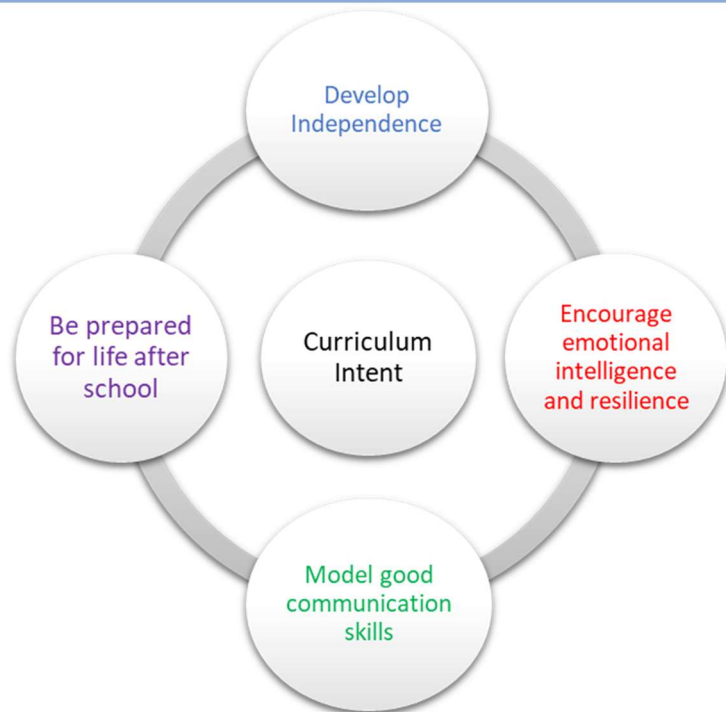


## KS2 Science Long Term Plan 2021-22



### School Pedagogy:

Penkford School has a child centred pedagogy. The school adopts an inclusive, transformative pedagogy as we believe that a child's 'capacity to learn can change and be changed for the better as a result of what happens and what people do in the present' (*Hart et al. 2004, P166*). Learning is about shared communication between staff and pupils. Implementation of our curriculum intent is underpinned by Rosenshine's 10 Principles of Instruction (*Rosenshine, 2012*). All learning sessions include the following elements; reference to curriculum intent, recap of knowledge and skills, assessment for learning and pupil voice.

### Subject Specific Pedagogy:

Pedagogical approach in science lessons at Penkford is underpinned by Rosenshine's Principles of Instruction (*Rosenshine, 2012*). EHCP documentation is used to inform planning within science and we are flexible in our approach to content coverage and delivery. Disciplinary knowledge progression is planned in conjunction with appropriate substantive knowledge topic areas

### Subject Intent:

KS2: Recognise the presence of Science in the world around them and its significance in their daily lives. Pupils will be supported with their learning whilst also being equipped to develop as independent learners.

KS3: Promote a lifelong interest and awareness of how science can be used to understand and explain natural phenomena, and also recognition of the potential for human impact within this.

KS4: Pupils will have an enthusiasm for learning about scientific phenomena with an appreciation of how accreditation for their learning is relevant in securing employment, including an awareness of the range of careers which having a science education can be the starting point for.

NB: 'WS' refers to working scientifically. Working scientifically disciplinary skills are developed intrinsically throughout each topic alongside the delivery of substantive knowledge – there are certain topics that provide opportunities to develop certain WS skills in particular – these are highlighted in the long-term planning.

Key Stage 2 Science Long Term Plan	Topic/Learning Pathway	Key Vocabulary	Links to previous learning (Component Skills)	Links to wider curriculum
Autumn 1	<p><b>KS2EE</b>  <b>Animals Including Humans (Stage 4)</b></p> <ul style="list-style-type: none"> <li>Describe the simple functions of the basic parts of the digestive system in humans.</li> <li>Identify the different types of teeth in humans and their simple functions.</li> <li>Construct and interpret a variety of food chains, identifying producers, predators and prey</li> </ul> <p><b>Disciplinary Skills:</b></p> <ul style="list-style-type: none"> <li>I talk about how I have grouped, sorted and / or classified objects.</li> </ul> <p><b>Living Things and their Habitats (Stage 4)</b></p> <ul style="list-style-type: none"> <li>Recognise that living things can be grouped in a variety of ways.</li> <li>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.</li> <li>Recognise that environments can change and that this can sometimes pose danger to living things.</li> </ul>	<p>Herbivore, Carnivore, Digestive system, tongue, mouth, teeth, oesophagus, stomach, gall bladder, small intestine, pancreas, large intestine, liver, tooth, canine, incisor, molar, premolar, producer, consumer.</p> <p>Environment, flowering, nonflowering, plants, animals, vertebrates, fish, amphibians, reptiles, mammals, invertebrate, human impact, nature reserves, deforestation.</p>	<ul style="list-style-type: none"> <li>Know how nutrients, water and oxygen are transported within animals and humans.</li> <li>Know about the importance of a nutritious, balanced diet.</li> <li>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</li> <li>Describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.</li> <li>Identify and name a variety of plants and animals in their habitats, including micro habitats.</li> <li>Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify</li> </ul>	<p><b>PSD:</b></p> <ul style="list-style-type: none"> <li>Health and Wellbeing topic link: healthy food, nutrition, dental health</li> </ul> <p><b>Art:</b></p> <ul style="list-style-type: none"> <li>Henry Rousseau: exploration of some of his famous works portraying rainforests and explore his style and the features of his paintings. The range of paintings clearly show aspects of the habitats and food chains based around rainforests.</li> </ul> <p><b>History:</b></p> <ul style="list-style-type: none"> <li>Stone Age to Iron Age: Research the types of animals which were around in the Stone Age and then create a simple classification key to identify the animals in that period or otherwise to extend it into comparing and contrasting the sabre tooth tiger for example compared to the Siberian tiger etc.</li> </ul>

Key Stage 2 Science Long Term Plan	Topic/Learning Pathway	Key Vocabulary	Links to previous learning (Component Skills)	Links to wider curriculum
	<p><b>Disciplinary Skills:</b></p> <ul style="list-style-type: none"> <li>I can make my own keys</li> <li>I can use keys to classify and identify range of things</li> <li>I decide about what observations to make</li> </ul>		<p>and name the different sources of food.</p>	
	<p><b>KS2NN Animals Including Humans (Stage 5)</b></p> <ul style="list-style-type: none"> <li>Describe the changes as humans develop to old age</li> </ul> <p><b>Evolution and Inheritance (Stage 6)</b></p> <ul style="list-style-type: none"> <li>Know about evolution and can explain what it is.</li> <li>Know how fossils can be used to find out about the past.</li> <li>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</li> <li>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution- recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago</li> </ul>	<p>Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty, Hormone, Physical, Emotional</p> <p>Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics, Variation, Inherited, Environmental, Mutation, Competition, Survival of the Fittest, Evidence</p>	<ul style="list-style-type: none"> <li>Describe the simple functions of the basic parts of the digestive system in humans.</li> <li>Identify the different types of teeth in humans and their simple functions.</li> <li>Understand there is a variety of life on Earth</li> <li>Know that some animal's differences are important to their survival</li> <li>Know how animals and plants reproduce</li> <li>Know how fossils form over time</li> </ul>	<p><b>MH 2.8</b></p> <p><b>PSD:</b></p> <ul style="list-style-type: none"> <li>Health and Wellbeing topic link: puberty, responsibilities of increased independence</li> </ul> <p><b>History:</b></p> <ul style="list-style-type: none"> <li>Stone Age to Iron Age topic link: Considering the vast areas which the Stone Age people lived in not only Europe but also Asia, Africa, America and Australasia this gives the children opportunities to investigate and study a range of different habitats due to climatic differences, and how this affects the animals and plants which live there – adaptation examples</li> </ul> <p><b>Art:</b></p> <ul style="list-style-type: none"> <li>Prehistoric/Stone Age art topic link: how the study of fossil</li> </ul>

Key Stage 2 Science Long Term Plan	Topic/Learning Pathway	Key Vocabulary	Links to previous learning (Component Skills)	Links to wider curriculum
	<p><b>Disciplinary Skills:</b></p> <ul style="list-style-type: none"> <li>• I can use my science experiences to explore ideas and raise different kinds of questions</li> <li>• I recognise which secondary sources will be most useful</li> <li>• I am beginning to separate opinion from fact</li> </ul>			evidence can be considered alongside historical art markings
Autumn 2	<p><b>KS2EE Electrical Circuits (Stage 4)</b></p> <ul style="list-style-type: none"> <li>• Identify common appliances that run on electricity.</li> <li>• Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.</li> <li>• 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.</li> <li>• Recognise that a switch opens and closes the circuit and associate this with whether or not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors.</li> </ul>	Electricity, electric current, appliances, mains, crocodile clips, wires, bulb, battery cell, battery holder, motor, buzzer, switch, conductor, electrical insulator, component.	<ul style="list-style-type: none"> <li>• May have some understanding that objects need electricity to work.</li> <li>• May understand that a switch will turn something on or off.</li> </ul>	<p><b>PSD:</b></p> <ul style="list-style-type: none"> <li>• Health and Wellbeing topic link: being aware of ‘screen time’ – pupils could complete a questionnaire about their own screen time/electrical appliance usage – relate this to the work done in half term 1 in PSD about the importance of physical activity and adequate sleep.</li> <li>• Using electricity safely – increased independence.</li> </ul> <p><b>C2.4</b> give examples of what it means to have a career  <b>C2.9</b> be aware of how to keep yourself safe and well when you are learning and playing</p>

Key Stage 2 Science Long Term Plan	Topic/Learning Pathway	Key Vocabulary	Links to previous learning (Component Skills)	Links to wider curriculum
	<ul style="list-style-type: none"> <li>Know the difference between a conductor and an insulator; giving examples of each.</li> <li>Safety when using electricity.</li> </ul> <p><b>Disciplinary Skills:</b></p> <ul style="list-style-type: none"> <li>I help decide what observations to make and how long to make them for</li> <li>I collect data from my observations and measurements</li> <li>I use standard measurements</li> </ul> <p><b>Sound (Stage 4)</b></p> <ul style="list-style-type: none"> <li>Know how sound is made associating some of them with vibrating.</li> <li>Know what happens to a sound as it travels from its source to our ears.</li> <li>Know the correlation between the volume of a sound and the strength of the vibrations that produced it.</li> <li>Know how sound travels from a source to our ears.</li> <li>Know the correlation between pitch and the object producing a sound.</li> </ul>	<p>Amplitude, volume, quiet, loud, ear, pitch, high, low, particles, instruments, wave</p>	<ul style="list-style-type: none"> <li>May have some understanding that objects make different sounds.</li> <li>Some understanding that they use their ears to hear sounds.</li> <li>Know about their different senses.</li> </ul>	<p><b>Music:</b></p> <ul style="list-style-type: none"> <li>Making instruments to demonstrate the link between vibration strength and the volume of a sound</li> <li>Understanding ‘pitch’</li> </ul> <p><b>Art:</b></p> <ul style="list-style-type: none"> <li>synaesthesia cognate – medical condition – hear colours, see sounds.</li> </ul>
	<p><b>KS2NN</b></p> <p><b>Sound (Stage 4 – not covered last year due to Covid disruption)</b></p> <ul style="list-style-type: none"> <li>Know how sound is made associating some of them with vibrating.</li> </ul>	<p>Amplitude, volume, quiet, loud, ear, pitch, high, low, particles, instruments, wave</p>	<ul style="list-style-type: none"> <li>May have some understanding that objects make different sounds.</li> <li>Some understanding that they use their ears to hear sounds.</li> </ul>	<p><b>Music:</b></p> <ul style="list-style-type: none"> <li>Making instruments to demonstrate the link between vibration strength and the volume of a sound</li> <li>Understanding ‘pitch’</li> </ul>

Key Stage 2 Science Long Term Plan	Topic/Learning Pathway	Key Vocabulary	Links to previous learning (Component Skills)	Links to wider curriculum
	<ul style="list-style-type: none"> <li>• Know what happens to a sound as it travels from its source to our ears.</li> <li>• Know the correlation between the volume of a sound and the strength of the vibrations that produced it.</li> <li>• Know how sound travels from a source to our ears.</li> <li>• Know the correlation between pitch and the object producing a sound.</li> </ul>		<ul style="list-style-type: none"> <li>• Know about their different senses.</li> </ul>	<p><b>Art:</b></p> <ul style="list-style-type: none"> <li>• synaesthesia cognate – medical condition – hear colours, see sounds.</li> </ul>
Spring 1	<p><b>KS2EE</b> <b>Materials: States of Matter (Stages 4 and 5)</b></p> <p><b>Stage 4:</b></p> <ul style="list-style-type: none"> <li>• Compare and group materials together, according to whether they are solids, liquids or gases.</li> <li>• Observe that some materials change state when heated or cooled, and measure and research the temperature at which this happens in degrees Celsius.</li> <li>• Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> </ul> <p><b>Disciplinary Skills:</b></p> <ul style="list-style-type: none"> <li>• I am learning to use equipment e.g. data loggers, appropriately.</li> </ul> <p><b>Stage 5:</b></p>	<p>Solid, liquid, gas, particles, state, materials, properties, matter, melt, freeze, water, ice, temperature, process, condensation, evaporation, water vapour, energy, precipitation, collection</p>	<ul style="list-style-type: none"> <li>• Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</li> <li>• Compare and group together a variety of everyday materials on the basis of their simple physical properties.</li> <li>• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.</li> </ul> <p>(Stage 4 knowledge required before progressing to stage 5 learning outcomes)</p>	<p><b>Geography:</b></p> <ul style="list-style-type: none"> <li>• ‘Rivers’ topic link: Fact file 4 in the Anglican Waters Booklet (<a href="http://Primaryresources(anglianwater.co.uk)">Primary resources (anglianwater.co.uk)</a>)</li> <li>• Pupils may not realise that water has to be treated in order to make it safe to drink. Fact File 4 allows children to explore the differences in water taken from a variety of sources. Opportunities to investigate dissolving, filtration and reversible changes.</li> <li>• In order to investigate whether there are any solutes dissolved in tap water or local river water, children could use a tea light and tea light stand to evaporate the water.</li> </ul>

Key Stage 2 Science Long Term Plan	Topic/Learning Pathway	Key Vocabulary	Links to previous learning (Component Skills)	Links to wider curriculum
	<ul style="list-style-type: none"> <li>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</li> <li>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</li> <li>Use knowledge of solids, liquids, and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</li> </ul> <p><b>Disciplinary Skills:</b></p> <ul style="list-style-type: none"> <li>I can select suitable equipment and information from sources provided</li> <li>I recognise that a series of measurements or observations should be made in an investigation</li> </ul>			<ul style="list-style-type: none"> <li>Discuss the ethics of drinking bottled water instead of tap water</li> <li>'The Water Cycle' topic link: evaporation, condensation</li> </ul>
	<p><b>KS2NN</b> <b>Earth and Space (Stage 5)</b></p> <ul style="list-style-type: none"> <li>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system</li> <li>Describe the movement of the Moon relative to the Earth</li> <li>Describe the Sun, Earth and Moon as approximately spherical bodies</li> </ul>	<p>Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation, waxing, waning, crescent, gibbous. Mercury, Venus, Mars, Jupiter, Saturn, Uranus, Neptune, planets, solar</p>	<ul style="list-style-type: none"> <li>Understand changes in weather patterns and seasons.</li> <li>Compare how things move on different surfaces.</li> <li>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</li> </ul>	<p><b>English:</b></p> <ul style="list-style-type: none"> <li>'The 1000 Year Old Boy' Half Term 4 Science Fiction topic link</li> </ul> <p><b>Maths:</b></p> <ul style="list-style-type: none"> <li>Understanding 'spherical' and 'sphere'</li> <li>Number of hours in a day</li> </ul>

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	<ul style="list-style-type: none"> <li>Describe the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.</li> </ul>	system, day, night, rotate, orbit, axis, spherical, geocentric, heliocentric.	<ul style="list-style-type: none"> <li>Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing</li> </ul>	<ul style="list-style-type: none"> <li>Number of months in an Earth year</li> <li>Understanding the term 'elliptical'</li> </ul> <p><b>Geography:</b></p> <ul style="list-style-type: none"> <li>'Polar Extremes': resource which looks at the climate and weather in the two poles <a href="#">Polar extremes   Discovering Antarctica</a> Children could also use this resource as part of their learning about the earth's rotation and seasons. Many children and adults believe that it is warmer in the summer because the earth is closer to the sun at this time of year. This resource could be used to help address this misconception.</li> </ul>
Spring 2	<p><b>KS2EE</b> <b>Living Things and Their Habitats (Stage 5)</b></p> <ul style="list-style-type: none"> <li>Know the life cycle of different living things, e.g. Mammal, amphibian, insect bird.</li> <li>Know the process of reproduction in plants.</li> <li>Know the process of reproduction in animals.</li> </ul> <p><b>Disciplinary Skills:</b></p>	Reproduction, Sexual, Asexual, Pollination, Dispersal, reproduction, cell, fertilisation, pollination, male, female, pregnancy, young, mammal, metamorphosis, amphibian, insect, egg, embryo, bird, plant	<ul style="list-style-type: none"> <li>Construct and interpret a variety of food chains, identifying producers, predators and prey</li> <li>Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.</li> <li>Identify and name a variety of plants and animals in their</li> </ul>	<p><b>MH 2.9</b></p> <p><b>English:</b></p> <ul style="list-style-type: none"> <li>'Hodgeheg' fiction book topic link: life cycles of a mammal</li> </ul> <p><b>Forest School:</b></p> <ul style="list-style-type: none"> <li>Explore and identify the life cycles of different living things found in outdoor learning spaces</li> </ul> <p><b>Art:</b></p> <ul style="list-style-type: none"> <li>As part of children's research into the life processes of plants, they</li> </ul>



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	<ul style="list-style-type: none"> <li>Gather, record, classify and present data in a variety of ways to help answer questions</li> <li>I can use ICT to find information relevant to my investigation as well as other sources provided</li> </ul>		habitats, including micro habitats.	<p>will look at the role that petals play in reproduction.</p> <ul style="list-style-type: none"> <li>Children could spend time carrying out surveys into the colours of petals; they could also carry out independent research into the types of insects that pollinate different flowers and why that is. Bees, for example, are often attracted to bright blue and violet colours.</li> </ul>
	<p><b>KS2NN</b> <b>Animals including Humans (Stage 6)</b></p> <ul style="list-style-type: none"> <li>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</li> <li>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.</li> <li>Describe the ways in which nutrients and water are transported within animals, including humans.</li> </ul> <p><b>Disciplinary Skills:</b></p> <ul style="list-style-type: none"> <li>Identify scientific evidence to support or refute ideas or arguments</li> </ul>	Oxygenated, Deoxygenated, Valve, Exercise, Respiration Circulatory system, heart, lungs, blood vessels, blood, artery, vein, pulmonary, alveoli, capillary, digestive, transport, gas exchange, villi, nutrients, water, oxygen, alcohol, drugs, tobacco.	<ul style="list-style-type: none"> <li>Describe the changes as humans develop to old age.</li> </ul>	<p><b>MH 2.1, 2.2, 2.3, 2.4, 2.7</b></p> <p><b>English:</b></p> <ul style="list-style-type: none"> <li>'Scavengers' fiction book topic link: food and nutrition</li> </ul> <p><b>History:</b></p> <ul style="list-style-type: none"> <li>'The Romans' topic link: Investigate the diets of ancient cultures using safe 'fake poo' (STEM.org.uk activity). Adapt poo samples to include diet of different types of Romans, e.g. roman senator, soldier, laundry boy and child. Children then work scientifically to identify each of the different people from their poo. Developing investigative skills, the fake poo can lead onto</li> </ul>

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				<p>a discussion of how modern diets differ from ancient ones.</p> <p><b>Physical Education:</b></p> <ul style="list-style-type: none"> <li>Pupils explore their own movement and learn about how their bodies are affected by exercise.</li> </ul>
<p>Summer 1</p>	<p><b>KS2EE</b> <b>Forces (Stage 3)</b></p> <ul style="list-style-type: none"> <li>Compare how things move on different surfaces.</li> <li>Know how a simple pulley works and use making lifting an object simpler</li> <li>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</li> <li>Observe how magnets attract and repel each other and attract some materials and not others.</li> <li>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.</li> <li>Describe magnets as having two poles.</li> <li>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</li> </ul> <p><b>Disciplinary Skills:</b></p> <ul style="list-style-type: none"> <li>Set up simple practical enquiries, comparative and fair tests</li> </ul>	<p>Force, push, pull, friction, surface, magnet, magnetic, magnetic field, pole, north, south, attract, repel, compass</p>	<ul style="list-style-type: none"> <li>May have an awareness of how to make things stop and start, using simple pushes and pulls.</li> <li>They may know about floating and sinking.</li> </ul>	<p><b>Geography:</b></p> <ul style="list-style-type: none"> <li>Response to natural disasters: use of pulleys. Pulleys are often used to help rescue people after earthquakes and other emergencies. Providing a context for children to design a product involving pulleys.</li> </ul> <p><b>Cultural Capital:</b></p> <ul style="list-style-type: none"> <li><b>Educational Visit: Climbing Wall</b> Children could be taken climbing when learning about pulleys. This could also be linked to rescuing people after an earthquake.</li> </ul>

Key Stage 2 Science Long Term Plan	Topic/Learning Pathway	Key Vocabulary	Links to previous learning (Component Skills)	Links to wider curriculum
	<ul style="list-style-type: none"> <li>• I know when a fair test is necessary</li> <li>• I help to decide how to set up a fair test</li> </ul>			
	<p><b>KS2NN</b> <b>Forces (Stage 5)</b></p> <ul style="list-style-type: none"> <li>• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object and the impact of gravity on our lives.</li> <li>• Identify the effects of air resistance, water resistance and friction, which act between moving surfaces.</li> <li>• Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</li> </ul> <p><b>Disciplinary Skills:</b></p> <ul style="list-style-type: none"> <li>• Plan different types of enquiries, including recognise and controlling variables where necessary</li> <li>• I recognise when and how to set up comparative and fair tests</li> <li>• I can explain which variables are needed to be controlled</li> <li>• I explain why these should be controlled</li> <li>• I can decide a method of recording data to suit the results e.g., a two-column table</li> <li>• I'm beginning to plot line graphs</li> </ul>	<p>Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys, force, push, pull, opposing, streamline, brake, mechanism, lever, cog, machine, pulley.</p>	<ul style="list-style-type: none"> <li>• Compare how things move on different surfaces.</li> <li>• Know how a simple pulley works and use making lifting an object simpler</li> <li>• Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</li> <li>• Observe how magnets attract and repel each other and attract some materials and not others.</li> <li>• Compare and group together a variety of everyday materials based on whether they are attracted to a magnet and identify some magnetic materials.</li> <li>• Describe magnets as having two poles.</li> <li>• Predict whether two magnets with attract or repel each other, depending on which poles are facing.</li> </ul>	<p><b>STEM:</b></p> <ul style="list-style-type: none"> <li>• 'Vertically Challenged': demonstrate key ideas and concepts used in designing and constructing buildings such as: how levers and pulleys work, the properties of materials and the forces involved in different structures. <a href="#">Vertically Challenged   STEM</a></li> </ul> <p><b>Cultural Capital:</b></p> <ul style="list-style-type: none"> <li>• <b>Educational Visit: Climbing Wall</b> Children could be taken climbing when learning about pulleys. This could also be linked to rescuing people after an earthquake.</li> </ul> <p><b>Maths:</b></p> <ul style="list-style-type: none"> <li>• Creating and completing simple tables</li> <li>• Developing an understanding of how a line graph shows the relationship between two variables</li> <li>• Begin to plot line graphs</li> </ul>

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Summer 2	<p><b>KS2EE</b> <b>Light (Stage 3)</b></p> <ul style="list-style-type: none"> <li>Recognise that they need light in order to see things and that dark is the absence of light.</li> <li>Notice that light is reflected from surfaces.</li> <li>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</li> <li>Recognise that shadows are formed when the light from a light source is blocked by a solid object.</li> <li>Find patterns in the way that the sizes of shadows change.</li> </ul> <p><b>Disciplinary Skills:</b></p> <ul style="list-style-type: none"> <li>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions</li> <li>With help I look for differences, similarities, changes and patterns in data</li> </ul>	<p>Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent.</p>	<ul style="list-style-type: none"> <li>May have some knowledge of where light comes from.</li> <li>May have seen their shadows and may know they appear when it is sunny.</li> <li>Have some understanding of a reflection.</li> <li>May understand they need light to be able to see things.</li> </ul>	<p><b>PSD:</b></p> <ul style="list-style-type: none"> <li>Health and Wellbeing topic link: sun safety. Use of suncream, shade, hats, drinking plenty of water.</li> </ul> <p><b>C2.9</b> be aware of how to keep yourself safe and well when you are learning and playing</p>
	<p><b>KS2NN</b> <b>Light (Stage 6)</b></p> <ul style="list-style-type: none"> <li>Recognise that light appears to travel in straight lines.</li> <li>Use the idea that light travels in straight lines to explain that objects are seen</li> </ul>	<p>Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent,</p>	<ul style="list-style-type: none"> <li>Recognise that they need light in order to see things and that dark is the absence of light.</li> <li>Notice that light is reflected from surfaces.</li> </ul>	<p><b>History:</b></p> <ul style="list-style-type: none"> <li>Use of periscopes: simple periscopes were used in WW1, with the addition of two simple lenses, for observation purposes in the trenches to avoid enemy gunfire. Tanks use periscopes</li> </ul>

Key Stage 2 Science Long Term Plan	Topic/Learning Pathway	Key Vocabulary	Links to previous learning (Component Skills)	Links to wider curriculum
	<p>because they give out or reflect light into the eye.</p> <ul style="list-style-type: none"> <li>• 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.</li> <li>• Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.</li> <li>• Know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.</li> </ul> <p><b>Disciplinary Skills:</b></p> <ul style="list-style-type: none"> <li>• I use relevant scientific language and illustrations to discuss, communicate and justify my ideas</li> </ul>	<p>translucent. Reflect Absorb Emitted Scattered Refraction</p>	<ul style="list-style-type: none"> <li>• Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.</li> <li>• Recognise that shadows are formed when the light from a light source is blocked by a solid object.</li> <li>• Find patterns in the way that the sizes of shadows change.</li> </ul>	<p>extensively: they allowed military personnel to check out their situation without leaving the safety of the tank. Pupils could make a periscope when exploring the idea that light travels in straight lines <a href="#">Periscopes   STEM</a></p>