



Kingswood Primary School – Science skills progression

By the end of Key Stage 2, children should be adequately equipped to develop a deeper understanding of a wide range of scientific areas. They should do this throughout the school by exploring and talking about their ideas; asking their own questions about scientific phenomena.

Pupils should be taught to (Working scientifically):

Asking questions	Children should be taught from an early age to be inquisitive about their surroundings and why things happen. They should be equipped to ask their own questions, using different ways to answer them. This should enable them to, by the end of Key Stage Two, use different kinds of questions and ways to answer them.
Plan an experiment	From Early Years Phase, children will generate their own ideas and test them through planning an experiment. They will go on to test them scientifically using simple tests, fair tests (when necessary) and explaining how and why they are fair.
Make a prediction	On starting school, children will be encouraged to use their senses to notice similarities and differences. In Key Stage One, they will observe closely to compare things, sort and group them in order to make predictions. In Key Stage Two, they will draw simple conclusions and make plausible predictions.
Record and observing an experiment	Children, from a young age, will be introduced to scientific tools and equipment, making sure to use them carefully. As they go into Key Stage One, they will use these to make measurements. In Key Stage Two, children will use different equipment to measure and make careful observations (recording these accurately in standard units). In Upper Key Stage Two, they will be taught to measure with precision and take repeat readings when appropriate.
Show their findings	At Kingswood, children will go from recording their findings pictorially, to gathering and recording data scientifically. This will include: labelled diagrams, keys, bar charts and tables. At an older age, they will become more independent; choosing which way to record their data and why that would be the appropriate option.
Create a conclusion	All throughout the school, Kingswood learners will be encouraged to question why things have happened. This will enable them to then use scientific language to make a proper conclusion-suggesting improvements, raising further questions and making further plausible predictions based on these.

Topic Studied	Early Years Phase	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Plants	DM: 30-50 Comments and asks questions about some of the things they have observed in the world. Make observations of animals and plants and explain why some things occur, and talk about changes. • The World ELG: Knows about similarities and differences in relation to places, objects, materials and living things • The World ELG: Makes observations of plants and animals	Identify and name a variety of common wild and garden plants. Identify and describe the basic structures of a variety of common flowering plants, including trees. <u>Scientific Vocabulary</u> root stem leaf flower seeds deciduous evergreen petal fruit bulb branch trunk blossom oak holly birch beech ash	Observe and describe how seeds and bulbs grow into mature plants. Find and describe how plants need water, light and a suitable temperature to grow and stay healthy. <u>Scientific Vocabulary</u> plants seeds bulbs mature water light healthy temperature growth roots flowers petal stem insects pollen leaves Sun	Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. I know what plants need for life and growth (air, light, water, nutrients from soil, and room to grow) and how these needs vary from plant to plant. I have investigated the way in which water is transported within plants. Understand the part that flowers play in the life cycle of flowering plants, including pollination, seed			

				formation and seed dispersal. <u>Scientific Vocabulary</u> roots stem trunk leaf/leaves flower stalk veins root hair nutrients seed seedling fruit pollination bud petal pollen nectar seed mature plant			
Animals including humans	DM: 40-60+ shows care and concern for living things and the environment • Make observations of animals and plants and explain why some things occur, and talk about changes.	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. Describe and	Notice that animals including humans, have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans, for survival (water, food and air). Describe the	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. Identify and classify bones in the skeleton. Describe 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,	Describe the changes as humans develop to old age. Understand that all living things have lifecycles.	Identify and name the main parts of the human circulatory system, and describe 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. Identify and name the main parts of

	• The World ELG: Knows about similarities and differences in relation to places, objects, materials and living things • The World ELG: Makes observations of plants and animals PSE: • Health & Self-Care Exceeding: Knows about, and can make healthy choices in relation to, healthy eating and exercise	compare the structure of a variety of common animals. Identify, name and draw and label the basic parts of the human body and say which parts of the body are associated with each sense. <u>Scientific Vocabulary</u> (animals) bird fish amphibian reptile mammal carnivore herbivore omnivore feathers scales fur skin nocturnal <u>Scientific Vocabulary</u> (humans) sight touch hear smell	importance for humans for exercise, eating the right amounts of different types of food, and hygiene. <u>Scientific Vocabulary</u> animal human adult parent young offspring water food air exercise hygiene body healthy diet height growth weight	function of the skeleton in the bodies of humans and some other animals. Explain how muscles help us move. Identify and classify bones in the skeleton. Explain how muscles help us move. <u>Scientific Vocabulary</u> nutrition protein carbohydrate minerals vitamins fats sugars balanced diet skeleton skull spine ribcage pelvis femur calcium muscle contract relax	identifying producers, predators and prey. Describe the function of the skeleton in the bodies of humans and some other animals. <u>Scientific Vocabulary</u> stomach intestines gullet anus mouth canine molar premolar incisor digest producer predator prey fibre sugar carbohydrate fat protein vitamins minerals	the human circulatory system, and describe the functions of the heart, blood vessels and blood. <u>Scientific Vocabulary</u> Circulatory system heart blood vessel veins capillaries lungs respiration pulse ventricle aorta atrium arteries oxygen heart lungs blood
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		taste legs arms hands fingers foot eyes nose mouth skin ears head body heart hair elbows neck					
Materials	• The World ELG: Knows about similarities and differences in relation to places, objects, materials and living things • Exceeding: Knows the properties of some materials and can suggest some of the purposes they are used for • Exceeding: Are familiar with basic scientific concepts such as floating, sinking, experimentation	Know the difference between an object and the material that it is made from. Name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Describe the physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials based on their	Identify everyday materials including wood, metal, plastic, glass, brick, rock, paper and cardboard. Compare the suitability of a variety of everyday materials for particular uses. Describe how the shapes of solid objects made from some materials can be changed by squashing, bending,		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	Compare and group together everyday materials on the basis of their properties. Know that some materials will dissolve in liquid to form a solution. Can 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 of state are reversible changes.	Explain that some changes result in the formation of new materials, and this kind of change is not usually reversible, including changes associated with burning, oxidation, and the action of acid on bicarbonate of soda. <u>Scientific Vocabulary</u> property transparent opaque soluble insoluble solute solution solvent conductor insulator magnetic filter filtrate evaporate burning rusting reversible

		physical properties. <u>Scientific Vocabulary</u> materials properties wood plastic glass metal rock object waterproof absorbent strength natural shiny dull smooth rough stretchy stiff	twisting and stretching. <u>Scientific Vocabulary</u> materials suitable squashing bending twisting stretching shiny dull transparent opaque translucent flexible stiff strong brittle insulator conductor		the rate of evaporation with temperature. <u>Scientific Vocabulary</u> Solid liquid gas state melting boiling evaporation condensation water cycle temperature thermometer degrees Celsius precipitation	<u>Scientific Vocabulary</u> property transparent opaque soluble insoluble solute solution solvent conductor insulator magnetic filter filtrate evaporate burning rusting reversible	
Seasonal Changes	DM: *30-50 Develop an understanding of growth, decay and changes over time	Name the four seasons. Observed changes over the four seasons. Compare the four seasons. Describe weather associated with					

		the seasons and how day length varies. Describe how day length varies in different seasons. <u>Scientific Vocabulary</u> winter summer spring autumn temperature daylight hours night dark Sun Earth moon weather rain snow ice clouds					
Living things and their habitats	The World ELG: Knows about similarities and differences in relation to places, objects, materials and living things		Compare the differences between things that are living, dead, and things that have never been alive. Identify that most living		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	Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals.	Describe how <u>animals</u> are classified into broad groups according to common observable characteristics and based on similarities and differences. Describe how <u>animals</u> are classified into broad groups according to

	• Talks about the features of their own immediate environment and how environments may vary from one another • Exceeding: Knows that the environment and living things are influenced by human activity • Exceeding: Can describe some actions which people in their own community do that help to maintain the area they live in.		things live in habitats to which they are suited. Describe how different habitats provide for the basic needs of different kinds of animals and plants. Explain how animals and plants in a habitat depend on each other. Identify and name a variety of plants and animals in their habitats. Describe how animals obtain their food from plants and other animals, using simple food chains. <u>Scientific Vocabulary</u> plants animals habitats conditions		things in my local and wider environment. Recognise that environments can change and that this can sometimes pose dangers to living things. <u>Scientific Vocabulary</u> habitat climate weather temperature classify humidify shelter conditions adapt adaptation species invertebrate vertebrate bird reptile mammal amphibian fish	bird fish amphibian reptile mammal invertebrate life cycle reproduction growth gestation birth fertilisation germination pollination seed dispersal	common observable characteristics and based on similarities and differences. Describe how <u>microorganisms</u> are classified into broad groups according to common observable characteristics and based on similarities and differences. Give <u>reasons</u> for classifying plants and animals based on specific characteristics. <u>Scientific Vocabulary</u> Mammal reptile amphibians microorganism characteristics classify fungi virus bacteria vertebrate invertebrates species mosses ferns flowering plants conifers algae
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			living dead alive dark light water damp dry food chain producer prey predator environment endangered species				
Forces and magnets				Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can 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		Explain that unsupported objects fall towards the Earth because of the force of <u>gravity</u> acting between the Earth and the falling object. I can identify the effects of <u>air resistance</u> when it acts between moving surfaces. Identify the effects of <u>water resistance</u> when it acts between moving surfaces. Identify the effects of <u>friction</u> when it acts between moving surfaces. Know that some <u>simple machines</u> allow a smaller force to have a greater effect. <u>Scientific Vocabulary</u>	

			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. <u>Scientific Vocabulary</u> push pull force friction surface magnet attract repel magnetic bar magnet contact non- contact iron North Pole South Pole newton meter compass		force newtons gravity friction air resistance upthrust water resistance gear lever pulley drag thrust	
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Light				Notice that light is reflected from surfaces. Recognise that they need light in order to see things and that dark is the absence of light. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. 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. <u>Scientific Vocabulary</u> Light dark reflection			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. I can 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. I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. <u>Scientific Vocabulary</u> Reflect reflection shadow light ray transmit opaque transparent translucent emit absorb prism pupil retina iris optic nerve lens image cornea mirror
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				natural artificial source shadow blocked bright dim mirror absorb transparent Opaque translucent			
Rocks				Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter. Scientific Vocabulary			

				strong hard sedimentary igneous metamorphic grains porous fossil layers erosion soil slate granite chalk sandstone volcano pebble crystal weathering			
Sound					I can identify how sounds are made, associating some of them with something vibrating. I can recognise that vibrations from sounds travel through a medium to the ear. I can find patterns between the pitch of a sound and features of the object that produced it. I can find patterns between the volume of a		

					sound and the strength of the vibrations that produced it. I can recognise that sounds get fainter as the distance from the sound source increases. <u>Scientific Vocabulary</u> vibration pitch volume absorb medium ear drum vibrate cochlea hammer anvil stirrup auditory nerve brain transmit absorb		
Space						I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system. I can describe the movement of the Moon relative to the Earth. I can describe the Sun, Earth and Moon as approximately	

						spherical bodies. I can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky. <u>Scientific Vocabulary</u> Gravity star planet hemisphere attract attraction weight moon orbit revolve rotation axis equator solar system geocentric heliocentric sphere phases	
Evolution and inheritance							I can recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. I can identify how animals and plants

							are adapted to suit their environment in different ways and that adaptation may lead to evolution. <u>Scientific Vocabulary</u> Natural selection characteristic fossils parent species offspring inherit inherited characteristic environment adaptation evolve breed extinction evidence
Electricity					I can identify common appliances that run on electricity. I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. I can identify whether or not a lamp will light in		I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. I can 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. I can use recognised symbols when representing a

				a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. I can recognise some common conductors and insulators, and associate metals with being good conductors. <u>Scientific Vocabulary</u> conductor insulator switch lamp circuit electricity buzzer brightness dim metal plastic battery		simple circuit in a diagram. <u>Scientific Vocabulary</u> conductor insulator battery cell lamp switch circuit component buzzer motor voltage function symbols wire graphite series metal
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					cells wires shock safety		
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