

## Nelson Academy Science Subject Overview and Endpoints 25-26

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Reception	See EYFS Overview	See EYFS Overview	See EYFS Overview	See EYFS Overview	See EYFS Overview	See EYFS Overview
Year 1	<p>Keeping warm in the ice age</p> <ul style="list-style-type: none"> <li>- Animals and their needs</li> <li>- Classification. Herbivores, carnivores, omnivores and extinct animals.</li> </ul> <p style="color: red;">Insulation test – how to keep a cup of coffee warm.</p> <p><a href="#">Y1 Insulators.pdf</a></p> <p style="color: red;">What do owls eat? Herbivore, carnivore, omnivore?</p> <p><a href="#">Pellet Pack and FSC Guide Bundle - The Barn Owl Trust</a></p> <p>Whose poo? Investigation <a href="#">Science- Investigation Whose-poo.docx</a></p>	<p>Seasons and the Weather.</p> <p>Materials (weather effecting materials)</p> <ul style="list-style-type: none"> <li>- Recognise and name widely used materials.</li> <li>- Explain why materials are chosen for specific tasks based on their properties</li> <li>- Natural vs man made</li> <li>- Four seasons and local weather patterns</li> <li>- Sun as a source of light and warmth</li> <li>- Daily weather changes</li> </ul> <p style="color: red;">Insulation test – how to keep a cup of coffee warm.</p> <p><a href="#">Y1 Insulators.pdf</a></p>	<p>Taking care of the Earth.</p> <ul style="list-style-type: none"> <li>- Importance of conservation to conserve limited resources.</li> <li>- Practical measures for conserving energy and resources.</li> <li>- Understand that some materials can be recycled.</li> <li>- Harmful effects of pollution and how we can reduce pollution.</li> </ul> <p style="color: red;">Making paper out of old newspapers (blender, frame with chiffon to spread mix on)</p> <p><a href="#">KS1 Plastic Litter Pick Investigation Activity - Twinkl</a></p>	<p>Materials and magnets.</p> <ul style="list-style-type: none"> <li>- use correct vocabulary to describe different materials and their properties and sort materials into groups based on their properties.</li> <li>- Understand the difference between magnetic and non magnetic.</li> <li>- Recognise and name a variety of widely used materials. For example: wood, plastic, rock, paper, metal.</li> <li>- Explain why materials are chosen for specific tasks based on their properties.</li> <li>- Become aware that some materials are natural, and some are man-made</li> </ul>	<p>Human body – 5 senses.</p> <ul style="list-style-type: none"> <li>- Identify the 5 senses and associated body parts.</li> </ul> <p style="color: red;">Blindfold taste and smell tests. Feely bags.</p> <p><a href="#">Five Senses Experiment   Easy Kids Science</a></p> <p><a href="#">The Senses: Key Stage 1 Science Investigation by Helen Bennett on Prezi</a></p>	<p>Looking after living things, plants and growth</p> <p>Plants</p> <ul style="list-style-type: none"> <li>- What plants need to grow</li> <li>- Basic parts of plants</li> <li>- Plants make their own food</li> <li>- Deciduous and evergreen</li> <li>- Crops and farming</li> </ul> <p style="color: red;">Test plant growth – in cupboard (dark), no soil, no water. Opportunity to teach controls and only changing one variable.</p> <p><a href="#">Lesson: What plants need to grow and stay healthy   KS1 Science   Oak National Academy</a></p>

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		<p>Weather station – measure temperature, rainfall, wind direction for a week (Equipment in Spinny)</p>	<p>Challenge school to save even more energy one week – track here.</p> <p><a href="#">Adult dashboard for Nelson Academy   Energy Sparks</a></p>	<p>Use real materials to group and sort rather than pictures – photograph</p> <p>Magnetism hunt</p> <p>Test properties of materials to see suitability for a certain task.</p> <p>Is it waterproof? <a href="#">Lesson: Waterproof materials: plan and do   KS1 Science   Oak National Academy</a></p> <p>It is transparent? <a href="#">Lesson: Transparent and opaque materials: plan and do   KS1 Science   Oak National Academy</a></p> <p>Materials strength test <a href="#">Experiment on Strength of Materials</a></p>		
Year 2	<p>Forces – friction, air resistance, water resistance.</p> <p>Different ramp surfaces (in science cupboard)</p>	<p>Forces – friction, air resistance, water resistance.</p>	<p>Introduction to Astronomy</p> <ul style="list-style-type: none"> <li>- movement of the Earth and other planets relative to the sun</li> </ul>	<p>The Earth</p> <ul style="list-style-type: none"> <li>-The shape of the Earth, the horizon</li> <li>-Oceans and continents</li> <li>-North Pole and South Pole, Equator</li> </ul>	<p>Living things and their environment.</p> <ul style="list-style-type: none"> <li>- Living things live in environments to which they</li> </ul>	<p>Living things and their environment.</p> <ul style="list-style-type: none"> <li>- Living things live in environments to which they are particularly suited.</li> </ul>

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	<p>Different size parachutes Test float and sink</p>		<ul style="list-style-type: none"> <li>- describe the movement of the moon relative to the Earth (Planets, sun, moon)</li> </ul> <p>Human demonstrations and make models of rotate and revolve Make model with motor (link with Y5 who are making circuits this half term)</p>	<p>-Inside the Earth Layers: crust, mantle, core High temperatures</p> <p>Look at horizon – can they see a curve? Pictures from space – evidence the earth is round. 3d Model – layers of earth</p>	<p>are particularly suited.</p> <ul style="list-style-type: none"> <li>- Specific habitats and what lives there</li> </ul> <p><a href="#">activities-and-games-animals-habitats.pdf</a></p> <p>Look at habitats around school – pond, tree, under a log. Quadrants – how many different living things in a set space</p> <p>Habitat diorama of different habitats – include elements like plants, animals and water sources</p> <p>Link with geography <u>Fieldwork: Investigating habitats in our school grounds - Geographical Association</u></p>	<ul style="list-style-type: none"> <li>- Specific habitats and what lives there</li> <li>- The food chain</li> <li>- Focus on ocean habitat</li> <li>- Environmental change and habitat destruction</li> </ul> <p>Map a food chain in our school grounds</p> <p>Prey/predators <a href="#">Pellet Pack and FSC Guide Bundle - The Barn Owl Trust</a> (if not done in Y1)</p>
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<p>Year 3</p>	<p><b>Magnetism</b></p> <ul style="list-style-type: none"> <li>- Invisible forces</li> <li>- Magnetic poles</li> <li>- Magnetic field</li> <li>- Law of magnetic attraction.</li> </ul> <p style="color: red;">Magnet testing – what is magnetic. Can they spot a pattern? Are all metals magnetic? Test different strengths of magnet.</p>	<p><b>Simple machines – Levers and pulleys</b></p> <ul style="list-style-type: none"> <li>- How specific tools are made to perform specific jobs</li> <li>- How simple machines help make work easier, and how they are applied and combined in familiar tools and machines</li> <li>- e.g pulleys and levers, axels and wheels</li> </ul> <p style="color: red;">Machine hunt in school. Examples in their lives of each type of machine (with photos) See science cupboard for equipment – hands on testing and use of machines. How much weight can the pully lift etc.</p> <p style="color: blue;"><a href="#">Teach About Simple Machines   Science Buddies Blog</a></p>	<p><b>Cycles of Nature</b></p> <p><b>Water cycle</b></p> <ul style="list-style-type: none"> <li>- Most of the Earth’s surface is covered by water</li> <li>- The water cycle</li> </ul> <p><b>Seasonal cycles</b></p> <ul style="list-style-type: none"> <li>- Spring: sprouting, sap flow in plants, mating and hatching</li> <li>- Summer: growth</li> <li>- Fall: ripening, migration</li> <li>- Winter: plant dormancy, animal hibernation</li> </ul> <p style="color: red;">Water cycle in a zip lock bag. (Draw the</p>	<p><b>Life cycles</b></p> <ul style="list-style-type: none"> <li>- birth, growth, reproduction, death</li> <li>- Reproduction in plants and animals</li> </ul> <p>Life cycle of an insect</p> <p style="color: red;">Frog spawn from the pond? Hatch insect from larvae Butterfly hatching kit</p>	<p><b>Insects</b></p> <ul style="list-style-type: none"> <li>- Helpful and harmful insects</li> <li>- Distinguishing characteristics</li> <li>- Social insects</li> </ul> <p style="color: red;">Visit from bee keeper. Insects in acrylic to identify animal parts (in Spinney). Insect hunt in school grounds – observe using magnifying glasses.</p>	
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			<p>water cycle on the bag with sharpie)  <a href="#">How to Make a Water Cycle in a Bag   STEAM Activity for Kids</a></p> <p>Prove evaporation – measured amount of water in a cup, put on radiator/heat (or in sun/shade)            Measure after.  <a href="#">Evaporation-and-codensation-Experiments.pdf</a></p> <p>Grow bean sprouts/cress/bulbs to observe sprouting</p>			
Year 4	<p>Animal classification</p> <ul style="list-style-type: none"> <li>- Scientists classify animals according to the characteristics they share</li> <li>- Cold and warm blooded</li> <li>- Vertebrate and invertebrate</li> </ul>	<p>Ecology</p> <ul style="list-style-type: none"> <li>- Habitats, interdependence of organisms and their environment</li> <li>- The concept of a 'balance of nature' (constantly</li> </ul>	<p>Astronomy</p> <ul style="list-style-type: none"> <li>- Spherical bodies</li> <li>- Day and night</li> <li>- Length of days</li> <li>- Phases of moon</li> <li>- Seasons</li> </ul> <p>NB ensure they understand shadow</p>	<p>Human body – Muscles, Skeletal system, nervous system</p> <ul style="list-style-type: none"> <li>- Parts and function of skeleton</li> <li>- Musculo-skeletal connection</li> <li>- Brain sends messages around the body using nerves</li> </ul>	<p>Light Optics and Sound</p> <p>Light</p> <ul style="list-style-type: none"> <li>- Light travels in straight lines (demonstrated by shadows)</li> <li>- Transparent and opaque</li> <li>- Reflection</li> </ul>	


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	<ul style="list-style-type: none"> <li>- Examples and characteristics of each class</li> </ul> <p style="color: red;">Fish bones vs crab shell Animal skeletons</p>	<p>changing, not a static condition)</p> <ul style="list-style-type: none"> <li>- Man-made threats to the environment</li> </ul> <p>Air pollution: emissions, smog Water pollution: industrial waste, run-off from farming</p> <ul style="list-style-type: none"> <li>- Measures we can take to protect the environment (for example, conservation, recycling). (Link to English)</li> </ul> <p style="color: red;">Air pollution testing</p> <p><a href="#">07-Swab-Sample-Lesson-Plan-V1.0.pdf</a></p> <p style="color: red;">Water testing – from the pond.</p> <p><a href="#">Share it! Science : Science Teacher's Toolbox: Testing Water Quality</a></p>	<p style="color: red;">now you have moved light, optics and sound to Summer 1).</p> <p style="color: red;">Spherical earth – disappearing ship model</p> <p><a href="#">BBC Two - Science Clips Investigates, Earth, Sun and Moon, How do we know the Earth is spherical?</a></p> <p style="color: red;">Model to explain day and night</p> <p><a href="#">Day, night and seasons - Space physics: Video playlist - BBC Bitesize</a></p>	<ul style="list-style-type: none"> <li>- Cerebellum and medulla.</li> </ul> <p>Digestive system</p> <ul style="list-style-type: none"> <li>- body parts and functions involved in taking in food and getting rid of waste.</li> <li>- Salivary glands, taste buds</li> <li>- Teeth: incisors, canines, premolars and molars</li> <li>- Oesophagus, stomach, liver, small intestine, large intestine</li> <li>- Healthy diet and food pyramid</li> </ul> <p style="color: red;">Digestive system in a pair of tights <a href="#">  STEM</a></p> <p style="color: red;">Teacher lab – teeth (cross curricular with art) <a href="#">West Norfolk Teacher Lab - teaching-primary-science-through-creativity- -all-years.pptx</a></p>	<ul style="list-style-type: none"> <li>- Mirrors: plane, concave, convex</li> <li>- The spectrum</li> <li>- Parts of eye</li> </ul> <p>Sound</p> <ul style="list-style-type: none"> <li>- Sound as vibration</li> <li>- How sound travels</li> <li>- Qualities of sound including pitch</li> <li>- How the human ear works</li> </ul> <p style="color: red;">Hamilton is great for this...sign up for free</p> <p style="color: red;">Light – use mirrors, lenses, prism to split light. Test how transparent things are. <a href="#">Theatre Lighting Technicians   Hamilton Brookes</a></p> <p style="color: red;">Sound – Demonstrate sound waves – rice on drum, observe vibration of strings.</p>	
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					<p>Investigate boomwhackers/ recorders/ long and short strings on a guitar – what affects pitch?</p> <p><a href="#">Year 4 Science: Sound - Listen Up!   Hamilton Brookes</a></p> <p>Test how far sound travels</p>	
Year 5	<p>Rocks and soils</p> <ul style="list-style-type: none"> <li>- Formation and characteristics of metamorphic, igneous, and sedimentary rock</li> <li>- The formation of soil: topsoil, subsoil, bedrock</li> </ul> <p>Rock testing (float/sink, hardness, permeability) Sorting rocks Wormery</p>	<p>Solutions and changing states of matter (including reversible changes)</p> <ul style="list-style-type: none"> <li>- Solids, liquids and gasses and how states can be changed.</li> <li>- Solvent and solute</li> <li>- The dissolved substance is present in the solution even though you cannot see it.</li> </ul>	<p>Electricity</p> <ul style="list-style-type: none"> <li>- Electricity as the charge of electrons</li> <li>- Static electricity</li> <li>- Basic parts of simple electric circuits</li> <li>- Conductors and insulators materials</li> <li>- Safety rules for electricity</li> </ul>	<p>Human body: Circulatory system</p> <ul style="list-style-type: none"> <li>- Parts and function of heart</li> <li>- Different types of blood cells and their functions.</li> </ul> <p>Heart dissection (Lamb and Ox)</p> <p>Model blood if time</p> <p>Heart rate investigation</p> <p><a href="#">Y6plan Heartrate pose 2020 (1).docx</a></p>	<p>Human body: respiratory system</p> <ul style="list-style-type: none"> <li>- Process of taking in oxygen and getting rid of carbon dioxide</li> <li>- Parts of respiratory system</li> <li>- Dangers of smoking</li> </ul> <p>Lung dissection (order a pluck)</p>	<p>Evolution of plants and animals</p> <ul style="list-style-type: none"> <li>- Variation in offspring</li> <li>- Environmental adaptation</li> <li>- Adaptation may lead to evolution</li> <li>- Darwin</li> </ul> <p>Cast fossils (plaster of Paris)</p> <p><a href="#">Step by Step Guide on How to make Cast Fossils with Kids</a></p>

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	<p><a href="#">The Rock Cycle With Starburst Candy - YouTube</a></p>	<ul style="list-style-type: none"> <li>- Concentration and saturation</li> </ul> <p>Dissolution investigations – what dissolves, how to make something dissolve faster (stir, heat, size of particles eg sugar lump vs cube)            Show evaporation to leave salt behind in a mixture.            Separating mixtures – sieving, evaporating</p>	<p>Hands on build circuits</p> <p>Conductor/ insulator testing</p> <p><a href="#">Unit: Simple electrical circuits   KS2 Science   Oak National Academy</a></p>		<p>Model lungs (bottle and balloon)</p> <p><a href="#">Build a lung</a></p>	<p>Bird beak investigation</p> <p><a href="#">Build a lung</a></p>
Year 6	<p>Plant structures and processes</p> <ul style="list-style-type: none"> <li>- Parts and structure of vascular and non-vascular plants</li> <li>- Photosynthesis</li> <li>- Reproduction in plants</li> </ul> <p>Dissection of flower – tulip or daffodil are ideal</p>		<p>Classifying living things</p> <ul style="list-style-type: none"> <li>- Kingdom</li> <li>- Phylum</li> <li>- Class</li> <li>- Order</li> <li>- Family</li> <li>- Genus</li> <li>- Species</li> </ul> <p><a href="#">Year 6 Science: Living Things and Their Habitats - Classification Connoisseurs   Hamilton Brookes</a></p>		<p>Human Body: Hormones and reproduction</p> <ul style="list-style-type: none"> <li>- Endocrine system and the role in puberty including thyroid, pituitary, pancreas, adrenal glands.</li> </ul> <p>Hormones and receptors game</p>	<p>Human body: Life cycles and reproduction</p> <ul style="list-style-type: none"> <li>- Male and female reproductive organs. reproduction: intercourse, fertilisation, zygote, implantation of zygote in the uterus, pregnancy, embryo, foetus, newborn</li> </ul>

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	<p> <a href="#">Tulip Flower Dissection</a>  <a href="#">Daffodil Flower Dissection</a> </p> <p>                     Transportation in plants – use celery/ carnations. Note: ink from a blue felt tip pen in works best – soak the inner in water to extract ink                 </p> <p> <a href="#">60025-biology-report-transport-of-water-in-plants--anna.pdf</a> </p>		<p> <a href="#">Classification Exploration   Natural History Museum</a> </p>		<p> <a href="#">Endocrine Excitement! - Activity - TeachEngineering</a> </p>	<p>                     Model birth (child friendly – try this)                 </p> <p> <a href="#">Use a Balloon and Ping Pong Ball to Show How the Cervix Thins (Effacement) and Dilates During Labor</a> </p>
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- By the end of Key Stage 1, pupils will:	- By the end of Key Stage 2, pupils will:
<p>Ask simple questions and recognise that they can be answered in different ways</p> <p>Observe closely, using simple equipment</p> <p>Perform simple tests</p> <p>Identify and classify</p> <p>Use observations and ideas to suggest answers to questions</p> <p>Gather and record data to help answer questions</p> <p>know how plants grow and what they need to survive. (Y1)</p> <p>Know about common plants and trees, their structure and the differences between them. (Y1)</p> <p>Know about the four seasons, the associated weather and the varying day lengths throughout the year. (Y1)</p> <p>Know the basic needs of animals and how their young are similar to their parents (Y1)</p> <p>Know about a variety of common animals and their structure: carnivores, herbivores and omnivores. (Y1)</p> <p>Know about our 5 senses and how we use them. (Y1)</p> <p>Know the different materials we use and their properties. (Y1)</p> <p>Know how surfaces affect the movement of objects (y2)</p> <p>Know what a habitat is and how it is suited to a specific animal. (Y2)</p> <p>Know how animals obtain their food and what a food chain is. (Y2)</p> <p>Know about the diversity of ocean life and what threatens our oceans. (Y2)</p> <p>Know how environmental change can pose dangers to habitats. (Y2)</p> <p>Identify basic parts of our body systems and know and the importance of a healthy lifestyle. (Y2)</p> <p>Describe and classify objects according to what they are made of, and according to their physical properties (Y2)</p> <p>Know that the sun is a star and a source of energy, light and heat (Y2)</p> <p>Know that the earth revolves around the sun and that it rotates. (Y2)</p> <p>Know that when it is day where you are, it is night for people on the opposite side of the Earth. (y2)</p> <p>Know the layers of the Earth and</p>	<p>Ask relevant questions and use different types of scientific enquiries to answer them.</p> <p>Be able to set up simple practical enquiries, comparative and fair tests.</p> <p>Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment.</p> <p>Gather, record, classify and present data in a variety of ways to help in answering questions.</p> <p>Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.</p> <p>Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.</p> <p>Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.</p> <p>Identify differences, similarities or changes related to simple scientific ideas and processes.</p> <p>Use straightforward scientific evidence to answer questions or to support their findings.</p> <p>Know the life processes that happen each season (Y3)</p> <p>Know the life cycle and how plants and animals reproduce. (Y3)</p> <p>Know the Earth's surface is mostly covered by water and what the water cycle is. (Y3)</p> <p>Know the physical characteristics and life cycle of insects and how they can be both helpful and harmful. (Y3)</p> <p>Know how magnets can attract and repel depending on each pole. (Y3)</p> <p>Know how machines help make work easier, and how they are applied and combined in familiar tools (y3)</p> <p>Know how living things are grouped through classification and how environmental changes effect living things. (Y4)</p> <p>Know the role of producers, consumers and decomposers in the food chain (y4)</p> <p>Know the functions of our skeleton and muscles (y4)</p> <p>Understand how our digestive system works, the functions of our teeth and the food chain process. (Y4)</p> <p>Know the importance of nutrients from a varied and balanced diet. (Y4)</p> <p>Know that light is reflected from surfaces and this is needed in order for us to see. (Y4)</p> <p>Know how to protect our eyes. (Y4)</p> <p>Know how shadows are formed. (Y4)</p> <p>Understand how we hear sound and the difference between volume and pitch. (Y4)</p> <p>Understand the shape and movement of the planets in the solar system. (Y4)</p> <p>Know the main parts of the human circulatory system and their functions. (Y5)</p> <p>Understand the impact lifestyle can have on our bodies. (Y5)</p> <p>Understand how fossils are formed. (Y5)</p>

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	<p>Know the formation and characteristics of different kinds of rocks (Y5)</p> <p>Know how to group different kinds of rocks based on their properties. (Y5)</p> <p>Know how mountains are formed and that movement of the tectonic plates can result in natural disasters (Y5)</p> <p>Know how to construct a simple circuit and which materials are conductors/ insulators. (Y5)</p> <p>Understand that the number and voltage of cells used in a circuit impact the lamp/buzzer. (Y5)</p> <p>Know that everything is made of matter and made up of parts too small for us to see. (Y5)</p> <p>Know the names and common examples of 3 states of matter. (Y5)</p> <p>Know how to group materials into solids, liquids and gases and how their states can be changed. (Y5)</p> <p>Know how to separate mixtures and which changes of state are reversible. (Y5)</p> <p>Understand how living things have adapted to their environment thus resulting in evolution. (Y5)</p> <p>Understand that offspring inherit characteristics but are not identical to their parents. (Y5)</p> <p>Understand the functions of the different parts plants and the life cycle of plants through pollination. (Y6)</p> <p>Understand reproduction and the differences in life cycles. (Y6)</p> <p>Understand the effects of aging on our bodies. (Y6)</p>
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