Progression of skills and knowledge in science

Foundation Stage

P1 Offer explanations for why things might happen, making use of recently introduced vocabulary from stories, non-fiction, rhymes and poems when appropriate. (Speaking)

P2 Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. (Managing Self)

P3 Use a range of small tools, including scissors, paint brushes and cutlery. (Fine Motor Skills)

P4 Explore the natural world around them, making observations and drawing pictures of animals and plants. (Natural World)

P5 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. (Natural World)

P6 Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. (Natural World)

Years 1 & 2

A1 Ask simple questions and know that they can be answered in different ways.

A2 Use simple equipment to observe closely.

A3 Identify and classify.

A4 Perform simple tests.

A5 Use observations and ideas to suggest answers to questions.

A6 Gather and record data to help in answering questions.

A7 Communicate their ideas, what they do and what they find out in a variety of ways.

A8 Use observations and ideas to suggests answers to questions, noticing similarities, differences and patterns.

A9 Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.

A10 Identify and name a variety of common animals that are carnivores, herbivores and omnivores.

A11 Group animals according to what they eat.

A12 Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).

A13 Understand that animals, including humans, have offspring which grow into adults.

A14 Describe the basic needs of animals, including humans, for survival (water, food and air).

A15 Describe the importance for humans of exercise, eating the right amount of different types of food, and hygiene.

A16 Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

A17 Distinguish between and object and the material from which it is made.

A18 Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.

A19 Describe the simple physical properties of a variety of everyday materials.

A20 Compare and group together a variety of everyday materials on the basis of their simple physical properties.

A21 Identify and compare the suitability of a variety of everyday materials for particular uses, including wood, plastic, glass, brick, rock, paper and cardboard for particular uses.

A22 Describe how the shapes of solid objects made from some materials can changed by squashing, bending, twisting and stretching.

A23 Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.

A24 Identify and describe the basic structure of a variety of common flowering plants, including trees.

A25 Observe and describe how seeds and bulbs grow into mature plants.

A26 Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.

A27 Explore and compare the difference between things that are living, dead, and things that have never been alive.

A28 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.

A29 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.

A30 Describe how plants need water, light and a suitable temperature to grow and stay healthy, and describe the impact of changing these.

A31 Observe changes across the four seasons.

A32 Observe and describe weather associated with the season and how day length varies.

<u>Years 3 & 4</u>

B1 Ask relevant questions and use different types of scientific enquiries to answer them.

B2 Set up simple practical enquiries, comparative and fair tests.

B3 Make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.

B4 Gather, record, classify and present data in a variety of ways to help in answering questions.

B5 Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.

B6 Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.

B7 Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.

B8 Identify differences, similarities or changes related to simple scientific ideas and processes.

B9 Use straightforward scientific evidence to answer questions or to support findings.

B10 Identify that humans and some other animals have skeletons and muscles for support, protection and movement.

B11 Identify that animals, including humans, needs the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.

B12 Construct and interpret a variety of food chains, identifying producers, predators and prey.

B13 Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.

B14 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.

B15 Investigate the way in which water is transported within plants.

B16 Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

B17 Recognise that living things can be grouped in a number of ways.

B18 Explore and use classification keys to help group, identify and name a variety of living things in the local and wider environment.

B19 Recognise that environments can change and that this can sometimes pose dangers and have an impact on living things.

B20 Describe the simple functions of the basic parts of the digestive system in humans.

B21 Identify the different types of teeth in humans and their simple functions.

B22 Compare how things move on different surfaces.

B23 Notice that some forces need contact between two objects, but magnetic forces can act at a distance.

B24 Observe how magnets attract or repel each other and attract some materials and not others.

B25 Describe magnets as having two poles.

B26 Predict whether two magnets will attract or repel each other, depending on which poles are facing.
B27 Compare and group together a variety of everyday materials on the basis of whether or not they are attracted to a magnet, and identify some magnetic materials.
B28 Recognise that light is needed in order to see things and that dark is the absence of light.
B29 Recognise that light from the sun can be dangerous and that there are ways to protect eyes.
B30 Recognise that shadows are formed when the light from a light source is blocked by a solid object.
B31 Find patterns in the way that the size of shadows change.
B32 Notice that light is reflected from surfaces.
B33 Recognise that soils are made from rocks and organic matter.
B34 Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.
B35 Describe in simple terms how fossils are formed when things that have lived are trapped within rock.
B36 Identify common appliances that run on electricity.
B37 Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.
B38 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.
B39 Recognise that a switch opens and closes a circuit an associate this with whether or not a lamp lights in a simple series circuit.
B40 Recognise some common conductors and insulators, and associate metals with being good conductors.
B41 Identify how sounds are made, associating some of them with something vibrating.
B42 Recognise that vibrations from sounds travel through a medium to the ear.
B43 Find patterns between the pitch of a sound and features of the object that produced it.
B44 Find patterns between the volume of a sound and the strength of the vibrations that produced it.
B45 Recognise that sounds get fainter as the distance from the sound source increases.
B46 Compare and group materials together, according to whether they are solids, liquids or gases.
B47 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.
B48 Identify the part played by evaporation and condensation in the water cycle, and associate the rate of evaporation with temperature.

<u>Years 5 & 6</u>

C1 Plan different types of scientific enquires to answer questions, including recognising and controlling variables where necessary.
C2 Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
C3 Record data and results of increasing complexity, using scientific diagrams and labels, tables and bar and line graphs.
C4 Use test results to make predictions to set up further comparative and fair tests.
C5 Report and present findings from enquiries, including conclusions, causal relationships and explanation of and degree of trust in results, in oral and written forms, such as displays and other presentations.
C6 Identify scientific evidence that has been used to support or refute ideas or arguments.
C7 Find things out using a wide range of secondary sources of information.
C8 Describe and evaluate their own and other people's scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources.
C9 Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.
C10 Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.
C11 Describe the ways in which nutrients and water are transported within animals, including humans.

C12 Describe the changes as humans develop into old age.
C13 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.
C14 Recognise that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.
C15 Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including by filtering, sieving and evaporating.
C16 Give reasons, based on evidence from comparative and fair tests, for the particular uses of materials, including metals, wood and plastic.
C17 Demonstrate that dissolving, mixing and changes of state are reversible changes.
C18 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.
C19 Explain that unsupported objects fall towards Earth because of the force of gravity acting between Earth and the falling object.
C20 Identify the effects or air resistance, water resistance and friction, that act between moving surfaces.
C21 Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
C22 Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.
C23 Describe the movement of the Moon relative to the Earth.
C24 Describe the Sun, Earth and Moon as approximately spherical bodies.
C25 Use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky.
C26 Recognise that light appears to travel in straight lines.
C27 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.
C28 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.
C29 Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
C30 Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.
C31 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.
C32 Use recognised symbols when representing a simple circuit in a diagram.
C33 Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.
C34 Describe the life process of reproduction in some plants and animals.
C35 Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.
C36 Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
C37 Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
C38 Give reasons for classifying plants and animals based on specific characteristics.
C39 Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.