States of Matter : Science : Year 4

	Learning Objective	Overview	Assessment Questions	Resources
Lesson 1	To compare and group materials together according to whether they are solids or liquids.	Challenge your class to define what solids and a liquids are and sort materials into groups based on their state. Children will discuss the different items that may not seem to fit and look closely at how they're made up including pourable solids such as rice or sand. Alternatively, explore and make observations of non-newtonian fluids as you make slime together.	• Can children provide a definition of solid or liquid? • Are children able to sort objects into solids and liquids? • Can children explain why they have placed an object into either group?	• Slides • Object Cards 1A • Sorting Cards 1A/1B/1C • Worksheet 1A/1B • Slime Recipe Cards 1A (FSD? activity only) • Ingredients for slime (FSD? activity only) • Challenge Cards 1A (FSD? activity only) • Worksheet 1C (FSD? activity only)
Lesson 2	To identify and explore the properties of gases.	Take a look at the third state that a material can be in and explore if gases have mass. Look at the different ways that gases are used in everyday life and how their different properties make them useful for different purposes.	• Can children name some of the properties of gases? • Are children able to write a scientific definition of a gas? • Can children use their scientific knowledge to draw conclusions about their experiment's results?	• Slides • Electronic scales • Bottles with lids • Sponges • Containers of water • Experiment Card 2A • Worksheet 2A/2B/2C • Fizzy drink • Syringes of different sizes (FSD? activity only) • Plastic tubes* (FSD? activity only) • Balloons (FSD? activity only) • Pneumatics Card 2A (FSD? activity only) • Worksheet 2D (FSD? activity only)
Lesson 3	To observe that materials change state when they are heated or cooled.	In this lesson the children will take a closer look at the particles in solids, liquids and gases and how they behave in these states. They will then use this knowledge to describe what happens when solids and liquids freeze and melt.	• Can children describe the difference between the particles in solids, liquids and gases? • Can children describe what melting is? • Can children describe what freezing is?	• Slides • Worksheet 3A/3B/3C • Recipe Cards 3A (FSD? activity only) • Ingredients (FSD? activity only) • Cooking equipment (FSD? activity only) • Party Cards 3A (FSD? activity only)
Lesson 4	To research the temperature in degrees Celsius (°C) at which materials change state.	This lesson challenges your class to research the melting points of different materials. They can use the internet to find the melting points of materials such as gallium, olive oil and gold. Alternatively, have your class design and reflect on an investigation about the melting points of different chocolate.	• Do children understand that different materials have different freezing/melting points? • Can children use their research skills to find the melting points of less common materials? • Can children evaluate an experiment's fairness and suggest improvements?	• Slides • Sorting Cards 4A • Worksheet 4A/4B/4C • Experiment Card 4A (FSD? activity only) • Worksheet 4D (FSD? activity only) • Milk, white and dark (80% cocoa) chocolate (FSD? activity only) • Warm water (FSD? activity only) • Timers (FSD? activity only) • Foil trays (FSD? activity only)
Lesson 5	To understand the process of evaporation.	In this lesson the children will be asked to focus on the process of a liquid turning into a gas. They will think about the everyday examples of evaporation including puddles 'disappearing' throughout the day as well as the cooling effects of sweat on our skin. They will discuss the differences between evaporating and boiling as well as highlighting the boiling point of water. They are challenged to conduct an investigation into the rates of evaporation and how heat and air can affect them.	• Can children describe the process of evaporation? • Can children give an everyday example of water evaporating? • Can children describe a way to increase the rate of evaporation?	• Slides • Hand sanitiser • Teacher Notes 5A • Worksheet 5A/5B • Experiment equipment • Challenge Card 5A (FSD? activity only) • Ideas Sheet 5A (FSD? activity only) • Investigation Planner 5A (FSD? activity only) • Investigation equipment (FSD? activity only) • Design Sheet 5A (FSD? activity only)

Lesson 6	To understand the process of condensation.	In this lesson the children will look at the opposite process to evaporation: condensation. They will think about what causes water to condense and look at some examples of this. They are then challenged to recreate a situation where they can see water condensing, including its use in a solar still to remove the salt from sea water.	• Can children name each of the ways a material can change state? • Are children able to describe condensation and when it happens? • Can children create a diagram to help them explain condensation?	• Slides • Teacher Notes 6A • Cling film or other flexible plastic • Ice cubes • Worksheet 6A/6B/6C • Challenge Card 6A (FSD? activity only) • Worksheet 6D (FSD? activity only) • Salt water (FSD? activity only) • Bowls and beakers (FSD? activity only) • Small weights (FSD? activity only)
Lesson 7	To identify the part played by evaporation and condensation in the water cycle.	This final lesson draws upon the children's learning of evaporation and condensation to describe the water cycle. They will look at four simplified steps of the water cycle and how these processes play a part.	• Do children know what the water cycle is? • Can children name the different stages of the water cycle? • Do children know that evaporation and condensation are processes that can be reversed?	• Slides • Teacher Notes 7A • Worksheet 7A/7B • Word Bank 7A • Water Cycle Diagram 7A (FSD? activity only) • Challenge Card 7A (FSD? activity only) • Sealable sandwich bags or plastic wallets (FSD? activity only)

NB: 'FSD? activity only' refers to the alternative 'Fancy Something Different…?' activity within the lesson plan