# St. Peter's Church of England Primary School

# SCIENCE KEY SKILLS PROGRESSION

| Keys | Early Years Foundation Stage | Key Stage 1 | Lower Key Stage 2 | Upper Key Stage 2 |
|---|---|---|---|---|
| **Scientific Enquiry Skills** | **Researching**  | **Pattern seeking**  | **Observing**  **Testing**  | **Identifying and classifying**  **Problem solving**  |
| **Working Scientifically** | • **C&L (LAU):** Make comments about what they have heard and ask questions to clarify their understanding.<br><br>• **UW (NW):** Explore the natural world around them, making observations and drawing pictures of animals and plants. | • Ask simple questions.<br>• Observe closely, using simple equipment.<br>• Perform simple tests.<br>• Identify and classify.<br>• Use observations and ideas to suggest answers to questions.<br>• Gather and record data to help in answering questions. | • Ask relevant questions.<br>• Set up simple practical enquiries, comparative and fair tests.<br>• Make accurate measurements using standard units, using a range of equipment, for example thermometers and data loggers.<br>• Gather, record, classify and present data in a variety of ways to help in answering questions.<br>• Record findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables.<br>• Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.<br>• Use results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests.<br>• Identify differences, similarities or changes related to simple scientific ideas and processes.<br>• Use straightforward scientific evidence to answer questions or to support findings. | • Plan enquiries, including recognising and controlling variables where necessary.<br>• Take measurements, using a range of scientific equipment, with increasing accuracy and precision.<br>• Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, bar and line graphs, and models.<br>• Report findings from enquiries, including oral and written explanations of results, explanations involving causal relationships, and conclusions.<br>• Present findings in written form, displays and other presentations.<br>• Use test results to make predictions to set up further comparative and fair tests.<br>• Use simple models to describe scientific ideas identifying scientific evidence that has been used to support or refute ideas or arguments. |

# St. Peter's Church of England Primary School

# SCIENCE KEY KNOWLEDGE PROGRESSION

| Keys | Early Years Foundation Stage | Key Stage 1 | Lower Key Stage 2 | Upper Key Stage 2 |
|---|---|---|---|---|
| **Plants**<br><br>**Y1-3** | • **UW (NW):** Explore the natural world around them, making observations and drawing pictures of animals and plants.<br>• **UW (NW):** Know some similarities and differences between the natural world around them and contrasting environments, drawing on theirexperiences and what has been read in class. | • Identify and name a variety of common plants, including garden plants,wild plants and trees and those classified as deciduous and evergreen.<br>• Identify and describe the basic structure of a variety of common floweringplants, including roots, stem/trunk, leaves and flowers.<br>• Observe and describe how seeds and bulbs grow into mature plants.<br>• 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, leaves and flowers.<br>• 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.<br>• Investigate the way in which water is transported within plants.<br>• Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. | |
| | ***Plant, leaf, stem, flower, grow, rain, sun, water, soil, seed,*** | ***Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, light, shade, sun, warm, cool, water, grow, healthy Names of trees in the local area (Names of garden and wild flowering plants in the local area)*** | ***Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)*** | ***Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)*** |
| **Animals Including Humans**<br>**Y 1- 6** | • **PSED (MS):** Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.<br>• **UW (NW):** Explore the natural world around them, making observations and drawing pictures of animals and plants. | • Identify and name a variety of common animals that are birds, fish,amphibians, reptiles, mammals and invertebrates.<br>• Identify and name a variety of common animals that are carnivores,herbivores and omnivores.<br>• Describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles, mammals and invertebrates, includingpets).<br>• Identify name, draw and label the basic parts of the human body and saywhich part of the body is associated with each sense.<br>• Notice that animals, including humans, have offspring which grow intoadults.<br>• Investigate and describe the basic needs of animals, including humans, forsurvival (water, food and air).<br>• 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, that they cannot make their own food and they get nutrition from what they eat.<br>• Construct and interpret a variety of food chains, identifying producers, predators and prey.<br>• Identify that humans and some animals have skeletons and muscles for support, protection and movement.<br>• Describe the simple functions of the basic parts of the digestive system in humans.<br>• Identify the different types of teeth in humans and their simple functions. | • Describe the changes as humans develop to old age.<br>• Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels andblood.<br>• Recognise the impact of diet, exercise, drugs and lifestyle onthe way the human body functions.<br>• Describe the ways in which nutrients and water are transported within animals, including humans |
| | ***Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, heart,*** | ***Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales,feathers, fur, beak, paws, hooves***<br>***Names of animals experienced first-hand from each vertebrate group,***<br>***Parts of the body including those linked to PSHE teaching.***<br>***Senses – touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue***<br><br>***Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult, caterpillar/butterfly), exercise, heartbeat,*** | ***Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints***<br>***Digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach,small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars, herbivore, carnivore, omnivore, producer, predator, prey, food chain*** | ***Puberty***<br>***Heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle***<br>***RSE age-appropriate vocabulary: Year 5: internal, inside, reproductive organs, uterus, fallopian tubes, ovary/ovaries, cervix, vulva, vagina, clitoris, labia, menstruation, menstrual cycle, period, blood, sanitary pads, tampons, re-useable, Adam's apple, penis, testicles, scrotum, sperm, semen, erection, ejaculation, wet dream, pubic hair,*** |
| **Living Things and their Habitats**<br><br>**Y2,4,5 and 6** | • **UW (NW):** Explore the natural world around them, making observations and drawing pictures of animals and plants.<br>• **UW (NW):** 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. | • Explore and compare the differences between things that are living, thatare dead and that have never been alive.<br>• 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.<br>• Identify and name a variety of plants and animals in their habitats,including micro-habitats.<br>• 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.<br>• Explore and use classification keys.<br>• Recognise that environments can change and that this can sometimes pose dangers to specific habitats.<br>• Identify and name a variety of living things in the environment. | • Describe the differences in the life cycles of a mammal, anamphibian, an insect and a bird.<br>• Describe the life process of reproduction in some plants andanimals.<br>• Describe how living things are classified into broad groupsaccording to common observable characteristics.<br>• Give reasons for classifying plants and animals based on specificcharacteristics |
| | ***Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, heart,*** | ***Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed***<br>***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, bulbs, cuttings***<br>***Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering*** |

| | | | | |
|---|---|---|---|---|
| **Evolution and Inheritance**<br><br>**Y6** | | | | • Recognise that living things have changed over time and that fossils provide information about living things that inhabited theEarth millions of years ago.<br>• Recognise that living things produce offspring of the same kind,but normally offspring vary and are not identical to their parents.<br>• Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution<br>***Offspring, sexual reproduction, vary, characteristics, suited,adapted, environment, inherited, species, fossils*** |
| **Properties of Materials including states of matter**<br><br>**Y1,2 and 5** | • **UW (NW)** understand some important processes and changes in the natural world around them, including changing states of matter.<br><br>***Wet, dry, shiny, dull, bendy, stiff, squashy, hard/soft, lumpy, wrinkly. Smooth, rough.*** | • Distinguish between an object and the material from which it is made.<br>• Identify and name a variety of everyday materials, including wood,plastic, glass, metal, water and rock.<br>• Describe the simple physical properties of a variety of everydaymaterials.<br>• Compare and group together a variety of everyday materials on the basis of their simple physical properties.<br>• Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.<br>• Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and paper/cardboard for particular uses<br><br>***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***<br>***Names of materials – wood, metal, plastic, glass, brick, rock, paper, cardboard***<br><br>***Properties of materials, opaque, transparent and translucent, reflective,non-reflective, flexible, rigid***<br>***Shape, push/pushing, pull/puling, twist/twisting, squash/squashing, bend/bending, stretch/stretching*** | • <u>Rocks and Soils</u><br>• Compare and group together different kinds of rocks on the basis of their simple, physical properties.<br>• Relate the simple physical properties of some rocks to their formation (igneous or sedimentary).<br>• Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock.<br>• Recognise that soils are made from rocks and organic matter.<br>• States of matter<br>• Compare and group materials together, according to whether they are solids, liquids or gases.<br>• Observe that some materials change state when they are heated or cooled, and measure the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics.<br>• Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.<br><br>***Rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture,absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil***<br><br>***Solid, liquid, gas, state change, melting, freezing, melting point, boilingpoint, evaporation, temperature, water cycle*** | • Compare and group together everyday materials based onevidence from comparative and fair tests, including their hardness, solubility, conductivity (electrical and thermal), and response to magnets.<br>• Understand how some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.<br>• Use knowledge of solids, liquids and gases to decide how mixturesmight be separated, including through filtering, sieving and evaporating.<br>• Give reasons, based on evidence from comparative and fair tests,for the particular uses of everyday materials, including metals, wood and plastic.<br>• Demonstrate that dissolving, mixing and changes of state are reversible changes.<br>• 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, oxidisation and theaction of acid on bicarbonate of soda.<br><br>***Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve,reversible/non-reversible change, burning, rusting, new material*** |
| **Forces**<br><br>**Y3 and 5** | | | • Compare how things move on different surfaces.<br>• Notice that some forces need contact between two objects, but magnetic forces can act at a distance.<br>• Observe how magnets attract or repel each other and attract some materials and not others.<br>• 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.<br>• Describe magnets as having two poles.<br>• Predict whether two magnets will attract or repel each other, dependingon which poles are facing.<br><br>***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*** | • Explain that unsupported objects fall towards the Earth becauseof the force of gravity acting between the Earth and the falling object.<br>• Identify the effect of drag forces, such as air resistance, waterresistance and friction that act between moving surfaces.<br>• Describe, in terms of drag forces, why moving objects that are notdriven tend to slow down.<br>• Understand that force and motion can be transferred through mechanical devices such as gears, pulleys, levers and springs.<br>• Recognise that some mechanisms including levers, pulleys andgears, allow a smaller force to have a greater effect<br><br>***Force, gravity, Earth, air resistance, water resistance, friction,mechanisms, simple machines, levers, pulleys, gears*** |
| **Light**<br>**Y3 and 6** | | | • Recognise that they need light in order to see things and that dark is the absence of light.<br>• Notice that light is reflected from surfaces.<br>• Recognise that light from the sun can be dangerous and that there are ways to protect their eyes.<br>• Recognise that shadows are formed when the light from a light source is blocked by a solid object.<br>• Find patterns in the way that the size of shadows change.<br><br>***Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous*** | • Recognise that light appears to travel in straight lines.<br>• Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into theeyes.<br>• Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them, andto predict the size of shadows when the position of the light source changes.<br>• Explain that we see things because light travels from the source to our eyes or from light sources to objects and then to our eyes.<br><br>***From Y3/4: Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror,sunlight, dangerous***<br><br>***New Vocabulary: Straight lines, Light rays, Diffraction, Refraction*** |

| | | | | |
|---|---|---|---|---|
| **Sound**<br>**Y4** | | | • Identify how sounds are made, associating some of them with something vibrating.<br>• Recognise that vibrations from sounds travel through a medium to the ear.<br>• Recognise that sound gets fainter as the distance from the sound source increases.<br>• Find patterns between the volume of the sound and the strength of the vibrations that produce it.<br>***Sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation*** | |
| **Electricity**<br><br>**Y4 and 6** | | | • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.<br>• 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.<br>• Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.<br>• Recognise some common conductors and insulators, and associate metals with being good conductors.<br>***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*** | • Use previous knowledge to solve problems<br>• 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<br>• Use recognised symbols when representing a simple circuit in a diagram.<br>• Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.<br>***Circuit, complete circuit, circuit diagram, circuit symbol, cell,battery, bulb, buzzer, motor, switch, voltage***<br><br>***N.B. Children do not need to understand what voltage is, but will use volts and voltage to describe different batteries. The words "cells" and "batteries" are now used interchangeably.*** |
| **Space and Seasonal Changes**<br><br>**Y1 and 5** | • **UW (NW):** Understand some important processes and changes in the natural world around them, including the seasons and changing states ofmatter.<br>***Snow, wind, rain, sun, day, night, stormy, cloudy, hot, cold, foggy.*** | • Observe changes across the four seasons.<br>• Observe and describe weather associated with the seasons and how day length varies<br>***Weather (sunny, rainy, windy, snowy etc.) Seasons (winter, summer, spring, autumn)Sun, sunrise, sunset, day length*** | | • Describe the movement of the Earth relative to the Sun inthe solar system.<br>• Describe the movement of the Moon relative to the Earth<br>• Describe the movement of the Earth, and other planets,relative to the Sun in the solar system.<br>• Describe the Sun, Earth and Moon as approximatelyspherical bodies.<br>• Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across thesky.<br>***Earth, Sun, Moon, spherical, solar system, rotates, star, orbit,planets*** |