

VISION FOR: Science

The teaching of science at Kobi Nazrul will provide children with the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. We want children to be equipped with the scientific skills and knowledge required to understand the uses and implications of science, today and for the future. Children will develop understanding through different types of science enquiries that help them to answer scientific questions about the world around them.

PRINCIPLES AND RATIONALE

Through our Science curriculum children will develop the skills needed to carry out scientific investigations and to hypothesise; developing predictions based on their developing scientific knowledge. Our children will develop critical thinking skills through big questions, which will facilitate discussions around scientific concepts. The children at Kobi Nazrul will understand the impact of scientists and scientific discoveries on animals and the natural world in order to understand how science impacts on and affects everyday life. They will have many opportunities to make observations overtime and make links between our scientific learning and the wider world, beginning to understand the impact of human choices on the natural world and develop an understanding of what effect this has long-term on our world.

EYFS - CYCLES A AND B (Please see separate EYFS Subject overview for further detail)	What skills do we want children to develop across topics in the EYFS? (Birth to 5 Matters, Ranges 4,5,6):
<p>The world</p>	<ul style="list-style-type: none"> • Talk about and make observations of some of the things they have observed such as plants, animals, natural and found objects • To make comments and ask questions about aspects of their familiar world such as the place where they live or the natural world • Talk about why things happen and how things work • Begin to understand the effect their behaviour can have on the environment • Develop an understanding of growth, decay and changes over time • Know about similarities and differences in relation to places, objects, materials and living things • Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.



Early Years Foundation Stage	TERM 1	TERM 2	TERM 3
Cycle A	Edible garden project (Growing) Humans- All about Me Listening to sounds in the environment	Edible garden project (Growing) People who help us- visits from parent or community (gardener) Recycling – How, when, where Trip- Visit to the farm	Edible garden project (Growing) Love your world- Pollution/ littering Water experiments and exploring floating and sinking Life cycles- Butterflies Trip- Aquarium, River walk
Cycle B	Animals- woodland Cooking- Porridge, gingerbread Trip/Visit- Nite Owls, Soanes Centre	Garden project Staying healthy – routines: sleeping and eating Healthy eating- smoothy making Trip- Science Museum (Reception), Education group science workshop (Nursery)	Baking bread Life cycles- Chicks Growing and recycling



SCIENCE: OVERVIEW – YEARS 1-6

Year: One	Term 1	Term 2	Term 3
	<p>Everyday Materials</p> <p>Seasonal changes- <i>How do we know which season it is?</i></p> <p>1a</p> <p>Autumn art</p> <p>Sorting objects based on material</p> <p>Testing waterproof, testing bendy</p>	<p>Animals Including Humans</p> <p>1b</p> <p>Senses lesson - Kent</p>	<p>Plants</p> <p>Seasonal changes</p> <p>1c</p>
Relevant non-fiction titles	Trees and Other Plants	Happy Pet Friends series (dogs, rabbits, cats)	Trees and Other Plants
	<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, water and rock</p> <p>Describe the simple physical properties of a variety of everyday materials. compare</p> <p>Seasonal changes: Observe changes across the four seasons</p> <p>Observe and describe the weather associated with the seasons and how day length varies</p>	<p>Identify and name a variety of common animals that are birds, fish, amphibians, reptiles and mammals</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores- <i>Identity and belonging – how do we know what group an animal belongs to?</i></p> <p>Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)</p> <p>Identify, name draw and label the basic parts of the human body and say which parts of the body is associated with each sense</p> <p>Seasonal changes: Observe changes across the four seasons</p>	<p>Identify and describe the basic structure of a variety of common plants including roots, stem/trunk, leaves and flowers</p> <p>Identify and name a variety of common plants, including garden plants, wild plants and trees, and those classified as deciduous and evergreen</p> <p>Seasonal changes: Observe changes across the four seasons</p> <p>Observe and describe the weather associated with the seasons and how day length varies</p>
Observation Overtime	Seasonal change- Looking at different colours the leaves turn throughout the term.	Observe and describe the weather associated with the seasons and how day length varies	Observe growth of plant from seed to a plant



Investigations And links to wider world (Including what jobs it links to)	Engineers Builders	Doctor, vet, chef	Soanes centre – trip gardener
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Year: Two	Term 1	Term 2	Term 3	
	<p>Uses of everyday materials- power – which material will be most effective/ have the most lasting impact? 2a (1a) Big Question – What if everything was made of ...? (Glass, wood, metal etc.)</p>	<p>Animals Including Humans 2b (1b) Big Question – What is the difference between a want and a need?- Big Question- How do different animals change over time?</p>	<p>All Living Things and Their Habitats 2c Identity and belonging- How do living things survive?</p>	<p>Plants 2d (1c) Connections- why does a plant have different parts?</p>
Relevant non-fiction titles			In an Ocean- Sarah Ridley	
	<p>Identify and compare the uses of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching</p>	<p>Notice that animals, including humans, have offspring which grow into adults</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>Explore and compare the differences between things that are living, dead, and things that have never been alive</p> <p>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</p> <p>Identify and name a variety of plants and animals in their habitats, including micro-habitats Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify</p>	<p>Observe and describe how seeds and bulbs grow into mature plants</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p> <p>Observe and describe how seeds and bulbs grow into mature plants</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy</p>



				and name different sources of food.	
Observation Overtime	Find out about a scientist called John McAdams and how he invented tarmac. Look at what changes were made to roads and why.				
Investigations And links to wider world (Including what jobs it links to)	Investigation 1 - Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching Investigation 2 – Which material would be most suitable for Paddington’s new coat? Jobs – Scientists – Charles Macintosh		Sir David Attenborough Investigation? – observe minibeasts? E.g. wormery / ant farm	Soanes Centre - habitats	Grow your own salad
Year: Three	Term 1		Term 2	Term 3	
	Light 3a	Animals Including Humans 3b (1b, 2b)	Plants 3c (1c, 2d) Connections- What does a plant need to grow healthily?	Forces and Magnets 3d	Rocks 3e
Relevant non-fiction titles			Trees and Other Plants- Tracey Turner Bees and Other Bugs- Tracey Turner		The book of Bok- Neil Armstrong/ Grahame Baker Smith
	BQ: Would you have sunlight or moonlight?	P4C-Should animals be treated the same	Big Question- would rather have sunlight or	Compare how things move on different surfaces	Big Question: what lies beneath our feet?



	<p>connections Recognise that they need light in order to see things and that dark is the absence of light</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes Activity: write a letter to convince James why it is important to wear sunglasses.</p> <p>Make your own sun glasses</p> <p>Recognise that shadows are formed when the light from a light source is blocked by a solid object Find patterns in the way that the sizes of shadows change</p>	<p>as humans? – Equality and equity?</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> <p>Identify that humans and some animals have skeletons and muscles for support, protection and movement</p>	<p>soil for plants? - connections</p> <p>Identify and describe the functions of different parts of plants; roots, stem, leaves and flowers</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil and room to grow) and how they vary from plant to plant</p> <p>Investigate the ways in which water is transported within plants</p> <p>Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>	<p>How does a force change an object?</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 or 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 Predict whether two magnets will attract or repel each other, depending on which poles are facing</p>	<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>Observation Overtime</p>			<p>Observe changes to a plant overtime</p>		



Investigations and links to wider world (Including what jobs it links to)	Which materials reflect the most light?	Investigate the amount of sugar in different fizzy drinks	What do plants need to grow?	Which materials cause friction?	Collect rocks-playground/local area
	How do shadows change size?	Marie Curie Developing the use of x-rays to identify bones. Visitor – student doctors	Dissecting a plant Gardener	Which magnet is the strongest?	To investigate which rock would be better suited as a kitchen worktop Palaeologist Mary Anning

Year: Four	Term 1	Term 2		Term 3
	<p>Electricity 4a</p> <p>Would you rather have solar power or hydroelectric power?</p> <p>Identity and belonging/ Equity and equality- Who has access to electricity? Is this fair? What is the impact of this? How does the source of electricity change?</p>	<p>All living things and their habitats 4c (2c)</p>	<p>Sound 4d</p> <p>Legacy- Identify people who have/ are impacting on this area (e.g.- historic figures and modern- may link to hearing impairments)</p>	<p>States of matter 4e (1a, 2a)</p> <p>Change- what has caused the change? How are they similar? Different?</p>
Relevant non-fiction titles		A World full of Wildlife- Neal Layton Above below and Long ago- Michael Bright and Jonathan Emmerson		
	Identify common appliances that run on electricity	Recognise that living things can be grouped in a variety of ways	Identify how sounds are made, associating	Compare and group materials together, according to whether they are solids, liquids or gases



	<p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <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> <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> <p>Recognise some common conductors and insulators, and associate metals with being good conductors</p> <p>Year 6 objectives: 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>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things</p>	<p>some of them with something vibrating</p> <p>Recognise that vibrations from a sound travel through a medium to the ear</p> <p>Find patterns between the pitch of a sound and features of the object that produced it</p> <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>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 ($^{\circ}\text{C}$)</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>
<p>Observation Overtime</p>	<p>How does light travel in our classroom at different parts of the day?</p>	<p>Observe outside temperature and plot on a graph. Which was the coldest/warmest day of the month?</p>		



<p>Investigations And links to wider world (Including what jobs it links to</p>	<p>The Apprentice Electrician – chn receive a certificate at end of unit (link to real life electrician) Testing circuits: number of bulbs, cells etc.</p>		<p>Are animals better off in their natural habitat or in a zoo? Link to P4C</p>	<p>Making a speaker Link to drumming/singing</p>	<p>Melting chocolate – with Brian Cox Make links back to Autumn 1 for Charlie and the Chocolate Factory</p>
<p>YEAR: Five</p>	<p>TERM 1</p>		<p>TERM 2</p>		<p>TERM 3</p>
	<p>Earth and Space 5a Equity and equality- should space travel be available to all? Could be a possible English debate topic. What if the Earth ceased to rotate?</p>	<p>Properties and changes of materials 5b (1a, 2a, 4e) Equality and equity- How are resources distributed across the world? What impact does this have? (e.g.- sustainability- natural disasters/ oil crisis)</p>	<p>Animals including Humans- digestive system 5c (1b,2b,3b,-) <i>From 2022-2023 onwards this will be now taught in Year 5</i></p>	<p>All Living Things and Their Habitats 5d (2c, 4c) How can we show changes over time?</p>	<p>Forces 5e (3d) Legacy- Newton Link back to Space- lack of gravity- connections What makes a fair test? How can we identify when a test isn't fair? Equity and Equality</p>



Relevant non-fiction titles	Wonders of the Night Sky and The Future of the Universe – Professor Raman Prinja Exploring Space!- Tony Bradman		Food- Myth Busters- Helen Chapman		
	<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>Use the idea of the Earth’s rotation to explain day and night and the apparent movement of the Sun across the sky</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>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,</p>	<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>*Describe the changes as humans develop from birth to old age- please see note at the bottom of this document</p> <p>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>	<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>Identify the effects of air resistance, water resistance and friction, that 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>including through filtering, sieving and evaporating</p> <p>Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic</p> <p>Demonstrate that dissolving, mixing and changes in state are reversible changes</p> <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>			
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Observation Overtime	Observe what happens to milk & vinegar in different temperatures over a period of time in various containers.		Children measuring their own growth and make a height chart. How tall are you?		Growing pumpkin seeds
Investigations And links to wider world (Including what jobs it links to)	Astronauts Science museum Planetarium Greenwich	Separating Secondary school – y7 lesson in a lab.	Tell the story of food (using crackers) as it travels through the body – link to writing Egg shell experiment	Hackney City Farm – egg to chick Visitor in – animal expert/vet	Friction tests – trainers Air
YEAR: Six	TERM 1		TERM 2		TERM 3
	Animals including Humans 6a (1b, 2b, 3b, 5c) Unit 5c is no longer taught as a separate unit. Why could the heart be described as the most powerful organ?		Light 6b (3a, 4a) Who has influenced our understanding of light?	Living things and their habitats 6c (2c, 4c, 5d)	Evolution and inheritance 6d (1c, 2c, 2d, 4c, 5d)
Relevant non-fiction titles					I used to be a fish- Tom Sullivan The Ice Age- Andy Seed
	Identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Describe the ways in which nutrients and water are transported within animals, including humans		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	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 Give reasons for classifying plants and	Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution



		<p>from light sources to objects and then to our eyes</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</p>	<p>animals based on specific characteristics</p>	
Observation Overtime				
Investigations And links to wider world (Including what jobs it links to)	<p>Test your heart rate before and after physical exercise</p> <p>Diet – impact on teeth</p> <p>Link between calories, weight, exercise, lifestyle – measure something/track over time.</p>	<p>Make a periscope</p>	<p>Go and collect some plants and then classify them, according to their own criteria. Cross curricular link: maths – they need to think their own categories</p> <p>Visit a nature reserve</p> <p><u>Post Covid:</u> Take pictures of trees/plants around school and local area. Identify using online tool. Add to wow book and create a running guide of what we find out about each and how they differ/change.</p>	<p>Friction tests – trainers Air</p> <p>Research how different animals and plants have adapted to their environment</p> <p>City farm?</p>



Vocabulary	<p>Simple comparisons: dark, dull, bright, very bright</p> <p>Comparative vocabulary: brighter, duller, and darker</p> <p>Superlative vocabulary: brightest, dullest, and darkest</p> <p>Opaque, translucent, transparent</p> <p>Shadow – block, absence of light</p> <p>Reflect – bounce, mirror, reflection</p> <p>See – light source</p> <p>Sun – sunset, sunrise, position</p>	<p>Nutrition</p> <p>Diet</p> <p>Vitamins, minerals, fats, proteins and carbohydrates</p> <p>Functions of skeletons – protect, support and aid movement</p>	<p>Trees - deciduous, evergreen, ash, birch, beech, rowan, common lime, oak, sweet chestnut, horse chestnut, apple, willow, sycamore, fir, pine, holly, etc.</p> <p>Wild flowering plants – give children relevant names</p> <p>Garden plants – crocus, daffodil, bluebells, etc.</p> <p>Parts of plants – roots, branch, trunk, stalk, leaf, flower, petal, seeds, bulbs and twigs</p> <p>Parts of a flower – petal, stamen (anther + filament), carpel (stigma + style + ovary + ovule)</p> <p>Processes – pollination, fertilisation, germination</p>	<p>Magnets – bar and horseshoe</p> <p>Attract, repel</p> <p>North and south poles</p> <p>Magnetic</p> <p>Magnetic field</p>	<p>Names of rocks – Chalk, limestone, granite, basalt, sandstone, flint, slate, shale, marble</p> <p>Types of rock – Sedimentary, metamorphic, igneous</p> <p>Types of minerals – Calcite, feldspar, topaz, diamond, talc, corundum</p> <p>Properties of rocks – Hard/soft, permeable/impermeable</p> <p>Processes – Heat, pressure, erosion, transportation, deposition, melt, solidify</p> <p>Size of rocks – Grain, pebbles</p> <p>Rock describing words – Crystals, layers</p> <p>Early areas of land – Gondwana, Pangea</p>
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					Land formations – Plates, volcanoes, mountains, valleys
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Year: Four	Term 1	Term 2		Term 3
	<p>Electricity 4a</p> <p>Would you rather have solar power or hydroelectric power?</p> <p>Identity and belonging/ Equity and equality- Who has access to electricity? Is this fair? What is the impact of this? How does the source of electricity change?</p>	<p>All living things and their habitats 4c (2c)</p>	<p>Sound 4d</p> <p>Legacy- Identify people who have/ are impacting on this area (e.g.- historic figures and modern- may link to hearing impairments)</p>	<p>States of matter 4e (1a, 2a)</p> <p>Change- what has caused the change? How are they similar? Different?</p>
Relevant non-fiction titles		<p>A World full of Wildlife- Neal Layton Above below and Long ago- Michael Bright and Jonathan Emmerson</p>		
Objectives	<p>Identify common appliances that run on electricity</p> <p>Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers</p> <p>Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of complete loop with a battery</p> <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> <p>Recognise some common conductors and insulators, and associate metals with being good conductors</p>	<p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things</p>	<p>Identify how sounds are made, associating some of them with something vibrating</p> <p>Recognise that vibrations from a sound travel through a medium to the ear</p> <p>Find patterns between the pitch of a sound and features of the object that produced it</p> <p>Find patterns between the volume of a sound and the strength of the</p>	<p>Compare and group materials together, according to whether they are solids, liquids or gases</p> <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> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature</p>



	<p>Year 6 objectives: 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 circuiting a diagram</p>		<p>vibrations that produced it</p> <p>Recognise that sounds get fainter as the distance from the sound source increases</p>	
Observation Over time	How does light travel in our classroom at different parts of the day?	Observe outside temperature and plot on a graph. Which was the coldest/warmest day of the month?		Observe and record evaporation from a puddle/beaker.
Investigations And links to wider world (Including what jobs it links to)	<p>The Apprentice Electrician – chn receive a certificate at end of unit (link to real life electrician)</p> <p>Testing circuits: number of bulbs, cells etc.</p>	Are animals better off in their natural habitat or in a zoo? Link to P4C	<p>Making a speaker Link to drumming/singing</p>	<p>Melting chocolate – with Brian Cox</p> <p>Make links back to Autumn 1 for Charlie and the Chocolate Factory</p>
Vocabulary	Electricity, energy, resistance, volts	Habitat, micro habitat Pond, meadow, log pile, woodland, river, lake, beach, cliff	Ways to create sound – bang, blow, shake, and pluck	<p>States of matter - Solid, liquid and gas</p> <p>Examples of gases (at room temperature and pressure) – Oxygen, hydrogen, helium, carbon dioxide, methane</p>



	<p>Appliances: fridge, freezer, TV, computer, iron, kettle, etc.</p> <p>Series circuit</p> <p>Components: battery, bulb (lamp), bulb (lamp) holder, buzzer, crocodile clip, leads, wires, switch</p> <p>Describing words: brighter, duller, slow, fast, quiet, loud</p> <p>Conductor, insulator</p> <p>Effects of electricity: Light, sound, movement, heat</p> <p>Switches – open, close</p>		<p>Organism – plant, animal</p> <p>Trees - deciduous, evergreen, ash, birch, beech, rowan, common lime, oak, sweet chestnut, horse chestnut, apple, willow, sycamore, fir, pine, holly, etc.</p> <p>Wild flowering plants – choose as appropriate</p> <p>Garden plants – crocus, daffodil, bluebells, etc.</p> <p>Parts of plants – roots, branch, trunk, stalk, leaf, flower, petal, seeds, bulbs and twigs</p> <p>Invertebrates – snail, slug, woodlouse, spider, beetle, fly, etc.</p> <p>Pond animals – pond skater, water slater, snail, pond snail, leech, common frog, smooth newt, etc.</p>	<p>Loudness – quiet, quieter, quietest, loud, louder and loudest</p> <p>Pitch - low, lower, lowest, high, higher, and highest</p> <p>Vibrations</p> <p>Source</p>	<p>Examples of liquids (at room temperature and pressure) – Water, milk, juice, petrol, oil</p> <p>Examples of solids (at room temperature and pressure) – Wood, rocks, metal, plastic, glass, wool, leather, etc.</p> <p>Processes – Melting, condensation, evaporation, solidifying, freezing</p> <p>Water cycle</p> <p>Water vapour</p> <p>Steam</p> <p>Heating</p> <p>Cooling</p>
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Working Scientifically LKS2

During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings

YEAR: Five	TERM 1		TERM 2		TERM 3
	Earth and Space 5a Equity and equality- should space travel be available to all? Could be a possible English debate topic.	Properties and changes of materials 5b (1a, 2a, 4e) Equality and equity- How are resources	Animals including Humans- digestive system 5c (1b,2b,3b,-) <i>From 2022-2023 onwards this will be now taught in Year 5</i>	All Living Things and Their Habitats 5d (2c, 4c) How can we show changes over time?	Forces 5e (3d) Legacy- Newton Link back to Space- lack of gravity-connections



	What if the Earth ceased to rotate?	distributed across the world? What impact does this have? (e.g.- sustainability- natural disasters/ oil crisis)			What makes a fair test? How can we identify when a test isn't fair? Equity and Equality
Relevant non-fiction titles	Wonders of the Night Sky and The Future of the Universe – Professor Raman Prinja Exploring Space!- Tony Bradman		Food- Myth Busters- Helen Chapman		
Objectives	<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>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky</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>Understand that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution</p>	<p>Teeth-objective</p> <p>*Describe the changes as humans develop from birth to old age- please see note at the bottom of this document</p> <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,</p>	<p>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>	<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>Identify the effects of air resistance, water resistance and friction, that 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>



Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating

Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic

Demonstrate that dissolving, mixing and changes in 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

identifying producers, predators and prey.



		associated with burning and the action of acid on bicarbonate of soda			
Observation Over time	Observe what happens to milk & vinegar in different temperatures over a period of time in various containers.		Children measuring their own growth and make a height chart. How tall are you?		Growing pumpkin seeds
Investigations And links to wider world (Including what jobs it links to)	Astronauts Science museum Planetarium Greenwich	Separating Secondary school – y7 lesson in a lab.	Tell the story of food (using crackers) as it travels through the body – link to writing Egg shell experiment	Hackney City Farm – egg to chick Visitor in – animal expert/vet	Friction tests – trainers Air
Vocabulary	<p>Day and night - Earth, axis, rotate</p> <p>Solar system – Star = Sun, Planets = Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune (Pluto was classified as Dwarf planet in 2006)</p> <p>Phases of the Moon - full moon, gibbous moon, half moon, crescent moon, new moon, waxing ,waning</p> <p>Moon’s orbit: 29.5 days, lunar month</p> <p>Orbit, planets, revolve, sphere</p>	<p>Thermal conductivity – thermal conductor, thermal insulator</p> <p>Electrical conductivity – electrical conductor, electrical insulator</p> <p>Dissolving – Solvent, solution, solute, soluble, insoluble, solid, liquid, particles, suspensions</p> <p>Separating materials – Sieve,</p>	<p>Digestive system –, oesophagus, stomach, acid, small intestine</p> <p>Protein, vitamin, mineral, carbohydrate, fats, energy, growth, repair. Saliva</p> <p>Teeth – Incisors, canines, premolars, molars</p> <p>Function</p> <p>Foodchain – producer, consumer, predator, prey</p>	<p>Animals – amphibians, reptiles, birds, mammals, insects, fish</p> <p>Animal development – egg, larva, pupa, nymph, adult, metamorphosis</p> <p>Parts of a flower – petal, stamen (anther + filament), carpel (stigma + style + ovary + ovule)</p> <p>Processes – pollination, fertilisation, germination Gestation</p>	<p>Types of forces: gravity, friction, air resistance, upthrust, weight</p> <p>Measuring forces: Newton meter, Newtons (N)</p> <p>Particles</p> <p>Surface area</p> <p>Push, pull</p> <p>Balance</p> <p>Mass – grams and kilograms</p> <p>Mechanical devices – gears, levers, pulleys, springs</p>



		filter, evaporate, condense		<p>Foetus Puberty Hormones Pituitary gland Testosterone Oestrogen – These words are taught through SRE</p> <p>Species Baby Toddler Adolescent Adult Elderly person</p>	
YEAR: Six	TERM 1		TERM 2		TERM 3
	<p>Animals including Humans 6a (1b, 2b, 3b, 5c) Unit 5c is no longer taught as a separate unit. Why could the heart be described as the most powerful organ?</p>		<p>Light 6b (3a, 4a) Who has influenced our understanding of light?</p>	<p>Living things and their habitats 6c (2c, 4c, 5d)</p>	<p>Evolution and inheritance 6d (1c, 2c, 2d, 4c, 5d)</p>
Relevant non-fiction titles					<p>I used to be a fish- Tom Sullivan The Ice Age- Andy Seed</p>
Objectives	<p>Identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans</p>		<p>Recognise that light appears to travel in straight lines</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>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>	<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> <p>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents</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> <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>	<p>Give reasons for classifying plants and animals based on specific characteristics</p>	<p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p>	
Observation Over time					
Investigations And links to wider world (Including what jobs it links to)	<p>Test your heart rate before and after physical exercise</p> <p>Diet – impact on teeth</p> <p>Link between calories, weight, exercise, lifestyle – measure something/track over time.</p>	<p>Make a periscope</p>	<p>Go and collect some plants and then classify them, according to their own criteria. Cross curricular link: maths – they need to think their own categories</p> <p>Visit a nature reserve</p> <p><u>Post Covid:</u> Take pictures of trees/plants around school and local area. Identify using online tool. Add to wow book and create a running</p>	<p>Research how different animals and plants have adapted to their environment</p> <p>City farm?</p>	<p>Friction tests – trainers</p> <p>Air</p>



			guide of what we find out about each and how they differ/change.		
Vocabulary	<p>Circulatory system – heart, blood, veins, arteries, pulse, clotting</p> <p>Diet – balanced, vitamins, minerals, proteins, carbohydrates, sugars, fats</p> <p>Drugs – caffeine, nicotine, alcohol, cannabis, cocaine, heroine</p> <p>Lifestyle – healthy</p>	<p>Simple comparisons: dark, dull, bright, very bright</p> <p>Comparative vocabulary: brighter, duller, and darker</p> <p>Superlative vocabulary: brightest, dullest, and darkest</p> <p>Opaque, translucent, transparent</p> <p>Shadow – block, absence of light</p> <p>Reflect – bounce, mirror, reflection</p> <p>See – light source</p> <p>Sun – sunset, sunrise, position</p> <p>Light source</p> <p>Travel</p> <p>Straight lines</p>	<p>Classification</p> <p>Vertebrate, invertebrate</p> <p>Kingdoms: animal, plant, ‘micro-organism’</p> <p>Classes: amphibian, reptile, bird, mammal,</p> <p>Scales, feathers</p> <p>Flowering plant, non-flowering plant</p>	<p>Evolution, evolve</p> <p>Natural selection</p> <p>Survival</p> <p>Reproduction</p> <p>Offspring, parents, siblings</p> <p>Environment</p> <p>Variation</p> <p>Fossils; ammonites, belemnites, micrasters, etc.</p>	<p>Types of forces: gravity, friction, air resistance, upthrust, weight</p> <p>Measuring forces: Newton meter, Newtons (N)</p> <p>Particles</p> <p>Surface area</p> <p>Push, pull</p> <p>Balance</p> <p>Mass – grams and kilograms</p> <p>Mechanical devices – gears, levers, pulleys, springs</p>



Working Scientifically UKS2

During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations
- identifying scientific evidence that has been used to support or refute ideas or arguments

Vocabulary to be used across all units and all year groups:

Sort, classify, scientist, record, data, investigate, process, investigation, plan, question, equipment, prediction, conclusion Compare, observe, fair test, variable, method, predict, reliable, repeat, average, result, conclusion, explain

Useful websites/ resources to support planning

Kent scheme of work (follows NC closely but parts are not relevant/ appropriate to our school context) Several investigations/ lessons per objective. Often includes link to a relevant scientist/inventor

www.twinkl.co.uk- some good investigations and links to other websites but no 'real life' images

Useful websites for children:

<http://www.bbc.co.uk/science>

<http://www.bbc.co.uk/bitesize/ks2/science/>



- http://www.bbc.co.uk/bitesize/ks2/science/living_things/
- <http://www.bbc.co.uk/bitesize/ks2/science/materials/>
- Animals including Humans · http://www.bbc.co.uk/bitesize/ks2/science/physical_processes/
- <http://www.primarygames.com/science.php>
- <http://www.primaryhomeworkhelp.co.uk/revision/Science/>
- <http://www.primaryhomeworkhelp.co.uk/science/index.html>
- <http://www.sciencekids.co.nz/>
- <http://www.crickweb.co.uk/ks2science.html>

*Please note:

Year 5 Science unit- Animals including Humans: Linked to units 1b, 2b, 3b, 4b will be taught through agreed SRE lessons. The statistics element will be used as a context for maths. The objective 'describe the changes as humans develop from birth to old age' has been put at the start of the 'living things' unit. The vocabulary in red in the unit links with this objective.

Year 4- Teaching Year 6 objective



WORKING WITH AND THROUGH OUR KEY CURRICULUM CONCEPTS

We work 'with and through' our six curriculum concepts to support children with remembering and acquiring key knowledge and skills through first hand experiences and use of varied research resources including technology.

Change

- identify physical, chemical and biological changes and explore the science underpinning them
- understand how scientific discoveries have changed the world we live in and give reasoned opinions linked to these
- explore the impact of human choices on the natural world and develop an understanding of what effect this has long-term
- understand how and why living things have evolved over time

Power

- understand the power we, as individuals, have to facilitate change
- explore the different types of power within the living world
- explore and challenge who has the power to influence scientific change

Identity and Belonging

- understand how living things adapt to their environment
- recognise how living things are reliant on each other

Equality and Equity

- explore the inequity across scientific professions and identify reasons behind this
- identify the impact of females across all aspects of sciences
- understand the impact of unequal access to resources across the world

Connections

- identify and understand the links between science and other subjects
- to understand the wide ranging jobs and careers associated with science

Legacy

- identify the significance of scientists' work on the world now and in the future
- recognise and critically discuss the positive and negative impact of humans on the natural world
- explore how we can have a long lasting impact on the environment

