

Progression in Substantive Knowledge

Chemistry Materials

Substantive Knowledge year R	Substantive Knowledge year 1	Substantive Knowledge year 2	Substantive Knowledge year 3
<u>Materials</u> • Builder's yard. • Material hunt. • Collages of different textures. • Material detectives. • Making boats. • Making vehicles. • Mud kitchen. • Melting chocolate – cornflake cakes. • Ice - keeping ice eggs safe. • Snow (whenever available!) • Cornflour and water mix. • Clay. • Recycling – how can you sort the rubbish? • Den making. • Playing with magnets. • Floating and sinking. • Making costumes – waterproof, warm, flexible, strong, light, hats for different weathers. • Making houses for the three pigs. • Magnets. • Looking at different materials with magnifying glasses.	<u>Describing Materials</u> Knowledge Block 1- The big idea about materials • There are many different materials that have different observable properties • Materials that have similar properties are grouped into metals, rocks, fabrics, wood, plastic and ceramics (including glass).	<u>Changing Materials</u> Knowledge Block 1- How materials can change • The properties of a material determine whether they are suitable for a purpose. • Materials can be changed by physical force (twisting, bending, squashing and stretching). (The purpose of the activities within this learning journey is for children to understand why we choose certain materials to do certain jobs. Children will plan how to test materials (wood, metal, plastic, glass, brick, paper, rock, cardboard))	<u>Solids, liquids and gases</u> Knowledge Block 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. Knowledge Block 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. Knowledge Block 3- Melting, freezing, boiling and condensation temperatures • Different substances change state at different temperatures but the temperatures at which given substances changes state is always the same. Knowledge Block 4- All about the water cycle • 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. • The water cycle is the process by which water is continuously transferred between the surface of the earth and the atmosphere. Liquid water evaporates into water vapor, condenses to form clouds, and precipitates back to earth in the form of rain and snow.

Progression in vocabulary

Chemistry Materials

Year R Vocabulary	Year 1 Vocabulary	Year 2 Vocabulary	Year 3 Vocabulary
<u>Materials</u> Similar, same, different, soft, squashy, shiny, waterproof, sturdy, rough, smooth, metal, plastic, wood, fabric, mud, soil, paper, absorbent, water resistant, repellent, soft, hard, bumpy, round, curved, flat, light, dark, heavy, moist, dry, wet, humid, hot.	<u>Describing Materials</u> Properties How a material can be described. Metal A solid material that is hard and shiny. Rock A natural solid material made from minerals which make up the surface of the earth. Fabric Cloth or material that is woven or knitted. Wood Wood comes from the trunks and branches of trees. Plastic Plastic is a man-made material that can change its shape. Ceramic Ceramics are often made from clay. Suitable Right for the purpose. Purpose The reason why something is made or done.	<u>Changing Materials</u> changed Different from before physical When objects touch force making them move in some way absorb To soak up or take in liquid. crumbly Easily broken onto a lot of little pieces. property How a material can be described. drag Pull something along with difficulty. suitable Right for the purpose. strongest Objects or materials that are not easily broken. flexible Bends easily without breaking	<u>Solid, Liquid and Gases</u> slate A distinct form in which matter can exist. solid A substance or object stays the same shape whether it is in a container or not. liquid A substance that flows freely gas A substance that will expand to fill a container, with no fixed shape or volume. gravity A force that attracts the body to the centre of the earth or other objects with mass. viscous Having a thick sticky consistency between a solid and a liquid. heating To raise the temperature. cooling To lower the temperature. melting When an object changes from a solid to a liquid. boiling When an object changes from a liquid to a gas. evaporate The process of turning liquid into a gas. freeze When a liquid becomes a solid. condense When a gas becomes a liquid

