



Progression of Skills for Science



ENQUIRY	EYFS	KS1		Lower KS2		Upper KS2	
	Early Learning Goals Development Matters 30 - 50 months 40 - 60 months	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PLAN	-explore during their play and repeat an action / test making it obvious they are trying to find something out and see if the result is always the same -recognises when a simple comparison is unfair	▪ asking simple questions and recognising that they can be answered in different ways and using different types of scientific enquiries to answer them - with help begin to choose ways to try and answer a question -take a few guided planning decisions - recognise when simple test's unfair -make own suggestions on how to collect data once the data needed has been outlined -make simple prediction if appropriate (based on something they have observed before but without an explanation)		▪ ask relevant questions ▪ set up simple practical enquiries, comparative and fair tests -begin to choose ways to try and answer a question - put forward own ideas and make some planning decisions - suggest ways of making the test fair or if it can't be fair how they will answer it by looking for a pattern - from a selection say what equipment is needed - suggest the type of data needed to be collected - make simple predictions based on everyday experience and knowledge		▪ planning different types of scientific enquiries, including recognising and controlling variables where necessary to answer questions -ask a variety of types of scientific questions -choose the most appropriate scientific enquiry method to answer a question and outline the method -list all the equipment needed -decide what data to collect and how much of it is needed - make predictions based on scientific knowledge	

DO	- observe closely using all of their senses as appropriate - during their play repeat an action/test making it obvious they are trying to find something out and see if the result is always the same - compare 2 (3) things by direct observation	▪ observe closely, using simple equipment ▪ perform simple tests - make observations related to the task or test - use simple equipment provided -measure using uniform non- standard units (e.g. straws) or simple standard units and measuring equipment - meter stick , cm, kg masses, l, jugs & second timer -compare 3 or more things -read scales to nearest labelled division.	▪ making systematic and careful observations and where appropriate taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers - carry out a fair test or pattern seeking enquiry with help -compare 3 or more things -use simple standard measures; m, cm, mm, kg, g, cm3, minutes, seconds, Newton. -measure to the nearest whole or half unit or mixed units. -read scales to the nearest division labelled and unlabelled.	▪ Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate - make a series of measurements adequate for the task - select appropriate measuring equipment - use standard measures as in including use of fractions and mixed units and decimals to one place. -read scales with increased accuracy -compare 5 or more things - select apparatus and use with care -read scales with precision and accuracy appropriate to the task -repeat readings and find averages
RECORD		▪ gather and record data to help in answering questions (Year 2 only) - draw pictures of results/ take photos - help teacher make a class table or chart - complete a simple chart or two column table - make practical block graphs/pictograms - make/draw a block graph with a 1:1 scale	▪ gathering, recording, classifying and present data in a variety of ways to help in answering questions ▪ recording findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables - construct a simple 2 column table - draw bar charts 1:1, 1:2, 1:5 and 1:10 scale and begin to plot line graphs	▪ recording data and results of increasing complexity using scientific diagrams, labels, classification keys tables, scatter graphs, bar and line graphs, and models - present information clearly in tables including for repeat readings - record observations and measurements systematically -draw bar graphs more complex scales possibly involving fractions or decimals e.g. 1:2.5 - draw line graphs, possibly involving fractions and decimals
REVIEW	- Make comparisons - say what happened -order results (first, second, third) -spot similarities and differences	▪ use their observations and ideas to suggest answers to questions - describe observations - say what they have found out - say whether what happened was what they expected	▪ reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions, making predictions for new values ▪ using results to draw simple conclusions and suggest improvements, and raise further questions new questions ▪ identifying differences, similarities or changes related to simple scientific ideas and processes - say what they have found out and give an explanation for observations and simple patterns based on everyday experience	▪ reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, explanations of the degree of trust in results, in oral and written forms such as displays and other presentations ▪ using test results to make predictions to set up further comparative & fair tests ▪ identify scientific evidence that has been used to support or refute ideas or arguments. - use graphs to spot and interpret patterns/trends in results

				- draw conclusions using these patterns and begin to relate conclusions to scientific knowledge and understanding consistent with the evidence - offer simple explanations for differences in repeated measurements/ observations
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BIOLOGY	EYFS	KS1		Lower KS2		Upper KS2	
	Early Learning Goals Development Matters 30 - 50 months 40 - 60 months	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PLANTS	Know about similarities and differences in relation to living things. They make observations of animals and plants...and talk about changes.	Observe changes across the four seasons.	Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees. Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy. Observe and describe how seeds and bulbs grow into mature plants.	Identify and describe the functions of different parts of flowering plants: roots, stem/trunk leaves and flowers. 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. Investigate the way in which water is transported within plants. Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.		Recognise that living things (plants) produce offspring of the same kind but normally offspring vary and are not identical to their parents. Describe the life process of reproduction in some plants. Explain reproduction in plants, including flower structure, wind and insect pollination, fertilisation, seed and fruit formation and dispersal, including quantitative. Investigation of some dispersal mechanisms.	

OURSELVES AND OTHER ANIMALS	Know about similarities and differences in relation to living things They make observations of animals and plants and explain why some things occur, and talk about changes.		Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense. Describe and compare the structure of a variety of common animals fish, amphibians, reptiles, birds and mammals including pets) Notice that animals, including humans, have offspring which grow into adults	Identify that humans and some animals have skeletons and muscles for support, protection and movement.	Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents Describe the life process of reproduction in some animals	Describe the changes as humans develop to old age Describe reproduction in humans, including the structure and function of the male and female reproductive systems, menstrual cycle (without details of hormones), gametes, fertilisation, gestation and birth, to include the effect of maternal lifestyle on the foetus through the placenta Describe differences between species	Know the structure and function of the human skeleton, to include support, protection, movement and making blood cells
KEEPING FIT AND HEALTHY	Know about similarities and differences in relation to living things		Explore and compare the differences between things that are living, dead, and things that have never been alive Find out about and describe the basic needs of animals, including humans, for survival (water, food and air) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	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	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 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.		Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood (including the pulse and clotting).

HABITATS

Know about similarities and differences in relation to living things
Talk about the features of their own immediate environment and how environments might vary from one another.

Make observations of animals and plants

Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals

Identify and name a variety of common animals that are carnivores, herbivores and omnivores

Identify and name a variety of plants and animals in their habitats, including micro-habitats
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

Observe changes across the four seasons

Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food

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 constantly changing and that this can sometimes pose dangers to specific habitats

Construct and interpret a variety of food chains, identifying producers, predators and prey

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 animals based on specific characteristics

Describe the difference in the life cycles of a mammal, an amphibian an insect and a bird

Identify how animals and plants are adapted to suit their environment in different ways and adaption leads to evolution

Describe the interdependence of organisms in an ecosystem, including food webs and insect pollinated crops

Explain how organisms affect, and are affected by, their environment, including the accumulation of toxic materials

Identify differences between species

Understand heredity as the process by which genetic information is transmitted from one generation to the next

PHYSICS	EYFS	KS1		KS2			
	Early Learning Goals Development Matters 30 – 50 months 40 – 60 months	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
ELECTRICITY					Identify common appliances that run on electricity Construct a simple series electrical circuit identifying and naming the basic parts of a simple electrical circuit, including cells, wires, bulbs, switches and buzzers 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 Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit Recognise some common conductors and insulators, and associate metals with being good conductors		Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit 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 Use recognised symbols when representing a simple circuit in a diagram <u>Exceeding (uks2 children can explain)</u> Electric current... Potential difference, measured in volts, battery and bulb rating... Differences in resistance between conducting and insulating components

FORCES AND MOVEMENT	Know about similarities and differences in relation to objects They explain why some things occur, and talk about changes.	<i>(explore things that move including toys that need a push or a pull. Compare how different things move.)</i> Compare how things move on different surfaces Compare and group together a variety of everyday materials on the basis of their simple physical properties <i>(attracted to a magnet or not)</i> <i>(explore toys that use magnets)</i>		Describe the simple physical properties of a variety of everyday materials <i>(attracted to a magnet or not)</i> Notice that some forces need contact between two objects but magnetic forces act at a distance Observe how magnets attract or repel each other and attract some materials and not others 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 Describe magnets as having two poles Predict whether two magnets will attract or repel each other, depending on which poles are facing.		Forces as pushes or pulls, arising from the interaction between two objects Non-contact forces: gravity forces acting at a distance on earth and in space, forces between magnets ... Using force arrows in diagrams, adding forces in one dimension, balanced and unbalanced forces Forces: associated with deforming objects; stretching and squashing-springs; with rubbing and friction between surfaces, with pushing things out of the way; resistance to motion of air and water Forces being needed to cause an object to stop or start moving, or to change their speed or direction of motion Forces measured in newtons...	
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LIGHT	Know about similarities and differences in relation to places, objects & materials They talk about the features of their own immediate environment and how environments might vary from one another.		Observe and describe weather associated with the seasons and how day length varies. <i>(explore making shadows)</i> <i>(observe and name a variety of sources of light, including electric lights, flames and the Sun)</i> <u>Linked with materials</u> Describe the simple physical properties of a variety of everyday materials (<i>opaque, translucent, transparent materials</i>) Compare and group together a variety of everyday materials on the basis of their simple physical properties (<i>opaque, translucent, transparent material</i>)	Recognise that they need light in order to see things and that dark is the absence of light Notice that light is reflected from surfaces Recognise that shadows are formed when a light source is blocked by a solid object Find patterns in the way that the size of shadows change Recognise that light from the Sun can be dangerous and that there are ways to protect our eyes			Recognise that light appears to travel in straight lines Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
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SOUND	Know about similarities and differences in relation to places, objects, materials and living things. Talk about the features of their own immediate environment and how environments might vary from one another. Explain why some things occur, and talk about changes.		<i>(explore different ways of making and altering sounds ... experiment making sounds of differing volume and pitch)</i> <i>(observe and name a variety of sources of sound, noticing that we hear with our ears)</i>		Identify how sounds are made, associating some of them with something vibrating Recognise that vibrations from sound travel through a medium to the ear Recognise that sounds get fainter as the distance from the sound source increases Find patterns between the pitch of a sound and features of the object that produced it Find patterns between the volume of a sound and the strength of the vibrations that produced it.		
EARTH AND SPACE						Describe the movement of the Earth, and other planets relative to the Sun in the solar system Describe the movement of the Moon relative to the Earth Describe the Sun, Earth and Moon as approximately spherical bodies Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky	

CHEMISTRY	EYFS	KS1		KS2			
	Early Learning Goals Development Matters 30 - 50 months 40 - 60 months	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
PROPERTIES OF MATERIALS	Know about similarities and differences in relation to materials	Distinguish between an object and the material from which it is made Compare and group together a variety of everyday materials on the basis of their simple physical properties	Describe the simple physical properties of a variety of everyday materials Identify and compare the uses of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses	Compare and group together different kinds of rocks on the basis of their simple physical properties Recognise that soils are made from rocks and organic matter	Compare and group materials together, according to whether they are solids, liquids or gases Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	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 Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating	

CHANGING MATERIALS	Know about similarities and differences in relation to materials		Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching Describe the simple physical properties of a variety of everyday materials including <i>Flexibility</i> Compare and group together a variety of everyday materials on the basis of their simple physical properties inc. <i>Flexibility</i>)	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 ($^{\circ}\text{C}$) Describe in simple terms how fossils are formed when things that have lived are trapped within rock Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature		Demonstrate that dissolving, mixing and changes of state are reversible changes Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. 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.	
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