Fernhill Primary Academy

Science Progression of skills and knowledge

EYFS	Asking questions and recognizing that they can be answered in different ways.	Making observation and taking measurements.	Engaging in practical enquiry to answer questions.	Recording and presenting evidence.	Answering questions and concluding.
Skills	Demonstrate curiosity about the world around them. With support or prompting, talk about what they think might happen based on their own experiences.	Use senses and simple equipment to explore the world around them, e.g. binoculars and magnifying glasses.	Respond to prompts to say what happened to objects, living things or events.	Talk to an adult about what has been found/found out.	With support, explain why some things occur. With support, talk about what they have found out or what they think might happen next/ change based on their own experiences.
Vocabulary	Questions, Why? Where? When? explore, find out, I think	Observe, describe, measure, magnifying glass, egg timer	Sort, compare, collect	Patterns, name, similarities, differences	Answers, because, I think

Knowledge	Plants (YR– 3)	Living things and their habitats (YR, 2, 4, 5, 6)	Animals including humans (YR-6)	All aspects of science	Seasonal changes (YR,1)	Materials (YR, 1, 2, 4, 5)
	Can talk about some of the things they have observed such as plants Shows care and concern for living things and the environment. Looks closely at similarities, differences, patterns and change. Talk about the features of their own immediate environment and how environments might vary from one another. Make observations of plants and explain why some things occur and talk about changes.	Comments and asks questions about aspects of their familiar world such as the place where they live or the natural world. Can talk about some of the things they have observed such as plants, animals, natural and found objects. Shows care and concern for living things and the environment. Looks closely at similarities, differences, patterns and change Know about similarities and differences in relation to living things and places. Can talk about the feature of their own immediate environment and how environments might vary from one another.	Can talk about things they have observed. (animals) Developing an understanding of growth, decay and changes over time. Shows care and concern for living things and the environment. Make observations of animals and explain why some things occur and talk about changes. Know about similarities and differences in relation to living things. Know the importance of good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.	Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.	Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur and talk about changes.	Can safely use and explore a variety of materials in art and design (children are encouraged to notice changes in properties). Know about similarities and differences in relation to objects and materials. Can talk about changes over time e.g. melting ice.
Vocabulary	Plant, flower, tree, grow	Bird, nest, tree, food, home	Animals, grow, change		Winter, summer, sun, cold	Hard, soft, melting

Year 1	Asking questions and recognizing that they can be answered in different ways.	Making observation and taking measurements.	Engaging in practical enquiry to answer questions.	Recording and presenting evidence.	Answering questions and concluding.
Skills	Ask simple questions stimulated by their exploration of their world. Respond to suggestions to connect what has been observed with possible further actions or observations.	Observe objects, living things, events and the world around them closely, using their senses and simple equipment. Make measurements using nonstandard units of measure.	Perform simple tests to explore a question or idea suggested to them, with support.	Present evidence they have collected in simple templates provided for them to help in answering questions. Present findings in simple templates provided for them or orally. Draw or photograph evidence and label with support.	Respond to suggestions to connect what has been observed with possible further actions or observations. Use their ideas to suggest answers to questions. Say what has changed when observing objects, living things or events.
Vocabulary	Questions, answers, Why? What if? How? I think, because	Equipment, measure, observe, beaker	Gather, test, sort, compare, similarities, differences	Record, results, patterns, table, chart	Explain, reason

Knowledge	Plants (Y1,2,3)	Living things and their habitats (Y2,4,5,6)	Animals including humans (Y1 -6)	Evolution and inheritance	Seasonal changes (YR, 1)	Materials (Y1,2,4,5)
	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.		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, 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.		Observe changes across the four seasons. Observe and describe weather associated with the seasons and how day length varies.	Distinguish between an object and the material from which it is made. 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 properties.
Vocabulary	Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud, Names of local trees Names of garden and wild flowering plants found locally		Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves, Names of animals experience first-hand Names of parts of the boys. Senses – touch, see, smell, taste, hear, fingers, skin, eyes, nose, eat and tongue.		Weather (sunny, rainy, windy, snowy etc) Seasons (winter, summer, spring, autumn) Sun, sunrise, sunset, day length	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-though, not see-through.

Year 2	Asking questions and recognizing that they can be answered in different ways.	Making observation and taking measurements.	Engaging in practical enquiry to answer questions.	Recording and presenting evidence.	Answering questions and concluding.
Skills	Ask simple questions about their experiences and observations and with support use these observations to suggest ways to discover an answer or solve a problem, recognising that some can be answered in a variety of ways.	Observe closely and use equipment provided for observation and measuring correctly. Make measurements using non-standard and standard units of measure.	Identify things to measure or observe that are relevant to the questions or ideas they are investigating using a simple test. Suggest a practical way of how to find things out, or collect data to answer a question or idea they are investigating.	Gather and record data in appropriate ways with increasing independence to help in answering questions. Report on and record findings as drawings, photographs, labelled diagrams, orally, as displays or in simple prepared tables or charts.	Use understanding of what has been observed or own experience/ideas to answer questions. Respond to suggestions to identify some evidence needed to answer a question.
	Question, predict, test.	Stop watch, measure, pipette, syringe	Plan, measure, change.	Chart, Table Pictogram, Tally chart Block diagram / graph	Order, Notice patterns Link ideas Use comparatives – hotter/cooler, older/younger etc

Knowledge	Plants (Y1,2,3)	Living things and their habitats (Y2,4,5,6)	Animals including humans (Y1 -6)	Evolution and inheritance	Seasonal changes	Materials (Y1,2,4,5)
	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.	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 microhabitats. 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.	Notice that animals, including humans have offspring which grow into adults. Find out about and describe the basic needs of animals, including humans, or survival (water, food and air) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.			Identify and compare the suitability of a variety of every day materials, including wood, metal, plastic, glass, 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.
Vocabulary	As for year 1 plus Light, shade, sun, warm, cool, water, grow, healthy	Living, dead, never been alive, suitable, basic needs, food, food chain, shelter, move, feed. Names of local habitats. E.g. pond, woodland. Names of micro-habitats e.g. under logs, in bushes etc.	Offspring, reproduction, growth, child, young/old stages (examples – chick/hen, baby/child/adult, caterpillar/butterfly) exercise, heartbeat, breathing, germs, disease, food types (examples – meat fish, vegetables, bread rice, pasta)			Names of materials – wood, metal, plastic, glass brick, rock, paper, cardboard Properties of materials – as for year 1 plus opaque, transparent and translucent, reflective, non-reflective, flexible, rigid. Shape, push/pushing, pull/pulling, twist/twisting, squash/squashing, bend/bending, stretch/stretching.

Year 3	Asking questions and recognizing that they can be answered in different ways.	Making observation and taking measurements.	Engaging in practical enquiry to answer questions.	Recording and presenting evidence.	Answering questions and concluding. Evaluating and raising further questions and predictions
Skills	Within a group, suggest relevant questions that can be explored further using different types of scientific enquiry.	Use a range of equipment for measuring and observing, including thermometers and data loggers. Take simple, accurate measurements and/or careful observations using whole number standard units relevant to questions or ideas under investigation.	Plan and carry out simple practical enquires, comparative and fair tests relevant to the questions or ideas they are investigating, with support.	Gather and present evidence and data using simple scientific language and vocabulary as writing, drawings, labelled diagrams and displays and through computing, keys, bar charts or tables (using ranges and intervals chosen for them), to help in answering questions. Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions with support/as a group. Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables with support/as a group.	Use straightforward scientific evidence and results of enquiries to answer questions. Say whether what happened was what they expected, acknowledging any unexpected outcomes. Use straightforward scientific evidence to make predictions. With support, use results, observations or own experience to prompt new questions and predictions for a further test.
Vocabulary	Scientific enquiry, Comparative tests Fair test	Similarities/Differences Observations,	Thermometer Data logger	Keys Bar charts, Changes over time Identify, Classify Present Data, Results	Evidence, Conclusion Prediction, Support/Not support

Knowledge	Plants (Y1,2,3)	Living things and their habitats (Y2,4,5,6)	Animals including humans (Y1 -6)	Rocks (YR, 3)	Light (YR, 3, 6)	Forces (YR, 3, 5)
	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, 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 part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Summer 2		Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot take their own food; they get nutrition from what they wat. Identify that humans and some other animals have skeletons and muscles for support, protection and movement.	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 thigs that have lived are trapped within rock. Recognise that solid are made from rocks and organic matter. Revisit Summer 2	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 clocked by an opaque object. Find patterns in the way that the size of shadows change. Summer 2	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 they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having tow poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing.
Vocabulary	Photosynthesis, pollen, insect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)		Nutrition, nutrients, carbohydrates sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints.	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	Light, light source, dark absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous.	Force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole.

Year 4	Asking questions and recognizing that they can be answered in different ways.	Making observation and taking measurements.	Engaging in practical enquiry to answer questions.	Recording and presenting evidence.	Answering questions and concluding. Evaluating and raising further questions and predictions
Skills	Ask relevant questions that can be answered by the appropriate scientific enquiry, research or experiment.	Make systematic and careful observations of objects, living things and events. Choose from a range of provided, appropriate equipment for measuring and observing, including thermometers and data loggers. Take accurate measurements using more complex standard units and parts of units.	Plan and carry out simple practical enquires, comparative and fair tests relevant to the questions or ideas they are investigating. Identify one or more control variables from those provided when conducting a fair test.	Gather and present simple scientific data in a variety of ways as Year 3, including tables and bar charts where intervals and ranges are agreed through discussion, to help in answering questions. Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.	Use straightforward scientific evidence to make further predictions. Use results to make predictions for new values and raise further questions. Use results to answer questions. Identify and use straightforward scientific evidence to support and explain their findings. Use results to suggest improvements.
Vocabulary		Thermometer, data logger	Control. Variable, measure, change	Increase Decrease Accurate Appearance	Predict, conclude.

Knowledge	Sound (YR, 4)	Living things and their habitats (Y2,4,5,6)	Animals including humans (Y1 -6)	Evolution and inheritance	Electricity (YR, 4, 6)	Materials (Y1,2,4,5)
	Identify how sounds are made, associating some of them with something vibrating. Recognise that vibrations from sound 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 produce it. Recognise that sounds get fainter as the distance from the sound source increases.	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 and that this can sometimes pose dangers to living things. *ENGLISH – POLAR BEAR FACT FILE* *Construct and interpret a variety of food chains, identifying producers, predators and prey (Y4 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 Construct and interpret a variety of food chains, identifying, predators and prey. (MOVED TO LIVING THINGS)		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 not a lamp lights in a simple series circuit. Recognise some common conductors and insulators, and associate metals with being good conductors.	Compare and group materials together, according to whether they are solids, liquids or gasses. 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 (^{o}c) Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.
Vocabulary	Sound, source, vibrate, vibration, travel, pitch, (high, low) volume, faint, loud, insulation	Classification, classification keys, environment, habitat, human impact, positive, negative, migrate, hibernate.	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.		Electricity, electrical appliances/device, mains, plug, electrical circuit, complete circuit, component, cell battery, positive, negative, connect/connection, short circuit, crocodile, clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol. (Year 4 do not need to use standard electrical symbols for electrical components,)	Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle

Year 5	Asking questions and recognizing that they can be answered in different ways.	Making observation and taking measurements.	Engaging in practical enquiry to answer questions.	Recording and presenting evidence.	Answering questions and concluding. Evaluating and raising further questions and predictions
Skills	Refine a scientific question so that it can be investigated, choosing an appropriate type of scientific enquiry to provide the best evidence.	Take measurements using a range of scientific equipment with increasing accuracy and precision, identifying the ranges and intervals used. With support, recognise that some measurements and observations may need to be repeated.	Plan enquiries, deciding when it is appropriate to carry out a fair test or another type of practical enquiry from a range suggested. Identify one or more control variables in investigations when conducting a fair test.	Select appropriate ways of gathering and presenting scientific data through models, writing, drawings, displays, computing, tables or graphs (choosing appropriate ranges and intervals). Use correct scientific symbols where appropriate in recording. Present findings in written form, displays and other presentations including orally, explaining results and conclusions drawn from results. Identify causal relationships in reporting outcomes where appropriate.	Recognise when scientific evidence supports an idea or not and use this to support predictions. Use test results to prompt new questions and make predictions for setting up further tests. Use results to answer questions. Recognise when scientific evidence is for or against an argument. Recognise that the test may need improvements to improve reliability.
Vocabulary	Opinion/Fact Variables Independent variable Dependent variable Controlled variable	Precision	Classification keys	Scatter graphs Line graphs	

Knowledge	Plants	Living things and their habitats (Y2,4,5,6)	Animals including humans (Y1 -6)	Forces (YR, 3, 5)	Earth and Space (Y5 only)	Materials (Y1,2,4,5)
		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. Summer 2	Describe the changes as humans develop of old age.	Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effect of air resistance, water resistance and friction, that act between moving surfaces. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.	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.	Compare and group together everyday materials on the basis of their properties, including 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 texts, for the particular uses of every day 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 o change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.
Vocabulary		Life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosis, asexual, plantlets, runners, bulbs, cuttings.	Puberty – the vocabulary to describe sexual characteristics. This is science teaching. (please also note guidance on RSE)	Force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears	Earth, Sun, Moon (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets	dissolve, solution, soluble, insoluble, filter, sieve, reversible/non-reversible change, burning, rusting, new material.

Year 6	Asking questions and recognizing that they can be answered in different ways.	Making observation and taking measurements.	Engaging in practical enquiry to answer questions.	Recording and presenting evidence.	Answering questions and concluding. Evaluating and raising further questions and predictions
Skills	Recognise scientific questions which do not yet have definitive answers and use a range of scientific enquiries to explore possible answers.	Correctly choose and use appropriate equipment to support observation and data collection with increasing accuracy. Decide whether it is appropriate to repeat observations or measurements and explain how this impacts on data collection. Summer 2	Recognise significant variables in investigations, selecting the most suitable to investigate. Controlling variables where appropriate. Summer 2 Recognise which type of practical enquiry is most appropriate to the question or idea being investigated, before planning and carrying out the enquiry.	Decide on the most appropriate formats to present sets of scientific data, such as using line graphs for continuous variables. Summer 2 Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.	Identify scientific evidence that has been used to support or refute ideas or arguments and use this to support predictions. Use test results to make predictions for setting up further comparative and fair tests. Report and present findings from enquiries, including conclusions, causal relationships and explanations of results in oral and written form, such as displays and other presentations. Use results to answer questions. Provide straightforward explanations for differences in repeated measurements or observations. Compare their results with others and give reasons why they may be different. Summer 2
Vocabulary	Degree of trust opinion/fact confidently name scientific enquiry types	systematic		Causal relationships	Refute

Knowledge	Plants	Living things and their habitats (Y2,4,5,6)	Animals including humans (Y1 -6)	Evolution and inheritance (Y6 only)	Light (YR, 3, 6)	Electricity (YR, 4, 6)
		Describe how living things are classified into broad grouped 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.	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.	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 environment in different ways and that adaptation may lead to evolution.	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.	Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used int eh 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.
Vocabulary		Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering, non-flowering.	Heart, pulse, pulse rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle.	Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils.	As for year 3 light plus Straight lines, light rays.	Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage, Volts and voltage. The word cell and battery can be used interchangeably, but children should know both terms.