St Peter's CE Primary School – Science Progression of Key Knowledge, Skills and Vocabulary

Our Vision

At St. Peter's, we strive to grow active, knowledgeable and curious young scientific minds which are confident to explore and investigate the world around them. Our children are encouraged to take the lead in their own learning by asking questions, taking risks and learning from mistakes, so that they feel inspired to become the next generation of scientists.

Principles of Good Science Teaching and Learning

Science teaching and learning is good in our school when…

- Children are engaged through practical 'hands-on' investigation.
- Children are enthused, excited and challenged by their learning.
- Children have the confidence to ask questions and solve problems they have posed.
- Children see how their learning is relevant to themselves and the outside world.
- Children are taught by enthusiastic teachers who have good subject knowledge.
- Children are provided with quality resources that are accessible, age-appropriate and enhance their learning.
- Children's knowledge is enriched through learning in their local environment.

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EYFS	Early Learning Goals	Characteristics of Effective Teaching and Learning
Working Scientifically	▪Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions (C&L) ▪Make comments about what they have heard and ask questions to clarify their understanding(C&L) ▪Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate (C&L) ▪Explore the natural world around them, making observations and drawing pictures of animals and plants (UtW)	▪Playing and exploring - children investigate and experience things, and 'have a go' ▪Active learning - children concentrate and keep on trying if they encounter difficulties, and enjoy achievements ▪Creating and thinking critically - children have and develop their own ideas, make links between ideas, and develop strategies for doing things
Vocabulary	look closely, observe, watch, touch, feel, smell, listen, same, different, compare, ask questions, record, sort, group	
Understanding of the World	▪Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class (UtW) ▪Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter (UtW) ▪Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices (PS&ED)	
Vocabulary	***Animals, including humans***- names of animals, live, on land, in water, jungle, desert, North Pole, South Pole, sea, hot, cold, wet, dry, snow, ice, hair (e.g. black, brown, dark, light, blonde, ginger, grey, white, long, short, straight, curly), eyes (e.g. blue, brown, green, grey), skin (e.g. black, brown, white), big/tall, small/short, bigger/smaller, baby, toddler, child, adult, old person, old, young, brother, sister, mother, father, aunt, uncle, grandmother, grandfather, cousin, friend, family, boy, girl, man, woman ***Living things and their habitats-*** plant, tree, bush, flower, vegetable, herb, weed, animal, names of plants and animals they see, name of a contrasting environment (e.g. beach, forest) ***Plants-*** plant, leaf, stem, branch, root, bark, flower, petal, seed, berry, fruit, vegetable, bulb, plant, hole, dig, water, weed, grow, shoot, die, dead, soil, names of plants they grow ***Seasonal Change-***spring, summer, autumn, winter, seasons, sunny, cloudy, hot, warm, cold, shower, raining, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, windy, rainbow, animals, young, plants, flowers ***Materials***- ice, water, frozen, icicle, snow, melt, wet, cold, slippery, smooth, big, bigger, biggest, smaller, smaller, smallest, hard, soft, bendy, rigid, wood, plastic, paper, card, metal, strong, weak, hot, apply heat, waterproof, soggy, not waterproof, best, change, change back ***Light-*** Sun, sunny, light, shadow, shady, clouds, torch, see-through, not see-through, source, light source ***Sound-*** sound, noise, listen, hear, music, voices, bird song, traffic, sirens, thunder, high, low, loud, quiet, soft, volume, crackle, thunder, hum, buzz, roar ***Forces***- float, sink, up, down, top, bottom, surface, move, roll, drop, fly, turn, spin, fall, fast, slow, faster, slower, fastest, slowest, further, furthest, wind, air, water, blow, bounce ***Earth and space***-Sun, Moon, Earth, star, planet, sky, day, night, space, round, bounce, float	

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Working Scientifically	KS1 *(Develop close obs)*	Lower KS2 *(Develop systematic approach)*	Upper KS2 *(Develop Independence)*
Ask Qs and plan Enquiry	Asking simple questions and recognising that they can be answered in different ways.	Asking relevant questions and using different types of scientific enquiries to answer them.	Planning different types of scientific enquiries to answer *their own questions*, including recognising and controlling variables where necessary.
Set Up Enquiry	Performing simple test.	Setting up simple practical enquiries, comparative and fair tests.	Using test results to make predictions to set up further comparative and fair tests.
Observe and Measure	Observing closely, using simple equipment.	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
Record	Gathering and recording data to help in answering questions.	Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
Interpret and Report	Identifying and classifying.	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Identifying differences, similarities or changes related to simple scientific ideas and processes.	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.
Evaluate	Using their observations and ideas to suggest answers to questions	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Using straightforward scientific evidence to answer questions or to support their findings.	Identifying scientific evidence that has been used to support or refute ideas or arguments.
Vocabulary	observe, changes, patterns, grouping, sorting, compare, same, different, identify (name), measure, data, record results, drawing, picture, table, tally chart, present, pictogram, block chart, Venn diagram, ask questions, test, investigate, explore, equipment, resources, magnifying glass, hand lens, ruler, tape measure, metre stick, pipette, syringe, spoon, teaspoon, answer questions, interpret results, scientific enquiry, pattern seeking, comparative testing, observing over time, classifying, researching using secondary sources	practical work, fair testing, relationships, accurate, thermometer, data logger, stopwatch, timer, estimate, data, diagram, identification key, chart, bar chart, prediction, similarity, difference, evidence, information, findings, criteria, values, properties, characteristics, conclusion, explanation, reason, evaluate, improve	variables, independent variable, dependent variable, control variable, evidence, justify, argument (science), causal relationship, accuracy, precision, scatter graphs, bar graphs, line graphs, force meter

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Areas of study	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Animals including humans	▪ 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 compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, and including pets). ▪ Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	▪ Notice that animals, including humans, have offspring which grow into adults. ▪ Find out about and describe the basic needs of 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 amounts of nutrition, and that they cannot make their own food; they get nutrition from what they eat. ▪ Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	▪ Describe the simple functions of the basic parts of the digestive system in humans. ▪ Identify the different types of teeth in humans and their simple functions. ▪ Construct and interpret a variety of food chains, identifying producers, predators and prey. ▪	▪ Describe the changes as humans develop to old age.	▪ 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 of the way their bodies function. ▪ Describe the ways in which nutrients and water are transported within animals, including humans.
Vocabulary	head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, names of animals experienced first-hand from each vertebrate group, parts of the human body including those within the school's RSE policy, senses, touch, see, smell, taste, hear, fingers, skin, eyes, nose, ears, tongue	offspring, reproduction, growth, baby, toddler, child, teenager, adult, old person, names of animals and their babies (e.g. chick/chicken, kitten/cat, caterpillar/butterfly), survive, survival, water, food, air, exercise, heartbeat, breathing, hygiene, germs, disease, food types (e.g. meat, fish, vegetables, bread, rice, pasta, dairy)	nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine	digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, large intestine, rectum, anus, incisor, canine, molar, premolar, herbivore, carnivore, omnivore, producer, predator, prey	Puberty (the vocabulary to describe sexual characteristics in line with the school's RSE policy)	heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, cycle, circulatory system, diet, drugs, lifestyle

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Living things and their habitats		▪ Explore and compare the differences between things that are living, dead, and things that have never been alive ▪ 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 ▪ 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 chains.		▪ Recognise that living things can be grouped in a variety of ways (plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants such as ferns and mosses) ▪ Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment (including plants). ▪ Recognise that environments can change and that this can sometimes pose dangers to living things.	▪ 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 living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals ▪ Give reasons for classifying plants and animals based on specific characteristics.
Vocabulary		living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, names of local habitats (e.g. pond, woodland etc.), names of micro-habitats (e.g. under logs, in bushes etc.),		classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate	life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, cuttings	vertebrates, fish, amphibians, reptiles, birds, mammals, warm-blooded, cold-blooded, invertebrates, insects, spiders, snails, worms, flowering, non-flowering, mosses, ferns, conifers
Plants	▪ 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.	▪ Observe and describe how seeds and bulbs grow into mature plants ▪ Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	▪ 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	▪	▪	▪

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			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 part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			
Vocabulary	leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, names of trees in the local area, names of garden and wild flowering plants in the local area	light, shade, Sun, warm, cool, water, space, grow, healthy, bulb, germinate, shoot, seedling	photosynthesis, pollen, insect/wind pollination, male, female, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal), air, nutrients, minerals, soil, absorb, transport	▪	▪	▪
Seasonal Change	▪ Observe changes across the four seasons. ▪ Observe and describe weather associated with the seasons and how day length varies.			▪	▪	▪
Vocabulary	weather, sunny, rainy, raining, shower, windy, snowy, cloudy, hot, warm, cold, storm, thunder, lightning, hail, sleet, snow, icy, frost, puddles, rainbow, seasons, winter, summer, spring, autumn, Sun, sunrise, sunset, day length			▪	▪	▪
Materials	<u>Everyday materials</u> ▪ Distinguish between an object and the material from which it is made.	<u>Uses of everyday materials</u> ▪ Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass,		<u>States of matter</u> ▪ Compare and group materials together, according to whether they are solids, liquids or gasses.	<u>Properties and changes of materials</u> ▪ Compare and group together everyday materials on the basis of their properties, including	

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	▪ Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. ▪ Describe the simple physical properties of a variety of everyday materials. ▪ Compare and group together a variety of everyday materials on the basis of their simple physical properties.	brick, rock, paper and cardboard for particular uses ▪ Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching		▪ 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 (oC). ▪ Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets ▪ Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution ▪ 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 that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	
Vocabulary	object, material, wood, plastic, glass, metal, water, rock, brick, paper, fabric, elastic, foil, card/cardboard, rubber, wool, clay, hard, soft, stretchy, stiff, bendy, floppy, waterproof, absorbent, breaks/tears, rough, smooth, shiny, dull, see-through, not see-through	opaque, transparent, translucent, reflective, non-reflective, flexible, rigid, shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching		solid, liquid, gas, heating, cooling, state change, melting, freezing, melting point, boiling, boiling point, evaporation, condensation, temperature, water cycle	thermal insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material	

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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.			
Vocabulary			rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorbs water, fossil, bone, flesh, minerals, marble, chalk, granite, sandstone, slate, types of soil (e.g. peaty, sandy, chalky, clay)			
Light			▪ 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 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 an opaque object ▪ Find patterns in the way that the size of shadows change			▪ 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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Vocabulary			light, light source, dark, absence of light, surface, shadow, reflect, mirror, Sun, sunlight, dangerous			straight lines, light rays
Sound				▪ Identify how sounds are made, associating some of them with something vibrating. ▪ Recognise that vibrations from sounds travel through a medium to the ear. ▪ Find patterns between the pitch of a sound and features of the object that produced it. ▪ Find patterns between the volume of a sound and the strength of the vibrations that produced it. ▪ Recognise that sounds get fainter as the distance from the sound source increases.		
Vocabulary				sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, quiet, loud, insulation		
Forces			<u>Forces and magnets</u> ▪ 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		▪ Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. ▪ Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. ▪ Recognise that some mechanisms, including levers, pulleys and gears, allow a	

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			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.		smaller force to have a greater effect.	
Vocabulary			force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole		force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears	
Electricity				▪ Identify common appliances that run on electricity. ▪ Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. ▪ Identify whether 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		▪ 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.

				not a lamp lights in a simple series circuit ▪ Recognise some common conductors and insulators, and associate metals with being good conductors.		
Vocabulary				electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connections, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol		circuit diagram, circuit symbol, voltage
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	▪
Vocabulary					Sun, Moon, Earth, planets (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, Solar System, rotate, star, orbit	

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Evolution and Inheritance						▪ 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 environments in different ways and that adaption may lead to evolution.
Vocabulary						offspring, sexual reproduction, vary, characteristics, adapted, inherited, species, evolve, evolution