



## Knowledge and Concepts Map for Science

Year A	Forces (Yr 5) 	Light/Electricity (Yr 3) (Yr 6) 	Plants/Living Things and their Habitats (Yr 3) (Yr 5) 
Key Concepts	Magnetism, gravity, friction	Reflection, shadows Circuits	Germination, pollination, fertilisation, seed dispersal, <b>reproduction</b>
Key Vocabulary	Forces, friction, surface, gravity, weight, mass, air resistance, water resistance, upthrust.	Light, dark, reflection, reflect, ray, shadow, opaque, translucent, transparent  Circuit, symbol, current, amps, voltage, resistance	Roots, stem, leaves, flowers, nutrients, evaporation, fertilisation, petal, stamen, carpel, sepal, pollination, germination, seed dispersal, <b>asexual reproduction, gestation, reproduction</b>
Sticky Knowledge	<ul style="list-style-type: none"> <li>• Different surfaces create different amounts of friction.</li> <li>• The amount of friction depends on the roughness of the surface and the force between them.</li> <li>• Forces will change the motion of an object</li> <li>• Isaac Newton is famously thought to have developed his theory of gravity</li> <li>• Mass is how much matter is inside an object. It is measured in kilograms (kg).</li> <li>• Weight is how strongly gravity is pulling an object down. It is measured in newtons (N).</li> <li>• The Moon has a smaller mass than Earth so the gravitational pull on the Moon is</li> </ul>	<ul style="list-style-type: none"> <li>• Light travels in a straight line</li> <li>• When light hits an object, it is reflected.</li> <li>• A shadow is caused when light is blocked by an opaque object</li> <li>• A shadow is larger when an object is closer to the light source.</li> <li>• Lightning and static electricity are examples of electricity occurring naturally</li> <li>• Many everyday appliances rely on electricity for them to work.</li> <li>• Electricity can only flow around a complete circuit</li> <li>• Switches can be used to open or close a circuit</li> </ul>	<ul style="list-style-type: none"> <li>• How Water Moves through a Plant               <ol style="list-style-type: none"> <li>1. The roots absorb water from the soil.</li> <li>2. The stem transports water to the leaves.</li> <li>3. Water evaporates from the leaves.</li> <li>4. This evaporation causes more water to be sucked up the stem.</li> </ol> </li> <li>• A plant needs water, light, nutrients, air, space to grow</li> <li>• Seeds can be dispersed in a variety of ways.</li> <li>• Amphibians, such as frogs, are laid in eggs</li> <li>• Some animals, such as butterflies, go through metamorphosis to become an adult</li> <li>• Birds are hatched from eggs</li> <li>• Humans (mammals) develop inside their</li> </ul>



	<p>smaller than it is on Earth.</p> <ul style="list-style-type: none"> <li>Water resistance and air resistance are forms of friction</li> <li>Friction is sometimes helpful and sometimes unhelpful.</li> </ul>	<ul style="list-style-type: none"> <li>A conductor of electricity is a material that will allow electricity to flow through it</li> <li>Materials that are electrical insulators do not allow electricity to flow through them</li> <li>More cells or a higher voltage will make a bulb brighter</li> <li>More bulbs means the power is shared and the bulb will be dimmer</li> <li>If the circuit is broken the flow of current stops</li> </ul>	<p>mothers.</p> <ul style="list-style-type: none"> <li>Mammals use sexual reproduction to produce offspring</li> <li>Most plants contain male and female sex cells, but most plants can't fertilise themselves.</li> <li>Wind and insects transfer pollen from one plant to another</li> </ul>
<p>Scientific Skills LKS2  UKS2</p>	<p><b>Asking Questions and Carrying Out Fair and Comparative Tests</b></p> <p>start to raise their own relevant questions about the world around them in response to a range of scientific experiences;</p> <p>set up and carry out simple comparative and fair tests.</p> <p>explore and talk about their ideas, raising different kinds of scientific questions;</p> <p>ask their own questions about scientific phenomena;</p> <p>make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them;</p> <p>plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary</p> <p>use their test results to identify when further tests and observations may be needed;</p> <p>use test results to make predictions for further</p>	<p><b>Asking Questions and Carrying Out Fair and Comparative Tests</b></p> <p>start to raise their own relevant questions about the world around them in response to a range of scientific experiences;</p> <p>help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used;</p> <p>set up and carry out simple comparative and fair tests.</p> <p>with growing independence, raise their own relevant questions about the world around them in response to a range of scientific experiences;</p> <p>with increasing independence, make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions;</p> <p>explore and talk about their ideas, raising different kinds of scientific questions;</p>	<p><b>Asking Questions and Carrying Out Fair and Comparative Tests</b></p> <p>start to raise their own relevant questions about the world around them in response to a range of scientific experiences;</p> <p>recognise when a fair test is necessary;</p> <p>help decide how to set up a fair test, making decisions about what observations to make, how long to make them for and the type of simple equipment that might be used;</p> <p>set up and carry out simple comparative and fair tests</p> <p>explore and talk about their ideas, raising different kinds of scientific questions;</p> <p><b>Observing and Measuring Changes</b></p> <p>make systematic and careful observations;</p>



<p>tests</p> <p><b>Observing and Measuring Changes</b></p> <p>make systematic and careful observations;</p> <p>use a range of equipment, including thermometers and data loggers; d ask their own questions about what they observe;</p> <p>choose the most appropriate equipment to make measurements and explain how to use it accurately</p> <p>take measurements using a range of scientific equipment with increasing accuracy and precision;</p> <p>know the importance of taking repeat readings and take repeat readings where appropriate.</p> <p><b>Identifying, Classifying, Recording and Presenting Data</b></p> <p>group and classify things;</p> <p>collect data from their own observations and measurements;</p> <p>present data in a variety of ways to help in answering questions;</p> <p>use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge;</p> <p>record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables</p> <p>record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.</p> <p><b>Drawing Conclusions, Noticing Patterns and Presenting Findings</b></p>	<p>select and plan the most appropriate type of scientific enquiry to use to answer scientific questions;</p> <p>make their own decisions about what observations to make, what measurements to use and how long to make them for, and whether to repeat them;</p> <p>plan, set up and carry out comparative and fair tests to answer questions, including recognising and controlling variables where necessary;</p> <p>use their test results to identify when further tests and observations may be needed;</p> <p>use test results to make predictions for further tests.</p> <p><b>Observing and Measuring Changes</b></p> <p>make systematic and careful observations;</p> <p>use a range of equipment, including thermometers and data loggers;</p> <p>ask their own questions about what they observe;</p> <p>where appropriate, take accurate measurements using standard units using a range of equipment</p> <p>make careful and focused observations;</p> <p><b>Identifying, Classifying, Recording and Presenting Data</b></p> <p>group and classify things;</p> <p>collect data from their own observations and measurements;</p> <p>present data in a variety of ways to help in answering questions;</p> <p>use, read and spell scientific vocabulary correctly and with confidence, using their growing word</p>	<p>observe changes over time;</p> <p>use a range of equipment, including thermometers and data loggers;</p> <p>ask their own questions about what they observe;</p> <p>where appropriate, take accurate measurements using standard units using a range of equipment.</p> <p>make careful and focused observations;</p> <p><b>Identifying, Classifying, Recording and Presenting Data</b></p> <p>collect data from their own observations and measurements;</p> <p>present data in a variety of ways to help in answering questions;</p> <p>use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge;</p> <p>record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables</p> <p>independently group, classify and describe living things and materials;</p> <p>use and develop keys and other information records to identify, classify and describe living things and materials;</p> <p>record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs</p> <p><b>Drawing Conclusions, Noticing Patterns and Presenting Findings</b></p>
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	<p>draw simple conclusions from their results; make predictions; first talk about, and then go on to write about, what they have found out; report and present their results and conclusions to others in written and oral forms with increasing confidence notice patterns; draw conclusions based in their data and observations; use their scientific knowledge and understanding to explain their findings; read, spell and pronounce scientific vocabulary correctly; identify patterns that might be found in the natural environment; look for different causal relationships in their data; independently report and present their conclusions to others in oral and written forms.</p> <p><b>Using Scientific Evidence and Secondary Sources of Information</b></p> <p>make links between their own science results and other scientific evidence identify similarities, differences, patterns and changes relating to simple scientific ideas and processes; recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations. use primary and secondary sources evidence to justify ideas;</p>	<p>reading and spelling knowledge; record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables independently group, classify and describe living things and materials; decide how to record data from a choice of familiar approaches; record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs</p> <p><b>Drawing Conclusions, Noticing Patterns and Presenting Findings</b></p> <p>draw simple conclusions from their results; make predictions; first talk about, and then go on to write about, what they have found out; report and present their results and conclusions to others in written and oral forms with increasing confidence notice patterns; draw conclusions based in their data and observations; use their scientific knowledge and understanding to explain their findings; read, spell and pronounce scientific vocabulary correctly; look for different causal relationships in their data; discuss the degree of trust they can have in a set of results; independently report and present their conclusions</p>	<p>draw simple conclusions from their results; b make predictions; first talk about, and then go on to write about, what they have found out; report and present their results and conclusions to others in written and oral forms with increasing confidence read, spell and pronounce scientific vocabulary correctly; identify patterns that might be found in the natural environment; independently report and present their conclusions to others in oral and written forms</p> <p><b>Using Scientific Evidence and Secondary Sources of Information</b></p> <p>make links between their own science results and other scientific evidence; use straightforward scientific evidence to answer questions or support their findings; identify similarities, differences, patterns and changes relating to simple scientific ideas and processes; use primary and secondary sources evidence to justify ideas; recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact; use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; talk about how scientific ideas have</p>
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	<p>identify evidence that refutes or supports their ideas;</p> <p>recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact;</p> <p>use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas;</p> <p>talk about how scientific ideas have developed over time.</p>	<p>to others in oral and written forms.</p> <p><b>Using Scientific Evidence and Secondary Sources of Information</b></p> <p>make links between their own science results and other scientific evidence;</p> <p>use straightforward scientific evidence to answer questions or support their findings;</p> <p>identify similarities, differences, patterns and changes relating to simple scientific ideas and processes;</p> <p>recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.</p> <p>recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact;</p> <p>use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas;</p> <p>talk about how scientific ideas have developed over time</p>	<p>developed over time.</p>