



St Felix RC Primary School- Progression Map

Chemistry- Properties and Behaviour of Materials

<p><u>Understanding of the World: Science</u></p> <p><u>Age 3/4</u></p> <p>Talk about the differences between materials and changes they notice.</p> <p>Use all their senses in hands-on exploration of natural materials.</p> <p>Explore collections of materials with similar and/or different properties.</p> <p>Talk about what they see, using a wide vocabulary</p> <p><u>Reception</u></p> <p>Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.</p>	<p><u>KS1 National Curriculum Statement:</u></p> <p><u>Year 1</u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none">-distinguish between an object and the material from which it is made- identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock-describe the simple physical properties of a variety of everyday materials-compare and group together a variety of everyday materials on the basis of their simple physical properties. <p><u>Year 2</u></p> <p>Pupils should be taught to:</p> <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.	<p><u>KS2 National Curriculum Statement:</u></p> <p><u>Year 3</u></p> <p>Pupils should be taught to:</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-describe in simple terms how fossils are formed when things that have lived are trapped within rock- recognise that soils are made from rocks and organic matter. <p><u>Year 4</u></p> <p>Pupils should be taught to:</p> <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. <p><u>Year 5</u></p> <p>Pupils should be taught to:</p> <ul style="list-style-type: none">-compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets-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
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		<p>- give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>- demonstrate that dissolving, mixing and changes of state are reversible changes</p> <p>- 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.</p>
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Coverage	<p>Dinosaurs Rocks can sometimes contain fossils that palaeontologists can study</p> <p>Heroes and adventures Ice investigation- (link to South Pole – Shackleton). Ice changes from a solid to a liquid when it melts.</p>	<p>Transport –past and present Seasons of the Year – Winter Changing state of matter; frost and ice- looking closely at ice, what happens when it warms? Why can we see our breath when it is cold? Stories from the past Seasons of the year- Summer Changing state of matter; Why do our ice lollies melt?</p>	<p>Materials and Magnets Classification of materials, magnets, magnetic attraction.</p>	<p>Materials and Matter Comparing materials, changing materials, concepts of atoms, matter, solids, liquids, gases, measurements.</p>	<p>Rocks Sorting rocks, how rocks are formed, hardness and permeability, fossils, soil.</p>	<p>States of Matter and the Water Cycle Change of state, evaporation, condensation, precipitation, humidity, groundwater.</p>	<p>Materials Properties- solubility, conductivity, flexibility, fair testing, solubility, separation of mixtures, reversible changesdissolving, mixing, change of state.</p> <p>Meteorology Weather and climate, the atmosphere, the Ozone layer, air movement and wind direction, cold and warm fronts, thunder and lightning.</p>	

<p>End Points</p>	<p>Children will explore fossils and will understand that fossils give palaeontologists clues about what life was like a long time ago. This knowledge will be built upon in Science in KS2 when children learn about rocks and fossils. It also helps our youngest children to begin to develop disciplinary understanding of what scientists or palaeontologists do, how they found out what we know about dinosaurs and why that matters.</p> <p>Ernest Shackleton was an explorer who led expeditions to some of Earth's coldest places. The children will use this context to explore properties of water.</p>	<p>Opportunities to explore properties of ice- children will build on knowledge that ice melts in heat from solid to liquid and apply to every day experiences of ice- lollies melting and consider why.</p>	<ul style="list-style-type: none"> • Objects around us are made from types of materials. • Some everyday materials that objects are made from include wood, plastic, glass and metal. • Each material can be used to make many different things, for example plastic can be made into cups, plates, toys, chairs. • Properties of materials are things we can measure, see or feel. • Materials have different properties that make them useful for different tasks. • Some materials will be better suited to certain purposes than others. • Certain materials are attracted to magnets. • We cannot see the force of magnetism. 	<ul style="list-style-type: none"> • Everyday materials include wood, metal, plastic, glass, brick, rock, paper and cardboard. • Every material has its own properties – these can include being hard, soft, opaque, shiny, bendy. • Materials are used for a purpose depending on their properties. • Inventors need to think about the best materials to use for their inventions. • Scientists use a microscope to look closely at very small things. • Sometimes, materials look very different when we look at using a microscope. • Everything around us is made from tiny building blocks we cannot see called particles. • Solids have a definite shape. • The shape of some solids can be changed 	<ul style="list-style-type: none"> • Rocks have different names and can be sorted into groups according to their properties • There are three main groups of rock called sedimentary, igneous and metamorphic • Sedimentary rocks are formed by layers of sediment under the sea • Metamorphic rocks are formed under immense heat and pressure • Igneous rocks are formed by volcanoes • Rocks can have small air spaces in them allowing water to pass through them • If a rock allows water to pass through, it is called permeable rock 	<ul style="list-style-type: none"> • There are three main states of matter: solids, liquids and gases. • Water exists in all these states of matter in nature. • Water can change into each state in both directions – we call this the Water Cycle. • Water evaporates from all water sources (e.g. puddles, lakes, oceans). • When water evaporates, it becomes water vapour. • The amount of water in the air is called humidity. • Condensation is when water vapour turns back into liquid. • High in the sky, the air is cooler and turns vapour back into water droplets. • There is always water vapour in the air and the temperature changes its appearance. • Clouds are formed of millions of water 	<p>Materials</p> <ul style="list-style-type: none"> • Materials can be grouped according to their properties. • A property is something that describes a material. • Some properties are visible; others can be found by testing. • Thermal conductivity means heat can be transferred through a material. • Materials are selected for uses that suit their properties. • A solution is a mixture of a solid in a liquid. • Dissolving is a process where one substance becomes incorporated with another to form a solution. • A solvent is a substance that can dissolve other substances. • Some substances are soluble; some are not. • There are methods for separating mixtures: sieves, filters, magnetism, evaporation. • All changes are either reversible or irreversible. <p>Meteorology</p> <ul style="list-style-type: none"> • Meteorology is the study of the weather. • The atmosphere is made up of several layers of air which 	
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				<p>by squashing, bending, twisting and stretching.</p> <ul style="list-style-type: none"> • The particles in a solid are tightly packed together and have a strong bond. • Liquids can be poured. • The shape of a liquid depends on the container it is being held in. • Water can be a solid and can also be a liquid. 	<ul style="list-style-type: none"> • If a rock doesn't allow water to pass through, it is called impermeable rock • Fossils are formed when rock forms around things that once lived • Fossils are rare and take thousands of years to form • Scientists who study fossils are called palaeontologists • Soil is made from rocks and organic matter • Organic matter is made from the decaying remains of living things 	<p>droplets and their shape, size and colour can tell us what weather will be like.</p> <ul style="list-style-type: none"> • When water droplets get large enough, often in dark cumulonimbus or nimbostratus clouds, they precipitate and fall as rain, sleet, hail or snow. • Precipitation returns water to the surface of the earth as part of the water cycle. 	<p>protect Earth from the Sun's energy.</p> <ul style="list-style-type: none"> • The atmosphere is essential for life on Earth. • Ozone is a gas that absorbs some of the sun's UV radiation. • By using certain harmful chemicals, humans created a hole in the ozone layer over Antarctica. • Since the harmful chemicals were banned, the hole in the ozone layer has been repairing. • Our climate is called a maritime climate, because it is largely influenced by the sea. • The polar maritime and the tropical maritime air masses bring wetter weather from the sea. • The polar continental and the tropical continental air masses bring drier weather from land. • The boundary where warm and cold air meet is called a front. • Warm fronts are symbolised by a line with red semi-circles. • Cold fronts are symbolised by a line with blue triangles. • When electrical charge builds up and moves through the atmosphere, it creates a flash of light and sound. 	
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