



## Science Across the School

- This document should be used in conjunction with the Working Scientifically Progression Document when Planning Science. We also use the Kent Scheme for Science to support teachers.
- At Upton we teach knowledge first, so that children understand what they are testing or finding out during experiments
- Each Unit should also involve knowing about the work of a linked scientist. These scientists have been selected based on scientific relevance to the unit and intentionally include a mix of gender and race

### Year 3

Topic	Knowing me; Knowing You	NC
<b>Key Knowledge</b>	This is a transitional unit from KS2. We take from 15 different schools and need to be sure that they understand the basics of experimentation. Focus is not knowledge-based in this initial unit	
<b>Experiments to reinforce knowledge and develop practical Science</b>	<p>Investigate: what are our favourite playtime hobbies and games.            Conduct a survey.            Record results in a bar graph or chart and draw conclusions.</p> <p>Investigate: do children with longer legs jump further?            Children should plan this investigation with support, determine the variables, produce results and conclude from these</p>	<b>Investigate</b> <b>Conduct</b> <b>Record</b> <b>Results</b> <b>Conclusions</b>
<b>Term: 2</b>	Rock Bottom	<b>NC: Rocks</b>
<b>Key Knowledge</b>	<p>Compare and group together different types of rocks on the basis of the appearance and simple physical properties</p> <ul style="list-style-type: none"> <li>• To know that there are different types of rocks</li> <li>• To know the names of types of rocks and their features</li> <li>• Know that some rocks can be permeable/impermeable</li> </ul> <p>Describe how fossils are formed when things that have lived are trapped in the rock</p> <ul style="list-style-type: none"> <li>• To know what a fossil is and what it looks like</li> <li>• To know how a fossil is created</li> <li>• To know where fossils are found</li> </ul> <p>Recognise that soils are made from rocks and organic matter.</p> <ul style="list-style-type: none"> <li>• To know what soil is</li> <li>• To know what 'organic matter is</li> <li>• Know how soil is made</li> </ul>	<b>Organic matter</b> <b>Physical properties</b> <b>Permeable</b> <b>Impermeable</b> <b>Metamorphic</b> <b>Igneous</b> <b>Sedimentary</b> <b>Fossils</b> <b>Appearance</b> <b>Erode</b>
<b>Working Scientifically</b>	Investigate what types of soil are permeable Investigate how fossils are formed	

Term: 3	May the Force be With You	NC: Forces and Magnets
<b>Key Knowledge</b>	<p>Compare how things move on different surfaces -</p> <ul style="list-style-type: none"> <li>• Know what a contact force is</li> <li>• Know what forces involve contact</li> <li>• Know what we mean by friction</li> <li>• Know that friction is a force</li> <li>• Know what things will increase/decrease friction</li> <li>• Know what a fair test is</li> <li>• Know what variables are</li> <li>• Know that different surfaces will affect how things move due to the friction created</li> </ul> <p>Magnet Forces: Notice that some forces need contact between two objects, but magnetic forces can act at a distance</p> <ul style="list-style-type: none"> <li>• Know what magnets are</li> <li>• Know what magnets do</li> </ul> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> <ul style="list-style-type: none"> <li>• Know what we mean by ‘attract and repel’</li> <li>• Know how to test this</li> </ul> <p>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</p> <ul style="list-style-type: none"> <li>• Know what type of materials are attracted to magnets</li> <li>• Know why this is</li> </ul> <p>Describe magnets as having two poles Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p> <ul style="list-style-type: none"> <li>• Know that magnets have ‘poles’</li> <li>• Know that similar poles repel and opposite poles attract</li> <li>• Know that magnet will only attract certain materials</li> </ul>	<b>Contact</b> <b>Non-contact</b> <b>Magnet</b> <b>Magnetic field</b> <b>Attract</b> <b>Repel</b> <b>Friction</b> <b>Poles</b> <b>Balanced</b> <b>Unbalanced</b> <b>Properties of magnets</b> <b>Force</b>
<b>Working Scientifically</b>	Which surfaces produce the most friction Investigate compare and group magnetic and non-magnetic materials	
<b>Term: 4</b>	<b>Egypt</b>	<b>NC: Light</b>
<b>Key Knowledge</b>	<p>Recognise that they need light in order to see things and that dark is the absence of light</p> <ul style="list-style-type: none"> <li>• Know where light can come from – sources of light</li> </ul> <p>Notice that light is reflected from surfaces</p>	<b>Reflected</b> <b>Surface</b> <b>Light source</b>

	<ul style="list-style-type: none"> <li>• Know what surfaces are reflective and what are not</li> <li>• Know what makes something reflective</li> <li>• Know that light travels in straight lines</li> </ul> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <ul style="list-style-type: none"> <li>• Know why light from the sun can be dangerous</li> <li>• Know how to protect their eyes</li> </ul> <p>Recognise that shadows are formed when the light from a light source is blocked by a solid object</p> <ul style="list-style-type: none"> <li>• Know what a shadow is</li> <li>• Know what sort of things can block light -opaque, transparent, translucent</li> </ul> <p>Find patterns in the way that the size of shadows change.</p> <ul style="list-style-type: none"> <li>• Know that shadows change size the closer of further they are from a light source</li> <li>• Know that shadows can change length due to the position of the light source</li> </ul>	<p><b>Opaque</b>  <b>Transparent</b>  <b>Translucent</b>  <b>Absence of light</b>  <b>UV Rays</b>  <b>Patterns (how shadows change)</b>  <b>Object Formed</b></p>
<b>Working Scientifically</b>	look for patterns in what happens to shadows when the distance between the light source and the object changes.	
<b>Term: 5</b>	<b>It's a Small World</b>	<b>NC Plants</b>
<b>Key Knowledge</b>	<p>To identify and describe the functions of different parts of flowering plants: roots, stem/trunk, , leaves and flowers</p> <ul style="list-style-type: none"> <li>• Know what roots are, what they look like and what they do</li> <li>• Know what a stem/trunk is, what it looks like and what it does</li> <li>• Know what leave are, what they look like and what they do</li> <li>• Know what flowers are, what they look like and what they do</li> </ul> <p>Pupils should be introduced to the relationship between structure and function: the idea that every part has a job to do. They should explore questions that focus on the role of the roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction.</p> <p>Explore the requirements of plants for light and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant</p> <ul style="list-style-type: none"> <li>• Know what plants need to survive</li> <li>• Know that different plants have different requirements and be able to give an example of this</li> <li>• Know what will happen if plants don't get these requirements</li> </ul> <p>To investigate the way in which water is transported within plants.</p> <ul style="list-style-type: none"> <li>• Know that during transpiration, water moves through the roots, up the stem and to the leaves (water gradient)</li> </ul> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p> <ul style="list-style-type: none"> <li>• Know what pollination is and how it occurs</li> <li>• Know what seed formation is and how this happens</li> </ul>	<p><b>Stem</b>  <b>Roots</b>  <b>Functions</b>  <b>Nutrients</b>  <b>Requirements</b>  <b>Transported</b>  <b>Life Cycle</b>  <b>Pollination</b>  <b>Seed formation</b>  <b>Seed dispersal</b>  <b>Reproduction</b>  <b>Structure</b>  <b>Absorption</b></p>

	<ul style="list-style-type: none"> <li>• Know</li> <li>• what we mean by seed dispersal and how this happens</li> </ul>	
<b>Working Scientifically</b>	comparing the effect of different factors on plant growth: the amount of light, the amount of fertiliser; observe how water is transported in plants: white carnations into coloured water and observing how water travels up the stem to the flowers.	
<b>Term: 6</b>	<b>Healthy Humans</b>	<b>NC: Animals (including Humans)</b>
<b>Key Knowledge</b>	<p>Animals (including Humans)</p> <p>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.</p> <ul style="list-style-type: none"> <li>• Know what nutrition means</li> <li>• Know which foods help us stay fit and healthy</li> <li>• Know how we get nutrients from food</li> <li>• Know about protein, carbohydrates and fats</li> <li>• Know that calcium helps keep teeth and bones healthy</li> <li>• Know that different animals need different diets</li> <li>• Know how to create own healthy meals</li> <li>• Know that processed food are less healthy</li> </ul> <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</p> <ul style="list-style-type: none"> <li>• Know what a skeleton is and what it does</li> <li>• Know what the human skeleton looks like and the name of bones</li> <li>• know how muscles work</li> <li>• know how different creatures have different skeletons</li> <li>• know that some creatures do not have skeletons</li> <li>• know that some creatures have exoskeletons</li> </ul> <p>Ensure pupils know about the role of exercise in healthy living.</p> <ul style="list-style-type: none"> <li>• Know why exercise keeps us healthy</li> <li>• Know that exercise helps us breath better, makes us fitter and stronger</li> <li>• Know how much exercise is recommended</li> <li>• Know how to exercise and the different types of exercise</li> <li>• Know that exercise can help us stay mentally healthy</li> </ul> <p>Understand that everyone has the freedom to choose how healthy they are, but they should understand the risks</p>	<p>Nutrition</p> <p>Skeleton</p> <p>Support</p> <p>Protection</p> <p>Movement</p> <p>Muscles</p> <p>Function</p> <p>Diet</p> <p>Joints</p>
<b>Working Scientifically</b>	Research different food groups and how they keep us healthy. Design meals based on what they find out.	

## Year 4

Term: 1	Life on Earth	NC: States of Matter
<b>Key Knowledge</b>	<p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p> <ul style="list-style-type: none"> <li>• Know what we mean by evaporation and condensation</li> <li>• Know that water will evaporate more rapidly if temperature is greater</li> <li>• Know how evaporation and condensation are involved in the water cycle evaporation and condensation</li> </ul> <p>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)</p> <ul style="list-style-type: none"> <li>• Know what we mean by melting and boiling;</li> <li>• Know what we mean by 'changing state'</li> <li>• know the temperature at which water becomes a gas or ice.</li> <li>• Know how to investigate the temperatures at which differing solids change state</li> </ul> <p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <ul style="list-style-type: none"> <li>• Know what we mean by a solid; liquid; gas – give me examples</li> <li>• Know the features of a solid, a liquid and a gas</li> <li>• Know some everyday things that are solids, liquids and gases</li> </ul>	<b>Solids</b> <b>Liquids</b> <b>Gases</b> <b>State of matter</b> <b>Atoms</b> <b>Particles</b> <b>Energy</b> <b>Precipitation</b> <b>Evaporation</b> <b>Condensation</b> <b>Transformation</b> <b>Biology</b> <b>Climate</b> <b>Water Cycle</b>
<b>Working Scientifically</b>	Research the temperature at which some solids change state	
<b>Term 2: Our Planet:</b>	Note for 23-24 -consider adding in a famous Scientist linked to volcanoes/Earthquakes Science of earthquakes and volcanoes	
Term:	Light it Up	NC: Electricity
<b>Key Knowledge</b>	<p>Identify common appliances that run on electricity</p> <ul style="list-style-type: none"> <li>• Know what electricity is and where it comes from (overview)</li> <li>• Know which everyday appliances run on electricity</li> <li>• Know that batteries are stores of electricity</li> </ul> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <ul style="list-style-type: none"> <li>• Knows the basic parts of a circuit, including cells, wires, bulbs, switches and buzzers</li> </ul> <p>Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery</p>	<b>Switch</b> <b>Bulbs</b> <b>Buzzer</b> <b>Battery</b> <b>Electricity</b> <b>Appliances</b> <b>Insulators</b> <b>Conductors</b> <b>Circuit</b> <b>Battery</b> <b>Mains</b>

	<ul style="list-style-type: none"> <li>• Know that for an appliance to work within a circuit, it has to be part of a complete loop with a battery.</li> </ul> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <ul style="list-style-type: none"> <li>• Knows that a switch in a circuit is a temporary break in an otherwise 'complete circuit'.</li> <li>• Know the recognised symbols used to represent components of a circuit and uses these to represent a circuit pictorially</li> </ul> <p>Recognise some common conductors and insulators, and associate metals with being good conductors.</p> <ul style="list-style-type: none"> <li>• Know what an insulator is</li> <li>• Know what a conductor is</li> <li>• Know that metals conduct electricity but some are relatively poor conductors while some conduct very well and are chosen for this purpose.</li> </ul>	<b>Cell</b>
<b>Working Scientifically</b>	Which metals are conductors? How to use a switch within a circuit	
<b>Term: 4 Romans</b>	Romans -Sound taught separately	
<b>Key Knowledge</b>	<p style="text-align: center;"><b>Sound</b></p> <p>Identify how sounds are made, associating some of them with something vibrating</p> <ul style="list-style-type: none"> <li>• Know what vibrating means</li> <li>• Know how sound travels in waves</li> <li>• Know the correlation between pitch and the object.</li> <li>• Know that faster vibrations =higher pitch and this is associated with tighter and shorter strings</li> <li>• Know the correlation between the volume of a sound and the strength of the vibrations that produced it.</li> </ul> <p>Recognise that vibrations from sounds travel through a medium to the ear</p> <ul style="list-style-type: none"> <li>• Know how sound travels through air; water and other mediums</li> <li>• Know that sound travel fastest through solids and slowest through gases.</li> <li>• Know that sound cannot travel in a vacuum</li> <li>•</li> </ul> <p>Find patterns between the pitch of a sound and features of the object that produced it</p> <ul style="list-style-type: none"> <li>• Know that the faster the sound wave the higher the pitch and be able to give examples</li> </ul> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <ul style="list-style-type: none"> <li>• Know that stronger vibrations lead to louder volume</li> </ul> <p>Recognise that sounds get fainter as the distance from the sound source increases</p> <ul style="list-style-type: none"> <li>• Know that vibrations from sound sources travel through solids, liquids, and gases. As they travel, they lose some of their energy</li> </ul>	<p style="text-align: center;">Vibrations Decibel Sound waves Ear drum Amplitude Pitch Volume Vacuum</p> <p>Echo Strength Flexibility Physical property</p>

<b>Working Scientifically</b>	They might make earmuffs from a variety of different materials to investigate which provides the best insulation against sound. – use the sound meters Experiment with differing instruments to determine what influences pitch	
<b>Term: 5 Greece</b>	Greece	<b>NC Animals (including humans)</b>
<b>Key Knowledge</b>	The Ancient Greeks as the first dentists!  Knows and can identify the different types of teeth in humans and their simple functions -Know the different types of teeth in humans Know that these teeth have different shapes based on their functions Know the function of each type of tooth Know what things damage teeth Know how we can keep teeth healthy  (We have moved the digestive system into Y6 to link better based on learning observation)	<b>Canine Molar Incisors Plaque Decay Enamel</b>
<b>Working Scientifically</b>	finding out what damages teeth and how to look after them. Testing toothpastes and the work of Washington Stephens comparing the teeth of carnivores and herbivores and suggesting reasons for differences;	
<b>Term: 6</b>	Beautiful Broadstairs	<b>NC: Living Things and their Habitats Animals Including Humans</b>
<b>Key Knowledge</b>	Recognise that living things can be grouped in a variety of ways. <ul style="list-style-type: none"> <li>• Know what we mean by living things</li> <li>• Know features of living things that are the same and that are different</li> <li>• Know about the different ways in which they can be grouped based on similar features</li> <li>• Recognise that environments can change and that this can sometimes pose dangers to living things.</li> <li>• Know that an environment is surroundings or conditions in which a person, animal, or plant lives or operates.</li> <li>• Know about different environments</li> <li>• Know what can cause change to these environments</li> <li>• Know what the impact of change can be for living things</li> </ul> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <ul style="list-style-type: none"> <li>• Know what a classification key is and how it works</li> <li>• Know how to use a classification key</li> </ul>	<b>Classification Keys Vertebrate Amphibians Environment Invertebrate Mammal Reptile Consumers Producers Prey Predators</b>

	<ul style="list-style-type: none"> <li>• Know how this can be used in our coastal areas</li> <li>• Construct and interpret a variety of food chains, identifying producers, predators and prey.</li> <li>• Know what a food chain is</li> <li>• Know what producer, predator, prey mean</li> <li>• Know about some food chains that are common to the area</li> <li>• Know how to investigate these using our local beaches</li> </ul> <p>Pupils should explore examples of human impact (both positive and negative) on environments, for example, the positive effects of nature reserves, ecologically planned parks, or garden ponds, and the negative effects of population and development, litter or deforestation.</p>	
<b>Working Scientifically</b>	Making keys to explore and identify local plants and animals Investigate food chains locally	
<b>Year 5</b>		
<b>Term: 1</b>	<b>Changes</b>	<b>NC: Properties and Changes of Materials</b>
<b>Key Knowledge</b>	<p>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p> <ul style="list-style-type: none"> <li>• Know what key words mean such as solvent, solution and solute</li> <li>• Know what dissolving means</li> <li>• Know which materials dissolve in liquid</li> <li>• Know what saturation point is</li> <li>• Know how to separate by evaporating</li> </ul> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating, decanting and magnetism</p> <ul style="list-style-type: none"> <li>• Know how to filter, sieve, evaporate and decant</li> <li>• Know which type of mixture should be separated by each of these processes</li> <li>• Demonstrate that dissolving, mixing and changes of state are reversible changes</li> <li>• Know what reversible and irreversible changes are</li> <li>• Know how to set up an experiment to show this</li> </ul> <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> <p>Know which type of changes cannot be reversed and give examples</p>	<b>Solution</b> <b>Solute</b> <b>Solvent</b> <b>Soluble</b> <b>Insoluble</b> <b>Dissolve</b> <b>Evaporation</b> <b>Condensation</b> <b>Freezing</b> <b>Melting</b> <b>Molecules</b>



	<p>Explore reversible changes, including evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes.</p> <p>Pupils should explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda.</p> <p>Find out about Ruth Benefit, who invented wrinkle-free cotton.</p>	
<b>Working Scientifically</b>	<p>They could observe and compare the changes that take place, when burning different materials or baking bread or cakes;</p> <p>investigate the conditions that effect dissolving -i.e. when saturation point is reached how to decant;</p> <p>how to separate materials using filtering; magnetism; evaporation</p>	
<b>Term: China -</b>	23-24 – add key scientist /inventor	
<b>Term: 3</b>	<b>Invaders and Settlers</b>	<b>Forces</b>
<b>Key Knowledge</b>	<p>Recognise that some mechanisms, including levers and pulleys allow a smaller force to have a greater effect.</p> <ul style="list-style-type: none"> <li>• Know how levers and pulleys allow loads to be moved with less effort</li> <li>• Know the forces involved when using levers and pulleys</li> <li>• Know where levers and pulley might be used</li> </ul> <p>(Viking boat construction link to DT)</p> <p>Identify the effects of air resistance, water resistance and friction, which act between moving surfaces</p> <ul style="list-style-type: none"> <li>• Know how these forces act on an object</li> <li>• Know why these forces act on an object</li> <li>• Know that an object must overcome these forces to move</li> <li>• Know how scientists have endeavoured to overcome these forces through streamlining and aerodynamics</li> </ul> <p>(Viking boat movement link)</p>	<p><b>Air resistance</b></p> <p><b>Water resistance</b></p> <p><b>Friction</b></p> <p><b>Gravity</b></p> <p><b>Streamlined</b></p> <p><b>Aerodynamics</b></p> <p><b>Momentum</b></p> <p><b>Force</b></p> <p><b>Levers, pulleys, gears</b></p> <p><b>Mechanism</b></p>
<b>Working Scientifically</b>	Linking with DT pupil produced own pulley systems	
<b>Term: 4 The Maya</b>	No – add key scientist	
<b>Key Knowledge</b>	During the stunning start pupils learn about the invention of systems of mathematics	
<b>Working Scientifically</b>		
<b>Term: 5</b>	To Infinity and Beyond	<b>NC Earth and Space Properties and Changes of Materials. Forces</b>

<p><b>Key Knowledge</b></p>	<p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system</p> <ul style="list-style-type: none"> <li>• Know what a solar system is</li> <li>• Know about the eight planets in our solar system</li> <li>• Know their order in distance from the sun</li> <li>• Know that the sun is a star and the centre of our solar system</li> <li>• Know that the planets orbit the sun</li> <li>• Know how long it take for the Earth to orbit the son</li> <li>• Know about how ideas about the solar system have developed, understanding how the geocentric model of the solar system gave way to the heliocentric model by considering the work of scientists such as Ptolemy, Alhazen and Copernicus</li> </ul> <p>Describe the movement of the Moon relative to the Earth</p> <ul style="list-style-type: none"> <li>• Know that the moon is a celestial body that orbits a planet</li> <li>• Know that other planets also have moons</li> <li>• Know how long it takes the moon to orbit the earth</li> </ul> <p>Describe the Sun, Earth and Moon as approximately spherical bodies</p> <ul style="list-style-type: none"> <li>• Know that the sun is much larger than the earth and that the moon is smaller than both. Use relative scale</li> </ul> <p>Use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky</p> <ul style="list-style-type: none"> <li>• Know that areas facing the sun experience daytime and vice-versa</li> <li>• Know that our day-time will be night-time for other parts of the world</li> <li>• Know where the sun will be at different points of the day</li> <li>• Know how to work scientifically by: comparing the time of day at different places on the Earth through internet links</li> <li>• constructing simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day;</li> </ul> <p style="text-align: center;"><b>Properties and Changes of Materials.</b></p> <p>Pupils should build a more systematic understanding of materials by exploring and comparing the properties of a broad range of materials, including relating these to what they learnt about magnetism in year 3 and about electricity in year 4</p> <ul style="list-style-type: none"> <li>• Compare and group together everyday materials on the basis of how hard they are</li> <li>• Know the names of common materials</li> <li>• Know the properties of these materials - flexible; rigid; thickness; magnetic; conduct electricity?</li> <li>• Know how to create sorting tables</li> </ul> <p>Which materials would be best for using for space rockets and why</p>	<p><b>Solar system</b>  <b>Planets</b>  <b>Earth</b>  <b>Moon</b>  <b>Spherical bodies</b>  <b>Orbit</b>  <b>Rotation</b>  <b>Revolution</b>  <b>Axis</b>  <b>Longitude</b>  <b>Latitude</b>  <b>Tropics</b>  <b>Equator</b></p>
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	<p>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</p> <p>What materials would be best to construct a space rocket? Design and explain? (we have moved this objective into this unit for greater understanding in context)</p> <p style="text-align: center;"><b>Forces</b></p> <p>(we have moved this objective into this unit for greater understanding in context)</p> <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>Know what gravity is</p> <p>Know that gravity keeps us on the ground</p> <p>Know that gravity is created by objects of large mass</p> <p>Know why there is less gravity in space</p> <p>Know that by moving we are pushing against gravity and that this contributes to keeping our muscles healthy</p> <p>Know about the work of Galileo</p> <p>Know that the difference in falling speed is caused by air resistance and that two objects in a vacuum would fall at same rate</p>	
<b>Working Scientifically</b>	<p>If larger surface area increases air resistance – pupils can explore this with differing sized card as they run</p> <p>They can then use this information to design a parachute designing and making a variety of parachutes and carrying out fair tests to determine which designs are the most effective</p> <p>If resistance in water is increased by large surface area – pupils can make and test boats of different shapes</p> <p>Create shadow clock/sundial</p>	
<b>Term: 6</b>	Walking on the Wild Side	<b>NC Living Things and their Environments Animals (including Humans)</b>
<b>Key Knowledge</b>	<p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <ul style="list-style-type: none"> <li>• Know what life cycle is</li> <li>• Know how the life cycles of these creatures are different</li> <li>• Know about the work of a famous naturalist or animal behaviourists, for example, David Attenborough and Jane Goodall.</li> </ul> <p>Describe the life process of reproduction in some plants and animals.</p> <ul style="list-style-type: none"> <li>• know about different types of reproduction, including sexual and asexual</li> </ul>	<b>Plant specific:</b> <b>Anther</b> <b>Stigma</b> <b>Stamen</b> <b>Style</b> <b>Sepal</b> <b>Ovary</b> <b>Ovule</b>

	<ul style="list-style-type: none"> <li>• Know about reproduction in plants, and sexual reproduction in animals.</li> <li>• Know how to observe changes in an animal over a period of time (by hatching and rearing chicks), comparing how different animals</li> </ul> <p style="text-align: center;"><b>Animals (including Humans)</b></p> <p>Describe the changes as humans develop to old age.</p> <ul style="list-style-type: none"> <li>• know the stages of growth and development and when these happen (timeline)</li> <li>• Know about the changes experienced in puberty.</li> <li>• Know how to use research to find out the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows</li> </ul> <p>Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the changes experienced in puberty.</p>	<b>Filament</b> <b>Receptacle</b> <b>Petal</b> <b>Sexual reproduction</b> <b>Asexual reproduction</b> <b>Life cycle</b> <b>Mammals</b> <b>Amphibian</b> <b>Behaviourist</b> <b>Naturalist</b>
<b>Working Scientifically</b>	<p>They might observe changes in an animal over a period of time (for example, by hatching and rearing chicks), comparing how different animals reproduce and grow</p> <p>Does environment contribute to animals living longer? Pupils might work scientifically by: observing and comparing the life cycles of plants and animals in their local environment with other plants and animals around the world (in the rainforest, in the oceans, in desert areas and in prehistoric times), asking pertinent questions and suggesting reasons for similarities and differences</p>	
<b>Year 6</b>		
<b>Term: 1</b>	Fun at the Fair	<b>NC Electricity</b>
<b>Key Knowledge</b>	<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <ul style="list-style-type: none"> <li>• Know what voltage is and how it can be measured</li> <li>• Know that the brightness or volume of a component can be increased with increased voltage up to a point</li> </ul> <p>Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches</p> <ul style="list-style-type: none"> <li>• Know how these components functions within a circuit</li> <li>• Know how to use push switches for purpose</li> <li>• Use recognised symbols when representing a simple circuit in a diagram.</li> </ul>	<b>Friction</b> <b>Conductors</b> <b>Voltage</b> <b>Electrical current</b> <b>Component</b> <b>Variable</b> <b>Resister</b>
<b>Working Scientifically</b>	<p>Systematically identifying the effect of changing one component at a time in a series circuit and the effect on a bulb</p> <p>Create an alarm to stop people using a display bed in a bed shop using bulbs buzzers and switches</p>	
<b>Term: 2</b>	<b>Changing World</b>	<b>NC Living Things and their Habitats</b>

<p><b>Key Knowledge</b></p>	<p>Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals</p> <ul style="list-style-type: none"> <li>• Know that broad groups, such as animals, micro-organism and plants, can be further subdivided</li> <li>• Know how to classify into vertebrates and invertebrates</li> <li>• Know why living things are placed into specific groups</li> </ul> <p>Give reasons for classifying plants and animals based on specific characteristics.</p> <ul style="list-style-type: none"> <li>• Know about the work of Carl Linnaeus</li> </ul> <p>Evolution and Inheritance</p> <p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</p> <ul style="list-style-type: none"> <li>• Know in more detail how fossils are formed and about differing types of fossils</li> </ul> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> <ul style="list-style-type: none"> <li>• Know what evolution means</li> <li>• Know that the variation in offspring over time can make animals more – or less- able to survive in an environment</li> <li>• Know some examples of this</li> <li>• Know what natural selection means</li> <li>• Know about the work of Charles Darwin and other scientists</li> <li>• Know how living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels.</li> </ul> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</p> <ul style="list-style-type: none"> <li>• Know what inheritance means</li> <li>• Know that characteristics are passed from parents to their offspring. Consider examples in humans and animals</li> </ul>	<p><b>Adaptation</b>  <b>Evolution</b>  <b>Natural Selection</b>  <b>Inheritance</b>  <b>Cloning</b>  <b>Species</b>  <b>Mutation</b>  <b>Classification</b>  <b>Genetics</b>  <b>DNA</b>  <b>Offspring</b></p>
<p><b>Working Scientifically</b></p>	<p>using classification systems and keys to identify animals and plants</p>	
<p><b>Term: 3 and 4 -we'll Meet Again</b></p>	<p>Light -taught separately</p>	<p><b>NC: Light</b></p>
<p><b>Key Knowledge</b></p>	<p>Recognise that light appears to travel in straight lines</p> <ul style="list-style-type: none"> <li>• Know that light travels in straight lines and reflects in straight lines</li> </ul>	<p><b>Electromagnetic spectrum</b>  <b>Refraction</b>  <b>Translucent</b></p>

	<p>Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye</p> <p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</p> <ul style="list-style-type: none"> <li>• Know how light enters the eye and how an object is seen</li> <li>• Know about the angle of incidence and the angle of reflection</li> </ul> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</p> <ul style="list-style-type: none"> <li>• Know that shadows will grow larger if the light source is closer to the object</li> <li>• Know that straight line travel of light is why the shadow is the same shape as the object</li> </ul>	<p><b>Transparent</b> <b>Opaque</b> <b>Light source</b></p>
<b>Working Scientifically</b>	<p>Building of a periscope</p> <p>investigate the relationship between light sources, objects and shadows by using shadow puppets</p>	
<b>Term: 5 Being human</b>		<b>NC Animals (including Humans)</b>
<b>Key Knowledge</b>	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood</p> <ul style="list-style-type: none"> <li>• Know the role of the heart and how it works</li> <li>• Know how blood and oxygen are transported around the body</li> <li>• Know what blood is and what it does</li> <li>• Know what blood vessels are and their role</li> </ul> <p>Describe the simple functions of the basic parts of the digestive system in humans (we have moved this from Y4 based on learning observations)</p> <p>Know what digesting means</p> <p>Know the parts of the body associated with digestion and their function</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <ul style="list-style-type: none"> <li>• Know how and why these aspects can lead to us being healthy/unhealthy</li> <li>• Know what specific nutrients we need</li> <li>• Know how exercise makes us healthier by exercising the heart and muscles</li> <li>• Know that all medicines are drugs but not all drugs are medicine</li> <li>• Know about the effect of key drugs on the body. Know the negative impacts of common drugs and how some common drugs can save lives</li> </ul> <p>Describe the ways in which nutrients and water are transported within animals, including humans.</p> <ul style="list-style-type: none"> <li>• Know the steps that take place for nutrients and water to get from the stomach to the cells that need them</li> </ul>	<p><b>Nervous system</b> <b>Nutrients</b> <b>Oxygenated</b> <b>Deoxygenated</b> <b>Muscles</b> <b>Joints</b> <b>Skeleton</b> <b>Circulatory system</b> <b>Transportation</b> <b>Digestion</b> <b>Oesophagus</b> <b>Intestine</b></p>

	<ul style="list-style-type: none"> <li>• Know the importance of hydration for the body</li> </ul>	
<b>Working Scientifically</b>	<p>Model the digestive system and its actions</p> <p>Recognise and measure the impact of exercise on heart rate</p>	
<b>Term: 6</b>	Moving on Up	
<b>Key Knowledge</b>	This unit is a transitional unit. We liaise with the local secondary schools our pupils will be going to and ask for their input into key areas of learning they find Y7 need to reinforce and plan from this	