

Chemistry Progression Document – updated May 2024

National Curriculum statements in red are from other linked topics.

MATERIALS				
Year	Topic	NC objectives covered by the topic	Substantive knowledge	Vocabulary
EYFS	Traditional Tales	<p>ELG: The Natural World</p> <ul style="list-style-type: none"> Understand some important processes and changes in the natural world, including changing states of matter. 	<ul style="list-style-type: none"> <i>Investigating materials – sorting materials into groups (hard/soft, hot/cold).</i> <i>Exploring properties of materials - which materials work best for house building?</i> <i>Exploring properties of materials – designing and building a house and testing its strength and whether it is waterproof.</i> 	<p>ice, water, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big, bigger, biggest, smaller, smaller, smallest, hard, soft, bendy, rigid, wood, plastic, paper, card, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change back</p>
	Naming and describing materials (A)	<ul style="list-style-type: none"> Distinguish between an object and the material it's made of. Identify and name a variety of everyday materials including wood, plastic, glass, metal, water and rock. 	<ul style="list-style-type: none"> <i>Everything around us is made from materials.</i> <i>Some materials are natural materials, naturally sourced materials that are used without modification.</i> <i>Some materials are manufactured materials, made by changing natural source materials.</i> <i>Different materials have different characteristics.</i> <i>Materials should be used carefully and can often be reused or recycled.</i> <i>Objects can be sorted according to their source material</i> 	<p>absorb/absorbent manufactured material property recycle reuse transparent</p>
YEAR 1/2	Properties and uses of materials (B)	<ul style="list-style-type: none"> Distinguish between an object and the material it's made of. Describe the simple physical properties of everyday materials Compare and group together a variety of everyday materials on the basis of their simple physical properties 	<ul style="list-style-type: none"> <i>Objects can be made from more than one material, including recycled materials.</i> <i>Materials have physical properties that make them useful for different purposes.</i> 	<p>Bend Flexible Opaque Rigid Waterproof absorb/absorbent manufactured/man-made material natural property recycle reuse transparent</p>

Choosing materials (B)	<ul style="list-style-type: none"> Identify and compare the suitability of a variety of everyday materials (including wood, metal, plastic, glass, brick, rock, paper and cardboard) for particular uses. 	<ul style="list-style-type: none"> <i>Objects can be tested and sorted according to the properties of the materials they are made from.</i> <i>Inventors discover new uses for materials and create new materials</i> 	<i>bouncy/bounciness</i> <i>durable</i> <i>elastic/elasticity</i> <i>absorb/absorbent</i> <i>flexible</i> <i>material</i> <i>opaque</i> <i>property</i> <i>rigid</i> <i>transparent</i> <i>waterproof</i>
Changing materials (A)	<ul style="list-style-type: none"> Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. 	<ul style="list-style-type: none"> <i>Squashing, bending, stretching and twisting can change the shape of some materials.</i> <i>Different properties allow the shapes of materials to be changed in different ways.</i> <i>Objects are made from materials with properties that make them fit for purpose.</i> 	<i>elastic/elasticity</i> <i>squashy/squash</i> <i>stiff</i> <i>stretchy/stretch</i> <i>twist</i> <i>bend</i> <i>flexible</i> <i>material</i> <i>property</i> <i>rigid</i>

YEAR 3/4	Changes of state (B)	<ul style="list-style-type: none"> 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) identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature 	<ul style="list-style-type: none"> <i>A solid holds its shape. Liquids can be poured and will spread out. Both solids and liquids have a fixed volume.</i> <i>Water freezes at zero degrees Celsius.</i> <i>Freezing/solidifying is when a liquid changes state into a solid. Melting is when a solid changes state into a liquid. Different materials melt at different temperatures. Melting and freezing are reversible processes.</i> <i>Air is a gas. Gases have substance (take up space) and have weight. Gases change in shape and volume to fill the space they are in.</i> <i>When water changes state from liquid into gas it becomes water vapour. This process is called evaporation. Liquids other than water evaporate too. Steam is the invisible gas produced by boiling water.</i> <i>When water vapour changes state from gas into liquid it becomes water. This process is called condensation.</i> <i>The Earth's water can be a liquid (water), a gas (vapour) and a solid (ice). Water in the environment evaporates into the air then the warm air cools as it rises, leading to condensation and the formation of clouds. Water droplets in the clouds fall as rain (or as snow or hail if cooled below freezing point). The water returns to the sea via streams, lakes and rivers to continue the water cycle.</i> 	<p>degree Celsius (°C): a scale</p> <p>volume</p> <p>air</p> <p>boil</p> <p>boiling point</p> <p>bubble</p> <p>carbon dioxide</p> <p>change of state</p> <p>cloud</p> <p>compress</p> <p>condense/condensation</p> <p>evaporate/evaporation</p> <p>expand</p> <p>freeze</p> <p>freezing point</p> <p>gas</p> <p>granule/granular</p> <p>heat-sensitive</p> <p>helium</p> <p>ice</p> <p>liquid</p> <p>melt</p> <p>melting point</p> <p>oxygen</p> <p>powder</p> <p>water droplets</p> <p>solid</p> <p>solidify</p> <p>steam</p> <p>viscous</p> <p>water vapour</p>
	Rocks, soils and fossils (A)	<ul style="list-style-type: none"> Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. 		
	Forces, friction and magnets (A)	<ul style="list-style-type: none"> Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. 		

YEAR 5/6	Properties and uses of materials (A)	<ul style="list-style-type: none"> • compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, electrical conductivity and response to magnets • investigate the thermal conductivity of materials • give reasons, based on evidence from comparative and valid tests, for the particular uses of everyday materials, including metals, wood and plastic 	<ul style="list-style-type: none"> • <i>Materials have physical properties that make them fit for certain purposes.</i> • <i>Weathering, wear and tear can occur over time and this will have an impact upon a material's fitness for purpose.</i> • <i>The properties of liquids include having a fixed weight, a fixed volume, an ability to flow, a level of viscosity; and they take on the shape of a container.</i> • <i>The viscosity of a liquid describes how thick or thin it is and how fast or slowly it will flow.</i> • <i>A thermal insulator is a material that does not transmit heat through it well.</i> • <i>A thermal conductor is a material that transmits heat through it very well.</i> • <i>A thermal insulator keeps hot things hot and cold things cold.</i> • <i>Materials can be absorbent and can soak up and take in liquid.</i> • <i>Some materials are permeable and let water pass through.</i> • <i>Some materials are waterproof and do not let water pass through.</i> 	<p><i>Brittle</i> <i>Ductile</i> <i>Fragile</i> <i>Impermeable</i> <i>malleable/malleability:</i> <i>permeable</i> <i>thermal conductor</i> <i>thermal insulator</i> <i>viscosity/viscous</i> <i>absorb/absorbent</i> <i>compost</i> <i>decompose</i> <i>durable</i> <i>elastic/elasticity</i> <i>electrical</i> <i>conductor/insulator</i> <i>flexible/flexibility</i> <i>hard/hardness</i> <i>liquid</i> <i>magnetic/non-magnetic:</i> <i>opaque</i> <i>property</i> <i>solid</i> <i>transparent/transparency:</i> <i>weathering</i></p>
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Separating mixtures and changing materials (A)	<ul style="list-style-type: none"> know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating demonstrate that dissolving, mixing and changes of state are reversible changes explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda. 	<ul style="list-style-type: none"> <i>Solid, dry mixtures of materials can be separated by sieving.</i> <i>Some solids dissolve in water while others do not.</i> <i>Solids that do not dissolve can be separated from a liquid by filtering.</i> <i>Solids which dissolve can be retrieved from a solution if the liquid is evaporated.</i> <i>Some changes of state are reversible, and others are non-reversible.</i> <i>Non-reversible changes result in the formation of new materials.</i> 	contamination Dissolve Filter Insoluble non-reversible/ irreversible react/reaction reversible saturated separate sieve soluble solution condense carbon dioxide crystal/crystalline evaporate/evaporation: gas liquid solid
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ROCKS				
Year	Topic	NC objectives covered by the topic	Substantive knowledge	Vocabulary
EYFS	Colour and pattern	ELG: The Natural World <ul style="list-style-type: none"> Understand some important processes and changes in the natural world. 	<ul style="list-style-type: none"> <i>Exploring rocks</i> 	<i>Shells, pebbles, stones, rock, brick, clay, hard, soft, rough, smooth</i>
YEAR 1/2	Naming and describing materials (A)	<ul style="list-style-type: none"> <i>Distinguish between an object and the material from which it is made</i> <i>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</i> 		
	Properties and uses of materials (B)	<ul style="list-style-type: none"> <i>Describe the simple physical properties of a variety of everyday materials. (Y1 - Everyday materials)</i> <i>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</i> 		
	Choosing materials (B)	<ul style="list-style-type: none"> <i>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</i> 		

<p style="text-align: center;">YEAR 3/4</p>	<p>Rocks, soils and fossils (A)</p>	<ul style="list-style-type: none"> • Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. • Recognise that soils are made from rocks and organic matter. • Describe in simple terms, how fossils are formed when things that have lived are trapped within rock. 	<ul style="list-style-type: none"> • <i>Rocks can be compared and grouped according to their appearance and simple properties.</i> • <i>Rocks change over time depending on their physical properties.</i> • <i>Soils are made from rocks and organic material.</i> • <i>Specific properties of different soils affect whether they absorb and hold water or not.</i> • <i>Fossils are formed when living things are trapped within rock.</i> • <i>Human knowledge of the living world has been developed through the lives and work of fossil scientists such as Mary Anning</i> 	<p><i>crystal/crystalline erosion fossil hardness organic remains rock sediment weathering: absorb/absorbent durable material property soil waterproof</i></p>
<p style="text-align: center;">YEAR 5/6</p>	<p>Evolution and inheritance (B)</p>	<ul style="list-style-type: none"> • Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. 		