

Working Scientifically				Term	Topic	Need to Know	Steps to Success	Vocabulary	Prior Learning	National Curriculum	Significant scientists
<p><b>Asking questions and recognising that they can be answered in different ways:</b>  <i>Asking simple questions and recognising that they can be answered in different ways.</i></p>	<ul style="list-style-type: none"> <li>While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions.</li> </ul>	<ul style="list-style-type: none"> <li>The children answer questions developed with the teacher often through a scenario.</li> </ul>	<ul style="list-style-type: none"> <li>The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered</li> </ul>	Autumn 1	Animals including humans	<p>Children can describe what animals need to survive. Children can explain that animals grow and reproduce Children can explain why animals have offspring which grow into adults Children can describe the life cycle of some living things (bird: chicken, insect, mammal, amphibian, reptile) Children can explain the basic needs of</p>		<p>offspring reproduction            growth            exercise            breathing            hygiene            germs            disease            needs-            air            shelter            food            water            healthy-            hygiene            exercise            right            amount of            food types</p>	<p>Children can point out some of the differences between different animals. Children can sort photographs of living things and non-living things. Children can identify and name a variety of common animals (birds, fish, amphibians, reptiles, mammals, invertebrates). Children can describe how an animal is suited to its environment. Children can identify</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>notice that animals, including humans, have offspring which grow into adults</li> <li>find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</li> <li>describe the importance for humans of exercise, eating the right amounts of different</li> </ul>	<p>John Loudon McAdam (1756-1836)</p> <p>John Loudon McAdam was a Scottish engineer who modernised the way we build roads. He was the inventor of tarmac road surfacing – commonly called tarmac.</p> <p>John Dunlop (1840-1921)</p> <p>John Dunlop was a Scottish inventor who made the first rubber tyres for bicycles. He was</p>

						<p>animals, including humans for survival (water, food, air). Children can describe why exercise, balanced diet and hygiene are important for humans.</p> <p><b>Challenge</b> Children can explain that animals reproduce in different ways- links to life cycles.</p>
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	<p>and name a variety of common animals that are carnivores, herbivores and omnivores.</p> <p>Children can name the parts of the human body that they can see. Children can draw &amp; label basic parts of the human body. Children can identify the main parts of the human body and link them to their senses. Children can name the parts of an animal's body (ears, tail, paws, fins ect...) Children can name a range of domestic animals. Children</p>	<p>types of food, and hygiene.</p> <p>Julie Brusaw</p> <p>Julie is one of the inventors of Solar Roadways. Solar roadways use solar powered road panels to form a smart roadway.</p>	<p>however not the first person that came up with the idea or pneumatic tyres.</p>
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	<p>can classify animals by what they eat (carnivore, herbivore, omnivore). Children can compare the bodies of different animals.</p> <p><b>Challenge</b> Children can begin to classify animals according to a number of given simple criteria. Children can point out differences between living things and non-living things. Children can name some parts of the human body that cannot be seen. Children can say why certain animals</p>		
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	have certain characteristics- what are they used for? Why do they need them? Children can name a range of wild animals.		
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<p><b>Engage in practical enquiry to answer questions:</b> <i>Performing simple tests.</i></p>	<ul style="list-style-type: none"> <li>•The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher.</li> </ul>	<ul style="list-style-type: none"> <li>• They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.</li> </ul>	<p>Identifying and classifying.</p> <ul style="list-style-type: none"> <li>• Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting.</li> </ul>	<ul style="list-style-type: none"> <li>• They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.</li> </ul>	<p><b>Autumn 2</b></p>	<p>Uses of everyday materials &amp; WS</p>	<p>Children can describe the simple physical properties of a variety of everyday materials (shape, size, material, weight, texture). Children can compare and group a variety of materials based on their simple physical properties (shape, size, material, weight, texture). Children can explore how the shapes of solid objects can be changed (squashing, bending, twisting, stretching). Children can say which materials are natural,</p>	<p>Term 2- <b>What do We already know?</b> Flashback Friday Distinguish between an object and the material from which it is made (Year 1) <b>Working Scientifically-comparing and sorting</b> Name some everyday objects and the materials they are made from. Compare similarities and differences between materials. Sort materials based on properties and physical characteristics. Explore materials around the classroom- Create questions around- What if they were made of different materials? <b>Vocabulary</b> Use key vocabulary to describe the properties of materials. Explore the properties and uses of metal and wood- Compare. Ask</p>	<p>material texture group compare sort objects squash bend twist stretch natural man-made suitable wood metal plastic glass brick rock paper card surface friction John Dunlop John McAdam</p>	<p>Children can distinguish between an object and the material from which it is made. Children can describe materials using their senses (touch, sight, smell, sound). Children can describe materials using their senses, using <b>specific scientific words: rough, shiny, smooth, light, heavy, soft, thick, thin, flexible, strong, waterproof, loud, quiet.</b> Children can explain what material objects are made from</p>		
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						<p>which are man-made and make comparison s. Children can find out about people who developed useful new materials (Significant Scientists). Children can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper, cardboard for particular uses. Children can explain how things move on different surfaces.</p> <p><b>Challenge</b> Children can explain how</p>	<p>Questions. What other comparisons can the children make? Materials used for certain objects based on purpose. Brick= Walls. Glass= Windows etc... Introduce the idea of natural vs Man-made. <b>Absorbent &amp; Waterproof.</b> explore which materials would be absorbent or waterproof- Links to purpose. Why do we need materials to absorb water? Why do we need materials to be waterproof? Investigation- Useless Umbrella. <b>Reflective and non-reflective materials</b> Why is this an important property? What could these materials be used for? Investigation- Be safe, Be seen. <b>Insulation</b> What does this mean? Why might it be useful? What</p>	<p>and compare similarities and differences. Children can explain why a material might be useful for a specific job. Children can name different everyday materials. e.g. <b>wood, plastic, metal, water and rock</b> Children can sort materials into groups with a given criteria- <b>size, shape, strength, flexibility.</b> Children can explain how solid shapes can be changed by <b>squashing, bending, twisting and stretching.</b></p> <p>If the</p>		
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						<p>materials are changed by heating and cooling. Children can tell which materials cannot be changed back after being heated, cooled, bent, stretched or twisted.</p> <p>Or <b>Challenge</b> Children can describe the properties of different materials using words like, transparent or opaque,</p>	<p>for? Predict- What materials would keep things warm? Keep things cold? Investigation- Keeping the mouse warm. <b>Assessment Focus-</b> - Can I describe the simple physical properties of a variety of everyday materials? Can I compare and group a variety of materials based on their simple physical properties? Can I say which materials are natural, which are man-made and make comparisons? Can I identify and compare the suitability of a variety of everyday materials?</p>		<p>children complete the previous statements try some of these: <b>Challenge:</b> Children can describe similarities and differences between materials. Children can explain what happens to materials when they are heated: bread, ice, chocolate, wax, egg. Children can explain what happens to materials when they</p>	
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<p><b>Making observations and taking measurements:</b>  <i>Observing closely, using simple equipment.</i></p>	<ul style="list-style-type: none"> <li>• Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations.</li> </ul>	<ul style="list-style-type: none"> <li>• They begin to take measurements, initially by comparison, then using non-standard units.</li> </ul>			<p>Spring 1</p>	flexible, rigid.	<p>Term 3- <b>What do we remember?</b>  Flashback Friday- Recall facts from previous term's learning.  <b>Magnetic and non-magnetic materials.</b>  What do you notice about materials that are magnetic and not magnetic?  What everyday objects are magnetic?  Purpose.  Magnet investigations  <b>Significant Scientists-</b>  John Dunlop, John Loudon McAdams &amp; Julie Brushaw.  What did they invent? Why are their inventions important? How has it impacted our lives?  Compare their impact on society.  <b>Materials on Different surfaces</b>  Links to suitability of materials-  Shoes on mud and ice vs Ice skate on ice.  Cars on different road</p>		<p>are cooled: jelly, heated chocolate, water.</p>	<p>Pupils should be taught to:</p> <p>§ 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> <p>§ find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p>	<p>Dr Ernest Madu (born 1960)</p> <p>Dr Ernest Madu is a cardiologist. His work focuses on providing affordable healthcare in low-resource nations.</p>
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							<p>surfaces- Purpose of a tyre. Introduce the idea of friction- more friction = slows things down. Less friction= Things travel quicker.</p> <p>Investigation- Car on a ramp- different materials. How far does it travel on different surfaces? Conclude using results- more or less friction.</p> <p><b>How can solid shapes be changed?</b></p> <p>Introduce the idea of solids and liquids. Can children name any? Reflect on what the children know about some solid shapes. i.e. wood. Can it be bent, squashed, stretched and twisted and go back to its original form? Some solid materials cannot be stretched, twisted, bent or squashed. Some solid materials will break.</p> <p>Investigation- Explore</p>				
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							bending, twisting, squashing and stretching solid materials. <b>Assessment Focus-</b> Can I explore how the shapes of solid objects can be changed? Can I find out about people who developed useful new materials? Can I explain how things move on different surfaces? Can I describe the simple physical properties of a variety of everyday materials?					
<b><u>Recording and presenting evidence:</u></b> <i>Gathering and recording data to help in answering questions.</i>	•The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing.	• They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs.	• They classify using simple prepared tables and sorting rings.		<b>Spring 2</b>	Plants & WS	Children can describe what plants need to survive. Children can observe and describe how seeds	Term 4- <b>What do we already know?</b> Flashback Friday. Parts of a flower and tree (Year 1).	plants petals roots stem leaves seeds seedling bulbs light Water Air Space	Children can name the petal, stem, leaf, bulb, flower, seed, stem and root of a plant. Children can identify and name	Pupils should be taught to:  § observe and describe how seeds and bulbs grow into mature	David Douglas (1799-1834)  David Douglas was a Scottish botanist, best known as the namesake

<p><b>Answering questions and concluding:</b>  <i>Using their observations and ideas to suggest answers to questions.</i></p>	<ul style="list-style-type: none"> <li>The children recognise 'biggest and smallest', 'best and worst' etc. from their data.</li> </ul>				<b>Summer 1</b>	<p>and bulbs grow into mature plants. Children can find out &amp; describe how plants need water, light and a suitable temperature to grow and stay healthy.  <b>Challenge:</b> Children can describe what plants need to survive and link it to where they are found (environments/compare). Children can explain how plants grow and reproduce in different ways (compare).</p>		<p>Light nutrients warmth survive healthy germinate grow reproduce environment</p>	<p>common UK plants and trees. Children can recognise and compare deciduous and evergreen trees. Children can name the trunk, branches and root of a tree. Children can describe the parts of a plant (roots, stem, leaves, flowers).</p>	<p>plants § find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>	<p>of the Douglas-fir. He worked as a gardener, and explored the Scottish Highlands, North America, and Hawaii.</p>
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		<p>can describe a range of different habitats. Children can describe how plants and animals are suited to their habitat.</p> <p><b>Challenge</b> Children can name some characteristics of an animal that help it to live in a particular habitat. Children can describe what animals need to survive and link this to their habitats.</p>				<p>and animals in their habitats, including microhabitats &amp; describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.</p>	<p>of sea turtles. He was one of the co-founders of the Caribbean Conservation Corporation, which strives to save and monitor sea turtles in Costa Rica.</p>
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<p><b><u>Evaluating &amp; raising further questions:</u></b>  <i>Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</i></p>	<p>Although there are no specific objectives for year 1 &amp; 2, it will not hurt for the children to be exposed to this language and way of thinking. Evaluation, questioning and prediction skills are used across all areas of the curriculum.</p>	<p><i>This could be done verbally, as a whole class, in pairs or recorded as a class on flipchart paper or post its.</i></p>		
<p><b><u>Communicating findings:</u></b>  <i>Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</i></p>	<p>Although there are no specific objectives for year 1 &amp; 2, it will not hurt for the children to be exposed to this language and way of thinking. Evaluation, questioning and prediction skills are used across all areas of the curriculum.</p>	<p><i>This could be done verbally, as a whole class, in pairs or recorded as a class on flipchart paper or post its.</i></p>		