



Curriculum Planning

Intent

- Our Science curriculum has been carefully planned and designed to encompass the content of the National Curriculum and the North Yorkshire Scheme of Learning (NySoL).
- Pupils' science education begins in the early years and builds year on year, developing pupils' expertise.
- Curriculum plans have been constructed effectively in line with the NySoL Scheme to ensure that pupils know more, remember more and are able to do more.
- Key knowledge has been mapped out from the early years to the end of KS2 to ensure that the curriculum is coherently sequenced and there is clear progression.
- The organisation of the curriculum builds both knowledge and skills of enquiry so that pupils can draw on it in future learning.
- Each of the 5 types of enquiry (Research, Comparative and Fair Tests, Pattern Seeking, Grouping and Classifying, Observing Over Time) is taught at least once every term.
- Working scientifically skills are embedded into every lesson to ensure these skills are being developed throughout the curriculum.
- Vocabulary has been identified and outlined clearly so that this can be taught explicitly within lessons.
- Clearly defined end points have been identified to ensure that pupils build upon prior learning and develop their knowledge of key concepts.
- Pupils commit knowledge to their long-term memory through recalling and repeated practice outlined in plans.

Implementation

Within and beyond our classrooms we provide a range of opportunities and implement a range of teaching methods to ensure that over the course of study, teaching is designed to help learners to remember in the long term the content they have been taught and to integrate new knowledge into larger concepts.

- Knowledge organisers which outline knowledge (including vocabulary) all children must master and apply in lessons are introduced at the start and referred to throughout a unit of study.
- A well sequenced cycle of lessons carefully plans for progression and depth concentrating on the scientific knowledge and skills suited to the age group.
- Lessons follow a consistent structure of retrieval, explanation, application and assessment which may include such features as questioning, modelling, individual, partner, group or whole class activities.
- Regular practical experiments are carried out focusing on scientific enquiry
- Enrichment activities, including visits and visitors to school
- Working walls reflect what is being taught, vocabulary, relevant diagrams, photos and display the 5 types of science enquiry characters
- Our inclusive approach is demonstrated through the way in which tasks and activities are adapted to ensure that all pupils are able to access the curriculum.
- Through retrieval, teachers make sure that pupils can draw on what they already know so that they can remember more.
- Key vocabulary is explicitly taught to enable pupils to develop their range of geographical vocabulary and understanding.
- Assessment for learning strategies are used at the start, during and at the end of lessons to assess pupils' learning and identify any gaps or misconceptions.

Impact

- Our Science Curriculum is high quality, well thought out and is planned to demonstrate progression. If children are keeping up with the curriculum, they are deemed to be making good or better progress. In addition, we measure the impact of our curriculum through the following methods:
 - Pre and post unit assessments
 - Assessment against end of year expectations detailed on Pupil Progress Records with clearly identified end points. These are then passed to the receiving teacher to ensure any gaps can be addressed when a key concept is revisited.



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Progression of Working Scientifically vocabulary					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
What...? How? Why ...? Similar different best and worst Change Plan look biggest and smallest compare sort group	observe change slowly quickly Describe name identify label record measure bigger and smaller pattern notice cycle predict	gradually identify observe Recognise investigate record units table fair evidence research Length observations prediction	similarities differences research and source scientists discovery process cycle Measurements conclude evaluate rank plan vary keep the same/constant bar graph table tally	classify interpret pattern relationship prediction analyse interpret conclude evaluate rank variable constants control repeat key relationship line graph	hypothesis variable constants evaluate plan conclude interpret classify categorise database enquiry control repeat support refute degree of trust scatter graph



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KS1 Medium Term Plans	Autumn Term		Spring Term			Summer Term	
Prior Knowledge (Retrieval)	Year 2 Pupils should be taught to: identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for uses. find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.		Year 1 Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	KS1/Year 3 First time the topic has been taught in school		Year 3 identify that animal, 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 * *identify that humans and some other animals have skeletons and muscles for support, protection and movement	Year 2 identify and name a variety of plants and animals in their habitats, including micro-habitats
Working Scientifically (Skills to be taught throughout the year)	PLAN		DO			REVIEW	
	Ask relevant questions and use different types of scientific enquiries to answer them.	Set up simple practical enquiries, comparative or fair tests Decide what observations and measurements to make and what equipment to use.	Use a range of equipment (including thermometers and dataloggers). Make systematic and careful observations and take accurate measurements using standard units. Use information sources provided to find things out	Gather, record and classify data in a variety of ways to help answer questions. Record findings using simple scientific language, tables, drawings and labelled diagrams.	Present data in a variety of ways using e.g., Venn diagrams, bar charts, simple scatter graphs and keys.	Use results to draw simple conclusions and make predictions for new values. Communicate what has been found out using straightforward scientific ideas and report findings using oral and written explanations and displays.	Suggest improvements to the way an enquiry is carried out. Suggest further questions to investigate.
Y4	Knowledge and Skills to be developed:		Knowledge and Skills to be developed:			Knowledge and Skills to be developed:	
	States of Matter L1 - understanding what solid, liquid and gas is. L2 - <u>Classifying and grouping</u> Compare and group materials together according to whether they are solid, liquid or gas L3 - <u>Fair testing</u> observe that some materials change state when they are heated or cooled		Sound L1 – <u>Classify and grouping</u> identify different sounds and know they come through vibration. L2 - <u>Research</u> Know that sounds and vibrations travel from	Electricity L1- <u>Classify and grouping</u> Identify common appliances that run on electricity L2 - <u>Classifying and grouping</u> construct a simple series circuit naming and identifying its basic parts		Animals including Humans L1 – <u>Classifying and grouping</u> identify the different types of teeth in humans and their functions L2 - <u>Research</u> Identify and compare teeth in animals.	Living things and their Habitat L1- <u>Classifying and grouping</u> Know that living things can be groups in a variety of ways L2 use a classification key to sort things



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	<p>L4 - <u>Fair testing</u> measure/research the temperature at which a material melt</p> <p>L5 - <u>Observing over time</u> measure/research the temperature at which a material solidifies</p> <p>L6 - <u>Pattern seeking</u> Identify the part played by evaporation in the water cycle. Investigation to see which sock dries the best.</p> <p>L7 - <u>Observing over time</u> Identify the part played by condensation in the water cycle.</p> <p>L8 - <u>Research</u> Identify the part played by precipitation in the water cycle.</p> <p>L9 Consolidation of the water cycle.</p>	<p>a medium to the ear to the brain</p> <p>L3 - <u>Pattern seeking</u> Investigate the pitch of sound and what changes it</p> <p>L4 - <u>Pattern seeking</u> Carry out and conclude an investigation which involves pitch</p> <p>L5 - <u>Research</u> There is a link between the volume of the sound and the strength of the vibrations that produced it.</p> <p>L6 - <u>Pattern seeking</u> sound gets fainter as the distance from the sound source increases.</p> <p>L7 - <u>Observing over time</u> When is our classroom the quietest?</p>	<p>L3 - <u>Research</u> Identify whether a lamp will light by investigating circuits.</p> <p>L4 - <u>Comparative and Fair test</u> plan an investigation to recognise common conductors and insulators.</p> <p>L5 conclusion from investigations</p> <p>L6 - <u>Classifying and grouping</u> recognise that a switch can open and close a circuit</p>	<p>L3 - <u>Pattern-seeking</u> classify living things as producers, predators and prey. Focus on food chains. What would happen if one part of the food chain was taken away/ over-populated.</p> <p>L4 - <u>Observing over time</u> Identify and record what an owl hunts and eats</p> <p>L5 Describe the basic function of the digestive system in humans. – creating the digestive system</p> <p>L6 - <u>Classify and grouping</u> Order the stages of digestion describing the simple function of each part.</p>	<p>L3 Create a classification tree</p> <p>L4 - <u>Research</u> know that environments change and that this can expose a threat to habitats.</p> <p>L5 consolidation. Creating a leaflet to present information</p>
Future Learning	<p>Year 5 compare and group together everyday materials based on evidence from comparative and fair tests, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.</p> <p>understand 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 comparative and fair tests, for the particular uses</p>	<p>KS3 During the remainder of Key Stage 2 the children are not expected to revisit or extend their knowledge of Sound. Waves Key Stage 3 Observed waves Waves on water as undulations which travel through water with transverse motion; these waves can be reflected and add or cancel – superposition. Sound waves frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound</p>	<p>Year 6 associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <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> <p>use recognised symbols when representing a simple circuit in a diagram.</p>	<p>Year 5 describe the changes as humans develop to old age</p>	<p>Year 5 describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird</p> <p>describe the life process of reproduction in some plants and animals.</p>



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		of everyday materials, including metals, wood 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 that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	sound needs a medium to travel, the speed of sound in air, in water, in solids sound produced by vibrations of objects, in loudspeakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal auditory range of humans and animals.			
Vocabulary	All	Solid, liquid, gas, melting, freezing, temperature,	Vibrate, travel, quiet, high, low loud	Electricity, circuit, battery, wire, bulb	Teeth, mouth, stomach, throat, small intestines, large intestines, canine	Habitat, environment, classification keys, classification tree, classification, migration, hibernate
	Most	State change, melting point, Boiling point, evaporation, condensation, precipitation, acclimation, water cycle	Faint, insulation, volume, pitch	Mains, electrical appliance, electrical circuit, complete circuit, cell positive/negative, connection, switch, buzzer, conductor, motor, metal, non-metal	Digestive system, digestion, saliva, oesophagus, nutrients, incisor, molar, pre-molar, wisdom teeth Herbivore, omnivore, carnivore, producer, consumer, predator, prey, food chain	
	Some	Surface run off, Transpiration from plants	Source, medium	Component, series circuit	Primary consumer, secondary consumer, top consumer	
Quality Texts		Once Upon a Raindrop (Narrative) The water cycle – online text Children's encyclopaedia – G. Reading text	Sound waves – online text Children's encyclopaedia – G. Reading text	Children's encyclopaedia- G. Reading text	Journey through the digestive System – online text Children's encyclopaedia – G. Reading text	BBC – food chains Children's encyclopaedia - G. Reading
Enrichment Activities (e.g. visitors/visits)					Stepney Hill Farm	
National Curriculum		Compare and group materials together, according to whether they are solids, liquids or gases 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) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature	Identify how sounds are made, associating some of them with something vibrating Recognise that vibrations from sounds travel through a medium to the ear Find patterns between the pitch of a sound and features of the object that produced it	Identify common appliances that run on electricity Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers Identify whether a lamp will light in a simple series circuit, based on whether the	Describe the simple functions of the basic parts of the digestive system in humans Identify the different types of teeth in humans and their simple functions Construct and interpret a variety of food chains, identifying producers, predators and prey	Recognise that living things can be grouped in a variety of ways Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment Recognise that environments can change



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		<p>Find patterns between the volume of a sound and the strength of the vibrations that produced it</p> <p>Recognise that sounds get fainter as the distance from the sound source increases</p>	<p>lamp is part of a complete loop with a battery</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether a lamp lights in a simple series circuit</p> <p>*Recognise some common conductors and insulators, and associate metals with being good conductors</p>		<p>and that this can sometimes pose dangers to living things</p>
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