



EYS, KS1 and KS2 SCIENCE PROGRESSION MAP

Overview:

We provide a high-quality science curriculum based on scientific knowledge and conceptual understanding alongside scientific enquiry to lay the foundations for understanding the world. We want our pupils to have the scientific knowledge required to understand the uses and implications of science today and for the future. We aim to develop excitement and curiosity of natural phenomena.

In each year, pupils will be learning to:

Themes within subject	Nursery	Year R	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Observing	Use their senses in hands-on exploration of natural materials Use new modelled language related to exploration Answer simple questions about what they see	Describe what they <u>see, hear and feel</u> – <u>identify what is the same and what different (ELG UW)</u> After close observation, draw <u>pictures.</u> <u>explore the natural world around them (ELG UW)</u> Ask simple questions about what they see	Begin to make observations about what they see, hear, smell and feel Compare and contrast and describe why they have grouped objects Ask more complex questions about what they see, hear, smell and feel	Make observations using all their senses without prompting Ask questions about the world around us and recognise that they can find answers in different ways	Observe detail carefully Use different methods to answer questions, including research, observation and experiments. Ask questions about their scientific topics	Understand that they can use research, observation and experiments to answer their questions Ask questions directly related to their science knowledge	Understand that there are different types of scientific enquiry eg observing over time; identifying and <i>classifying</i> through observation; pattern seeking; Research; <i>comparative</i> or <i>fair testing</i> . Make observations linked to answering the questions. Identify hazards.	Identify which sort of enquiry they will use Make a range of relevant observations. Compare not only based on physical properties but on also knowledge gained through previous enquiry. Identify ways of reducing hazards.
Predicting	Refer to books, displays to support investigations	Predict <i>what will happen</i> during play e.g. with water and floating	Make predictions based on observations	Make predictions based on their questions	Use both research and tests to try to answer questions, making predictions	Make predictions based on scientific knowledge	Plan a test based on a scientific prediction	Choose the best type of enquiry to test a prediction, and say why
Experimenting	Explore how things work	Try out their predictions	Use a magnifying glass and other simple equipment with support	Use simple equipment such as <i>timers</i> , rulers and <i>magnifying glasses</i> Understand that a test should be fair Set up a comparative test	Use more complex equipment such as <i>data loggers</i> with support Start to identify ways to make a test fair	Make decisions about the best way to answer their questions. Suggest what equipment they will need Use thermometers and data loggers. Measure using standard units.	Recognise and control variables Understand that sometimes taking several measurements and averaging can make results more accurate . Choose and use equipment with	Name the variable being changed and the variable being measured. Make decisions to ensure that their results will be as trustworthy as possible – understand the idea of degree of trust. Identify when they may have made



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Analysing, concluding and classifying	Talk about what they see using new and wider vocabulary	Say what happened Start to use comparative terms – eg <i>bigger</i>. Talk about <i>changes</i>. Explain why things <u>work</u> and <u>why</u> they <u>happen</u>	Record data with support in drawing a <i>table</i> Compare relevant objects or pictures with support Use first hand experiences to suggest answers to questions	Compare objects, and suggest ways of comparing or grouping them. Record data in a variety of ways, including a table and a <i>diagram</i>. Use <i>observations</i> and their knowledge to suggest answers to questions. Say what happened in an <i>investigation</i>.	Record <i>data</i> in tables, <i>bar charts</i>, and <i>diagrams</i>. State what they have found out, using their data or observations. Suggest how an investigation could have been improved.	Record data in tables, <i>bar charts</i>, <i>keys</i>, <i>graphs</i> and <i>diagrams</i>, starting to choose the best way to record it. See patterns in results, such as <i>differences</i>, <i>similarities</i> or changes, and describe them. Draw on their scientific knowledge to suggest further questions or <i>explanations</i>.	Choose a recording method that helps them <i>analyse</i> Start to systematically analyse and compare their data Use their scientific knowledge to draw <i>conclusions</i> (<i>identifying patterns</i>) Say whether they applied fair testing effectively	Choose the best recording method and say why – eg scientific diagrams, keys, tables, <i>scatter graphs</i>, <i>line graphs</i>.. Use their scientific knowledge to draw <i>conclusions</i>. (<i>identifying patterns</i>) eg develop keys, analyse data mathematically. Systematically analyse and compare their data. <i>discuss any data which does not fit the rest of the set</i>. Recognise when further tests are necessary and. Suggest improvements Understand that scientists' conclusions help their ideas to change over time.
						Identify what needs to be kept the same to make a test fair.	precision to the nearest integer.	errors. Explain which variables need to be controlled. Take repeat readings when necessary. Choose and use equipment with precision to 2 decimal place)



EYS, KS1 and KS2 SCIENCE PROGRESSION MAP

Topic	Nursery	R	1	2	3	4	5	6
Plants	Plant seeds and care for growing plants. Understand the key features of the life cycle of a plant.	Name and describe basic plants Know plants need water <i>Plant, water, life</i>	Identify at least 2 garden plants and two wild plants Identify <i>leaves, flowers, petals, fruit, roots, bulbs, seeds, trunk, branches, stem</i> evergreen and deciduous <i>observe the growth of something they have planted</i> <i>draw diagrams of different parts of a plant</i>	Know plants grow from seeds and bulbs (observe this) They need water, light and the right temperature. <i>Germination</i> is when a seed starts to grow.	Know role of roots, stem, leaves and flower Know plants need air, light, water, nutrients from soil, and room to grow. Investigation : how water is transported in plants. Understand pollination leads to seed formation then seed dispersal	Know what distinguishes plants as a group from animals (make own food from sunlight, usually do not move around)	Draw a life-cycle for a plant. Know the process of reproduction in plants Know the process of reproduction in animals. Understand difference between <i>asexual</i> and <i>sexual reproduction</i> in plants	



EYS, KS1 and KS2 SCIENCE PROGRESSION MAP

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Animals	Understand the key features of the life cycle of an animal.	Name and describe dog, cat, cow, pig... <i>Name the baby animals puppy, kitten, calf, piglet...</i> Know basic hygiene, eg wash hands. <i>Healthy, clean, dirty</i> Can talk about what is the same and what different about friends and family	Name at least one <i>fish, amphibian, and reptile.</i> Identify <i>cow, dog, cat, pig, blackbird, sparrow, hedgehog, squirrel, badger</i> Identify simple differences between animals – eg legs/no legs, <i>wings, feathers, fur, scales, beak</i>, what they eat. Use terms <i>carnivore, omnivore and herbivore</i> Name, draw and label <i>head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth.</i> say which part of the body is associated with each sense	Know animals including humans have babies (<i>offspring</i>) that grow into adults. Know they need food, water and <i>air</i> Know humans need to eat good foods like <i>vegetables, fruits, things like rice and bread</i> and potatoes, and <i>protein</i>, and not too much <i>fat</i> and <i>sugar</i>. Understand that to stay <i>healthy</i>, humans need to <i>exercise</i> Understand that to stay healthy, keep things clean, including washing hands.	Know that animals, including humans, cannot make their own food. Know they need to eat the right types and amount of food. Know that different animals eat different sorts of food. Know humans and some other animals have <i>skeletons</i> to protect and support them. Know humans have <i>muscles</i> for movement	Know that adult humans have 32 teeth identify teeth – <i>incisors, canines, premolars and molars</i>, wisdom teeth Know what the different teeth do – link to what they eat carnivore/herbivore Know what damages teeth and how to look after them Be able to label the different parts of the <i>digestive system</i> – <i>mouth, tongue, teeth, oesophagus, stomach, small intestine, large intestine</i>	Identify changes for humans as they age, using a timeline. Draw a <i>life-cycle</i> diagram for a human. Understand <i>puberty</i> prepares our bodies for being adult (<i>reproduction</i>) List changes boys and girls go through at <i>puberty</i> Hormones control these changes which can be physical or emotional. Know other animals age at different rates. Draw a <i>life cycle</i> diagram for another mammal (M), an amphibian (A), a reptile (R), an insect (I), a bird (B). Identify <i>differences</i> between these groups eg M only ones that start as babies inside mothers, are fed milk by their mothers, or A and I have thousands of eggs. Vocab: <i>reproduce</i>	Know difference <i>vertebrates and invertebrates</i> Know the 5 vertebrate groups Know some common invertebrate groups, eg insects, spiders, annelids, molluscs) Be able to put example animals into the right group (Linnaeus' system-)Carl Linnaeus- know at least five of the kingdoms Know what microorganisms are and how they can be grouped (Bacteria, viruses) Know that some microorganisms can be used for good. i.e. <i>pencilillium</i>) Identify <i>heart, lungs blood vessels, veins, arteries</i> <i>Investigate pulse-rate</i> Know the <i>function</i> of each, including



Topic	Nursery	R	1	2	3	4	5 Earth and Space	6
Environment	Understand the need to respect and care for the natural environment and all living things.	<i>Identify at least 2 ways we care for the natural world around us, eg..."</i> Identify different features outdoors e.g. cold, damp, shady warm areas. <u>note and record the weather and seasonal features(ELG UW)</u>	Say what differences there are between the four seasons. Include <i>snow, rain, wind, day length, heat, cold,</i> know days are shorter in winter	Identify if something is <i>alive, dead, or never alive.</i> Understand things are <i>suited to the habitats</i> they live in. The habitat provides food, water and <i>shelter.</i> Draw arrows on a <i>food chain</i> to show what eats what (specific living things). Start food chains with plants. Know terms carnivore, herbivore and omnivore	Put rocks into groups eg colour, <i>crumbly, hard, grainy</i>, have <i>crystals</i>, have <i>fossils</i> in them Know fossils are formed when something dies and is buried in rock. Know that soil is a mixture of crumbled rock and dead plants and animals.	Understand a food chain starts with the sun, then a plant, then an animal, usually herbivore then carnivores. Use terms <i>predator, prey, producer.</i> Follow a key to identify animals and plants (link to computing branching databases) Understand that plants and animals can be affected if the <i>environment</i> changes. (links to environmental protection, sustainability and	Know we live on a <i>planet.</i> Know planets orbit a <i>star</i>, in our case the sun. Remember they must not look directly at the sun even with dark glasses. Know there are 8 planets in our <i>solar system</i>, and name them Know planets may have moons <i>orbiting</i> them. Know the Earth, Moon and Sun are roughly <i>spherical.</i>	Know that living things produce offspring of the same kind. Know offspring are similar to but not identical to parents (<i>variation</i>). Understand that variation has meant living things have changed over time. Understand that variation means that animals become more or less able to survive where they live. Understand/ know that animals and plants that are able to survive are <i>adapted</i> to suit



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Materials	describe changes in materials through cooking or observing things melting	Choose materials to build with. <i>Wood, plastic</i>	Name objects and then say what they are made of, covering <i>wood, plastic, glass, metal, water and rock, brick, paper, fabric.</i>	Find out how easily materials can be <i>squashed, bent, twisted and stretched</i> eg wood, metal, plastic, glass, brick, rock, paper cardboard.		Identify whether a material is a <i>solid, a liquid or a gas</i>	Understand meaning of <i>hardness, solubility, transparency, conductivity (thermal and electric), and magnetic.</i>	
	explore collections of materials with similar and/or different properties	<i>Understand some of the changing states of matter.</i>	Say whether a material is <i>hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/not waterproof;</i>	For at least two materials, link a property to how suitable these materials are for particular uses, eg		Know how particles are arranged in solids, liquids and gases. Know that materials can <i>change state</i> when heated or cooled	Group materials by these properties. Understand meaning of <i>dissolving</i> and <i>solution</i> – know that some materials are soluble in water and	



EYS, KS1 and KS2 SCIENCE PROGRESSION MAP

		absorbent/not absorbent; opaque/transparent Group materials eg all hard ones compared to all soft ones. Choose the best material for a specific purpose	bricks used for houses cannot be squashable, material used for windows must be transparent.		Know that evaporation is different from boiling Know evaporation is more rapid at higher temperatures. Know that water evaporates, then condenses to fall as rain Draw a diagram of the water cycle	some not . Know methods of separating materials – filtering, sieving and evaporating. Know a property and associated use of metals, wood and plastic. Give evidence for these properties of materials Know the difference between reversible and irreversible changes Know dissolving, <i>mixing</i> and changes of state are reversible. Know that irreversible changes can make a new material Know burning and action of <i>acid</i> on <i>bicarbonate of soda</i> are irreversible.	
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Topic	Nursery	R	1	2	3	4	5	6
Forces and motion	Explore how different materials float and sink Talk about forces they feel, pushing an object through water, stretching elastic, snap a twig, magnetic attraction	Know some things float and some sink <i>Float, sink, light, heavy</i> <i>Observe and interact with magnets attracting a object.</i>		Know they use a force to bend and squash materials	Understand that the roughness of a surface affects how things move Know friction is a force between two surfaces in contact Know magnetism can act at a distance Know magnets attract and repel each other		Know unsupported objects fall because of gravity between earth and the object. Identify forces and their effects: <i>Air resistance, water resistance, friction</i> Know air resistance, water resistance and friction act between moving surfaces in	



Topic	Nursery	R	1	2	3 Light	4 Sound	5	6
Energy – light, sound, electricity -	explore how you can shine light through some materials, but not others investigate shadows	Observe and interact with light travelling through transparent material and an object casting a shadow..			Know <i>darkness</i> is the absence of <i>light</i> Know we need light to see Know they must not look at the sun directly - light from the sun can be dangerous Realise that light is <i>reflected</i> from surfaces	Know sounds are made by something <i>vibrating</i> Know that sounds travel through something to get to our ears Know the <i>pitch</i> of the sound depends on the thing producing it. Know the faster the vibration the higher the pitch Know the <i>volume</i> of a sound depends on the strength of the	Know that light travels in straight lines Understand that this explains why shadows have the shapes they do. Understand that we (including animals) see a light because it sends light to our eyes Understand that we see other objects because light hits them and they reflect it to our eyes (unless they are black).	



EYS, KS1 and KS2 SCIENCE PROGRESSION MAP

			Know we get <i>shadows</i> when light is blocked by an <i>opaque</i> object. Know that sizes of shadows change, and identify patterns in that eg shadows get bigger or fuzzier when object is near the light.	vibration producing it. Know that sounds get fainter the further away they are	Non shiny surfaces scatter the light so we don't see the beam How a simple optical instrument works (periscope)
				Identify things at home and school that run on <i>electricity</i> Identify the following things in a circuit: <i>Cell, wire, bulb, switch, buzzer, lamp.</i> Know a circuit with everything in a single loop is a <i>series</i> circuit. Know there must be a complete loop for electricity to flow. Know most metals are good <i>conductors</i>. Name some insulators eg wood, plastic. Know an open switch stops the electricity and a closed switch lets it flow.	Use the circuit <i>symbols</i> for bulb, switch, cell, battery, motor, buzzer and wire. Draw accurately a simple circuit diagram. Know that in a series circuit more cells make lights brighter or buzzer sound louder. Know that more cells provide greater voltage, so more energy Use a voltmeter to measure voltage. Know an open switch stops the bulb or buzzer working and a closed switch lets it work Understand that an open switch stops the electrical <i>energy</i> flowing to the bulb or buzzer Identify a parallel circuit. Know that resistance can have an effect on the component in a circuit.