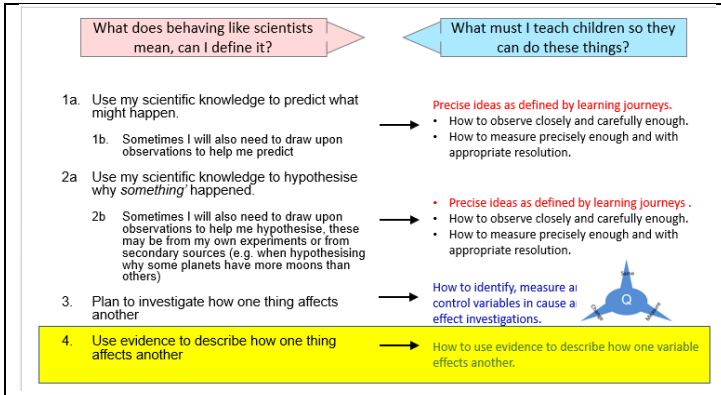
Learning journey	Science	Properties and changes of materials (Solids, liquids & gases)	Year 4 Summer 2	

Building on prior learning	Theme overview	Preparing for future learning	Vocabulary	
In key stage 1 children will have learnt about materials, their properties and why we choose materials to do jobs. In Year 3 children learnt about separating mixtures. They learnt about the properties of solids, liquids and gases to understand how to separate	• Materials can be divided into solids liquids and gases. • Materials can change state by heating and cooling. • Different substance change state at different temperatures. • Investigate what happens at the melting temperature of solids	Explain what the children will study in the next unit of work and where this will lead in the next year In the Autumn of Y5 the children will learn about making new substances. They will focus on learning that heating or mixing materials can result in making completely new ones.	State, solid, liquid and gas • Temperature, hotter, colder, heating, cooling.	State change: melting, freezing, evaporating and condensing. • Insulator and conductor

NC coverage and HWJS skills development	Knowledge organisers	
National curriculum coverage • 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) **HWJS skills development**	**Chapter 1: Properties of solids, liquids and gases.** Materials can be divided into solids liquids and gases. •Solids hold their shape unless forced to change .Liquids flow easily but stay in their container because of gravity. The more viscous a liquid the less runny it is. Gases move everywhere and are not held in containers by gravity. **Chapter 2: Changing state.** •Heating causes solids to melt into liquids and liquids to evaporate to gases. •Cooling causes gases to condense to liquids and liquids to freeze to solids. **Chapter 3: Melting, freezing, boiling and condensation temperatures.** Different substance change state at different temperatures but the temperatures at which given substances change state are always the same. **Chapter 4 What happens at the melting temperature?**	Children are shown the following equipment and asked to predict what will happen and why, and then they do it. 



A Model of Progression.

1. Pose problems that require the application of knowledge being taught.
2. Deconstruct the problem to define what a child must understand and be able to do to tackle the problem (including what they need to observe and measure), teach these skills and knowledge ***at that point.***
3. As children progress through the curriculum they will tackle problems using new ideas, and when the problem requires with closer observation and more precise measurement.

Good enough progression is being able to tackle these problems

Children gather evidence to describe the relationship between variables (cause and effect) by identifying what must be changed, what measured and what must be kept the same.

In this instance: Precise amounts of salt added to different liquids (the independent variable) to observe their effect on the freezing time of water, make accurate descriptions using scientific and mathematical language to observe over time. Hypothesise about the effect of salt on water and then draw conclusions based on observations of the state of the water over a chosen time. Some will be more solid than others. The salt will cause the water not to freeze at 0c.

•The temperature at which a substance melts from a solid to a liquid is the same at which it freezes from a liquid to a solid.
•The temperature at which a substance boils from a liquid to a gas is the same at which it condenses from a gas to a liquid.
•Liquids evaporate slowly, even below their boiling temperatures.

Connections / deepening understanding How is the understanding of this area deepened in other areas of the curriculum? What links are there in the other subjects in the curriculum?	**RADE** Are the rights of the child relevant in this area of study - do they get referred to in the work?	**Assessment** By the end of the unit the children will be able to … Details of the objectives that they will have covered within this unit of work
English – Note making and report writing Geography – weather cycle		1. Materials can be solid, liquid or gas 2. Heating causes solids to melt and liquids to evaporate 3. Different substances change state at different temperatures. 4. Describe how salt affects the freezing point of water 5. Gather evidence to describe the relationship between variables (cause and effect) by identifying what must be changed, what measured and what must be kept the same.

Assessment recording for the unit - checking the level of pitch of the work			
Key skill(s)/ knowledge to be assessed by the end of the unit	**Lower attaining**	**Middle attaining**	**Higher attaining**
Details of key skill(s) that this unit will cover 1. Children can separate a mixture of solids 2. Materials can be solid, liquid or gas 3. Heating causes solids to melt and liquids to evaporate 4. Different substances change state at different temperatures. 5. Describe how salt affects the freezing point of water	Pupils can describe a material as solid , liquid or gas. Pupils can name different solids, liquids and gases. Pupils can describe how a freezer will turn water into a solid called ice.	Pupils can describe a material as solid , liquid or gas. They know that solids hold their shape, liquids stay in the shape of their container and run and that gases move everywhere and aren't held by gravity. Pupils can name different solids, liquids and gases. They know that heating turns solid to liquid and liquid to gas and that cooling will have the inverse affect. Pupils can describe how a freezer will turn water into a solid called ice. They begin to recognise that adding salt will lower the temperature at which the water will freeze.	Pupils can describe a material as solid , liquid or gas. They know that solids hold their shape, liquids stay in the shape of their container and run and that gases move everywhere and aren't held by gravity. They recognise that there are some solids that behave like a liquid such as salt. Pupils can name different solids, liquids and gases. They know that heating turns solid to liquid and liquid to gas and that cooling will have the inverse affect. They can describe and explain specific examples such as ice-water-steam. Pupils can describe how a freezer will turn water into a solid called ice. They begin to recognise that adding salt will lower the temperature at which the water will freeze. They can explain that the more salt that is

			added will lower the freezing point further to some extent. Pupils begin to understand that Freezing and melting temperatures are identical. Boiling and condensing temperatures are identical. Pupils can see that Liquids evaporate slowly, even below their boiling temperatures.

NB: The assessments are completed for two reasons – to enable the class teacher and in turn the subject leader to evaluate the pitch of the learning within the unit in order to consider any necessary updates and for the class teacher to report to parents on the attainment of pupils in the end of year reports.