



Science Progression Document – Cylce B LKS2



Term 1: Rocks (Year 3 unit)

| National Curriculum Objectives | Key Knowledge | Vocabulary | Key Scientists | Prior Learning | Future Learning |
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| <p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock.</p> <p>Recognise that soils are made from rocks and organic matter.</p> | <p>There are different types of rock.</p> <p>There are different types of soil.</p> <p>Soils change over time.</p> <p>Different plants grow in different soils.</p> <p>Fossils tell us what has happened before.</p> <p>Fossils provide evidence.</p> <p>Paleontologists use Fossils to find out about the past.</p> <p>Fossils provide evidence that living things have changed over time.</p> | <p>Rocks, igneous, metamorphic, sedimentary, anthropic, permeable, impermeable, chemical fossil, body fossil, trace fossil, Mary Anning, cast fossil, mould fossil, replacement fossil, extinct, organic matter, top soil, sub soil, base rock.</p> | <p>Mary Anning (Discovery of Fossils)</p> <p>Inge Lehmann (Earth's Mantle)</p> | <p>KS1:</p> <p>Distinguish between an object and the material from which it is made.</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.</p> <p>Describe the simple physical properties of a variety of everyday materials.</p> <p>Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p> <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper</p> | <p>Year 5:</p> <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>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids, and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p> <p>Give reasons based on evidence from</p> |



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| | | | | and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. | comparative and fair tests, for the particular uses of everyday materials, including wood, metals and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. Explain that some changes result in the formation of new materials, and this kind of change is usually not reversible, including changes associated with burning and the action of acid on bicarbonate of soda. |
| Key Question(s): | Working Scientifically opportunities: | Big Question - Assessment opportunity | Linked Texts | | |
| How are the soils different? Which do you think has best drainage? Which is more likely to lead to flooding? | Competitive tests - How does adding different amounts of sand to soil affect how quickly water drains through it? | What are rocks and soils like? | The Pebble in My Pocket (Meredith Hooper) Stone Girl, Bone Girl (Laurence Anholt) | | |



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| <p>How many soil types have we found? Where might you find more? How might the soil be different in different countries? What rock is best for a kitchen chopping board? What might be the issues with various materials and what they have to withstand? What types of rocks are there? How do rocks change? What would grow best in your soil? Why do you think worms are important to the creation of soil? How can we use composting to make our own soil? Does it currently look like real soil? How long do you think this process will take and why?</p> | <p>Identify and Classify - Can you use the identification key to find out the name of each of the rocks in your collection?</p> <p>Observation Overtime - How does tumbling change a rock over time? What happens when water keeps dripping on a sandcastle?</p> <p>Pattern Seeking - Is there a pattern in where we find volcanos on planet Earth?</p> <p>Research - Who was Mary Anning and what did she discover?</p> | | <p>The Street Beneath My Feet (Charlotte Guillain & Yuval Zommer)</p> | | |
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| <p>How are fossils created? Why do fossils help us find out about historical events? If you could fossilise an object what would it be?</p> | | | | | |
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Term 2: Light (Year 3 unit)

| National Curriculum Objectives | Key Knowledge | Vocabulary | Key Scientists | Prior Learning | Future Learning |
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| <p>Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by a solid object.</p> | <p>There must be light for us to see. Without light it is dark. We need light to see things even shiny things. Transparent materials let light through them and opaque materials don't let light through. Beams of light bounce off some materials (reflection). Shiny materials reflect light beams better than non-shiny materials. Light comes from a source</p> | <p>Light source, dark, reflect, ray, mirror, bounce, visible, beam, sun, glare, travel, straight, opaque, shadow, block, transparent, translucent.</p> | <p>James Clerk Maxwell (Visible and Invisible Waves of Light)</p> | <p>Year 1: Observed changes across the four seasons. Observed and describe weather associated with the seasons and how day length varies.</p> <p>Children may: Have some knowledge of where light comes from. Have seen their shadows and may know they appear when it is sunny. Have some understanding of a reflection.</p> | <p>Year 6: Recognise that light appears to travel in straight lines. 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. 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> |



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| <p>Find patterns in the way that the sizes of shadows change.</p> | | | | <p>May understand they need light to be able to see things.</p> | <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. Know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc.</p> |
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| Key Question(s): | Working Scientifically opportunities: | Big Question - Assessment opportunity | Linked Texts | | |
| <p>A coin is lost, what would be the best way to find it? (Turn the lights out and see it shine? Use a torch to see it reflect?) How does distance from a light source affect how bright it looks? How does being in darkness affect your sense of hearing? What colour would be the best to make a safety jacket from?</p> | <p>Competitive tests - How does the distance between the shadow puppet and the screen affect the size of the shadow? Which pair of sunglasses will be best at protecting our eyes? Identify and Classify - How would you organise these light sources into natural and artificial sources?</p> | <p>What is a shadow?</p> | <p>The Owl Who Was Afraid of the Dark (Jill Tomlinson) The Dark (Lemony Snicket) The Firework-Maker's Daughter (Philip Pullman)</p> | | |



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| <p>How does the colour of a material affect how reflective it is? What would be the best material to make a blind for a baby's room? How does thickness of a material affect how much light can pass through it? How many pieces of tracing paper are as translucent as a single piece of white paper? How does the shape of a mirror affect how the light reflects? How can we change the darkness, size and shape of a shadow?</p> | <p>Observation Overtime - When is our classroom darkest? Is the Sun the same brightness all day?</p> <p>Pattern Seeking - Are you more likely to have bad eye sight and to wear glasses if you are older?</p> <p>Research - How does the Sun make light?</p> | | | | |
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Term 3 and 4: Forces and Magnets (Year 3 unit)

| National Curriculum Objectives | Key Knowledge | Vocabulary | Key Scientists | Prior Learning | Future Learning |
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| Compare how things move on different surfaces. | Magnets exert attractive and repulsive forces on each other. | Force, push, pull, friction, surface, magnet, magnetic, magnetic field, pole, | William Gilbert (Theories on Magnetism) Andre Marie Ampere | Year 2: May have an awareness of how to make things | Year 5: Explain that unsupported objects fall towards the Earth because of the |



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| <p>Know how a simple pulley works and use making lifting an object simpler</p> <p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p> <p>Observe how magnets attract and repel each other and attract some materials and not others.</p> <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> <p>Describe magnets as having two poles.</p> <p>Predict whether two magnets with attract or repel each other, depending on which poles are facing.</p> | <p>Magnets exert non-contact forces, which work through some materials.</p> <p>Magnets exert attractive forces on some materials.</p> <p>Magnet forces are affected by magnet strength, object mass, distance from object and object material.</p> | <p>north, south, attract, repel, compass</p> | <p>(Founder of Electro-Magnetism)</p> | <p>stop and start, using simple pushes and pulls.</p> <p>They may know about floating and sinking.</p> | <p>force of gravity acting between the Earth and the falling object and the impact of gravity on our lives.</p> <p>Identify the effects of air resistance, water resistance and friction, which act between moving surfaces.</p> <p>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p> <p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>Describe the movement of the Moon relative to the Earth.</p> <p>Describe the Sun, Earth and Moon as approximately spherical bodies.</p> <p>Describe the idea of the Earth's rotation to explain day and night and</p> |
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| Key Question(s): | Working Scientifically opportunities: | Big Question - Assessment opportunity | Linked Texts | | |
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| <p>What are magnetic materials? How can we find out? Can I make a magnetic material non-magnetic? How far away does a magnet have to be before it attracts a magnetic material? How far away can the magnetic attraction between two magnets be experiences? Is the repulsive force the same size? How is the magnetic attraction of repulsion force affected by putting materials between the magnets? Are bigger magnets stronger?</p> | <p>Competitive tests - How does the mass of an object affect how much force is needed to make it move? Which magnet is strongest? Which surface is best to stop you slipping?</p> <p>Identify and Classify - Which materials are magnetic?</p> <p>Observation Overtime - If we magnetise a pin, how long does it stay magnetised for?</p> <p>Pattern Seeking - Do magnetic materials always conduct electricity? Does the size and shape of a</p> | <p>How can we move magnets?</p> | <p>The Iron Man (Ted Hughes)</p> <p>Mrs Armitage: Queen of the Road (Quentin Blake)</p> <p>Mr Archimedes' Bath (Pamela Allen)</p> | | <p>the apparent movement of the sun across the sky.</p> |



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| <p>How could you use magnets to measure the number of pages in a book?</p> | <p>magnet affect how strong it is?</p> <p>Research - How have our ideas about forces changed over time? How does a compass work?</p> | | | | |
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Term 5: Animals including Humans (Year 4 unit)

| National Curriculum Objectives | Key Knowledge | Vocabulary | Key Scientists | Prior Learning | Future Learning |
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| <p>Describe the simple functions of the basic parts of the digestive system in humans.</p> <p>Identify the different types of teeth in humans and their simple functions.</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p> | <p>Animals have teeth to help them eat.</p> <p>Different types of teeth do different jobs.</p> <p>Food is broken down by the teeth and further in the stomach and intestines where nutrients go into the blood.</p> <p>The blood takes nutrients around the body.</p> <p>Nutrients produced by plants move to primary consumers then to</p> | <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>Ivan Pavlov (Digestive System Mechanisms)</p> <p>Joseph Lister (Discovered Antiseptics)</p> | <p>Year 3: Identify that animals, including humans, need the right types and amount of nutrition, and they cannot make their own food; they get their nutrition from what they eat.</p> <p>Know how nutrients, water and oxygen are transported within animals and humans.</p> <p>Know about the importance of a nutritious, balanced diet.</p> <p>Identify that humans</p> | <p>Year 5: Know the life cycle of different living things, e.g. Mammal, amphibian, insect bird.</p> <p>Know the differences between different life cycles.</p> <p>Know the process of reproduction in plants.</p> <p>Know the process of reproduction in animals.</p> |



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| | secondary consumers through food chains. | | | and some other animals have skeletons and muscles for support, protection and movement | |
| Key Question(s): | Working Scientifically opportunities: | Big Question - Assessment opportunity | Linked Texts | | |
| <p>What different types of food are there? Why do we need a variety of different foods? Do all organisms eat the same things? Why do some people need different diets? (weightlifter vs marathon runner) Why are teeth important? What happens to our food? What is our digestive system? How does our food turn into poo and wee?</p> | <p>Competitive tests - In our class, are omnivores taller than vegetarians?</p> <p>Identify and Classify - What are the names for all the organs involved in the digestive system? How can we organise teeth into groups?</p> <p>Observation Overtime - How does an egg shell change when it is left in cola?</p> <p>Pattern Seeking - Are foods that are high in energy always high in sugar?</p> | <p>What do our bodies do with the food we eat?</p> | <p>Human Body Odyssey (Werner Holzwarth)</p> <p>Crocodiles Don't Brush Their Teeth (Colin Fancy)</p> <p>Wolves (Emily Gravett)</p> | | |



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| | Research - How do dentists fix broken teeth? | | | | |
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Term 6 - Sound (Year 4 NC)

| National Curriculum Objectives | Key Knowledge | Vocabulary | Key Scientists | Prior Learning | Future Learning |
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| <p>Know how sound is made associating some of them with vibrating.</p> <p>Know what happens to a sound as it travels from its source to our ears.</p> <p>Know the correlation between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Know how sound travels from a source to our ears.</p> <p>Know the correlation between pitch and the object producing a sound.</p> | <p>Sound travels from its source in all directions and we hear it when it travels to our ears.</p> <p>Sound travel can be blocked.</p> <p>Sound spreads out as it travels.</p> <p>Changing the shape, size and material of an object will change the sound it produces.</p> <p>Sound is produced when an object vibrates.</p> <p>Sound moves through all materials by making them vibrate.</p> <p>Changing the way an object vibrates changes it's sound.</p> | <p>Amplitude, volume, quiet, loud, ear, pitch, high, low, particles, instruments, wave.</p> | <p>Aristotle (Sound Waves)</p> <p>Gailileo Galilei (Frequency and Pitch of Sound Waves)</p> <p>Alexander Graham Bell (Invented the Telephone)</p> | <p>May have some understanding that objects make different sounds.</p> <p>Some understanding that they use their ears to hear sounds.</p> <p>Know about their different senses.</p> | <p>In KS3: Frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound</p> <p>Sound needs a medium to travel, the speed of sound in air, in water, in solids.</p> <p>Sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal.</p> <p>Auditory range of humans and animals.</p> |



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| | Bigger vibrations produce louder sounds and smaller vibrations produce quieter sounds. Faster vibrations (higher frequencies) produce higher pitched sounds | | | | |
| Key Question(s): | Working Scientifically opportunities: | Big Question - Assessment opportunity | Linked Texts | | |
| How can you change the volume of a sound? How does the size of an ear trumpet affect the volume of sound detected? How does the type of material affect how well it blocks a sound? How does thickness of material affect how well it blocks a sound? Which materials vibrate better and produce louder sounds? Can we identify any patterns? Which materials make the best string | Competitive tests - How does the volume of a drum change as you move further away from it? How does the length of a guitar string/tuning fork affect the pitch of the sound? Are two ears better than one? Identify and Classify - Which material is best to use for muffling sound in ear defenders? Observation Overtime - When is our classroom the quietest? | How can we make different sounds? | Horrid Henry Rocks (Francesca Simon) Moonbird (Joyce Dunbar) The Pied Piper of Hamelin (Natalia Vasquez) | | |



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| <p>telephone components? (tin cans, paper cups, plastic cups, wire, cable, string, plastic or elastic - predict and test) How does length of the tube (when making a straw oboe) affect the pitch and volume? Can you predict the relative pitch of tuning forks from the patterns of ripples they make in the water?</p> | <p>Pattern Seeking - Is there a link between how loud it is in school and the time of day? If there is a pattern, is it the same in every area of the school?</p> <p>Research - Do all animals have the same hearing range?</p> | | | | |
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