Secondary Sources Use straightforward scientific evidence to answer questions or to support their findings, with increasing independence	particle bond arranged cooled heated	Ruler, pencil, water, an ice tray, a freezer, a kettle/stove and a thermometer/temperature probe	
Investigate melting points	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)	Observing Over Time Make systematic and careful observations, taking accurate measurements with a range of equipment including thermometers and data loggers, with increasing independence	➤ Lord Kelvin (temperature scale) ➤ Anders Celsius (temperature scale) ➤ Daniel Fahrenheit (temperature/thermometer inventor)	Mini whiteboards, variety of foods to melt (such as butter, coconut oil, dark, milk and white chocolate, gummy bear, different cheeses), tealight stand, tealight, metal pie cases, tongs, matches, or access to a kitchen stove with	

			particle melting melting point temperature thermometer	a saucepan and bowl over boiling water, thermometer
Explore freezing and boiling points	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)	Answering Questions through Collecting, Analysing & Presenting Data (Problem-Solving) Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	freezing reverse boiling sublimation deposition	Computers/tablets, squared paper, coloured pencils, ruler, pencil
Explore evaporation and condensation	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	Answering Questions through Collecting, Analysing & Presenting Data (Problem-Solving) Use data to draw simple conclusions and identify new questions, with increasing independence Begin to make predictions for new enquiries and think about ways to improve their enquiries, with support	evaporation condensation absorb water vapour process	Cups or beakers, water, measuring cylinders, graph paper, ruler, pencil
Understand the water cycle	Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	Answering Questions through Collecting, Analysing & Presenting Data (Problem-Solving) Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	water cycle precipitation surface runoff transpiration groundwater	Coloured pencils, pencil, glue and scissors