Year 1 Progression of skills

Working Scientifically

Pupils will be taught to use the following practical scientific methods, processes and skills:

- WS1 asking simple questions and recognising that they can be answered in different ways
- WS2 observing closely, using simple equipment and measurement
- WS3 performing simple tests
- WS4 identifying and classifying
- WS5 using their observations and ideas to suggest answers to questions
- WS6 gathering, recording and communicating data and findings to help in answering questions.
- WS7 use scientific language and read and spell age-appropriate scientific vocabulary
- WS8 begin to notice patterns and relationships

Plants

- Children can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees
- Children can identify and describe the basic structure of a variety of common flowering plants, including trees.

Animals, including Humans

- Children can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals
- Children can identify and name a variety of common animals that are carnivores, herbivores and omnivores
- Children can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)
- Children can identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.

Everyday Materials

- Children can distinguish between an object and the material from which it is made.
- Children can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.
- Children can describe the simple physical properties of a variety of everyday materials.
- Children can compare and group together a variety of everyday materials on the basis of their simple physical properties.

Seasonal Changes

- SC1 observe changes across the four seasons.
- SC2 observe and describe weather associated with the seasons and how day length varies.

Year 2 Progression of skills

Working Scientifically

Pupils will be taught to use the following practical scientific methods, processes and skills:

- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment and measurement
- performing simple tests
- identifying and classifying
- using their observations and ideas to suggest answers to questions
- gathering, recording and communicating data and findings to help in answering questions.
- use scientific language and read and spell age-appropriate scientific vocabulary
- begin to notice patterns and relationships.

Plants

- Child can observe and describe how seeds and bulbs grow into mature plants
- Child can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy

Animals, including Humans

- Child can notice that animals, including humans, have offspring which grow into adults
- Child can find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
- Chid can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.

Everyday Materials

- Child can identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses
- Child can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.

Living Things and their Habitats

- Child can explore and compare the differences between things that are living, dead, and things that have never been alive
- Child can identify that most living things live in habitats to which they are suited
- Child can describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other
- Child can identify and name a variety of plants and animals in their habitats, including micro-habitats
- Child can describe how animals obtain their food from plants and other animals
- Child can understand a simple food chain, and identify and name different sources of food

Year 3 Progression of skills

Working Scientifically

Pupils will be taught to use the following practical scientific methods, processes and skills:

- making decisions, asking relevant questions and using different types of scientific enquiries to answer them
- WS2 setting up simple practical enquiries, comparative and fair tests
- WS3 making systematic and careful observations using notes and simple tables
- WS4 taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- WS5 gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- WS6 recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- WS7 reporting on findings from enquiries, using relevant scientific language, including oral and written explanations, displays or presentations of results and conclusions
- WS8 using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- WS9 identifying differences, patterns, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.
- begin to look for naturally occurring patterns and relationships
- recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.

Plants

- Child can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers
- Child can 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
- Child can investigate the way in which water is transported within plants
- Child can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.

Animals, including Humans

- Child can identify that animals, including humans, need the right types and amount of nutrition, and that they
- Child can cannot make their own food; they get nutrition from what they eat
- Child can identify that humans and some animals have skeletons and muscles for support, protection and movement.

Rocks

- Child can compare and group together different kinds of rocks (including those in the locality) on the basis of appearance and simple physical properties
- Child can describe in simple terms how fossils are formed when things that have lived are trapped within rock
- Child can recognise that soils are made from rocks and organic matter

Light

- Child can recognise that they need light in order to see things and that dark is the absence of light
- Child can notice that light is reflected from surfaces
- Child can recognise that light from the sun can be dangerous and that there are ways to protect their eyes
- Child can recognise that shadows are formed when the light from a light source is blocked by a solid object
- Child can find patterns in the way that the size of shadows change.

Forces and Magnets

- Child can compare how things move on different surfaces
- FM2 notice that some forces need contact between two objects, but magnetic forces can act at a distance
- Child can observe how magnets attract or repel each other and attract some materials and not others
- Child can 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
- Child can describe magnets as having two poles
- Child can predict whether two magnets will attract or repel each other, depending on which poles are facing.

Year 4 Progression of skills

Working Scientifically

Pupils will be taught to use the following practical scientific methods, processes and skills:

- making decisions, asking relevant questions and using different types of scientific enquiries to answer them
- setting up simple practical enquiries, comparative and fair tests
- making systematic and careful observations using notes and simple tables
- taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers
- gathering, recording, classifying and presenting data in a variety of ways to help in answering questions
- recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables
- reporting on findings from enquiries, using relevant scientific language, including oral and written explanations, displays or presentations of results and conclusions
- using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions
- identifying differences, patterns, similarities or changes related to simple scientific ideas and processes
- using straightforward scientific evidence to answer questions or to support their findings.
- begin to look for naturally occurring patterns and relationships
- recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.

Living things and their habitats

- Child can recognise that living things (including those in the locality) can be grouped in a variety of ways
- Child can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment
- Child can recognise that environments can change and that this can sometimes pose dangers to living things.

Animals, including Humans

- Child can describe the simple functions of the basic parts of the digestive system in humans
- Child can identify the different types of teeth in humans and their simple functions
- Child can construct and interpret a variety of food chains, identifying producers, predators and prey.

States of Matter

- Child can explore a variety of everyday materials and develop simple descriptions of the states of matter
- Child can compare and group materials together, according to whether they are solids, liquids or gases
- Child can 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)
- Child can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.

Sound

- Child can identify how sounds are made, associating some of them with something vibrating
- Child can recognise that vibrations from sounds travel through a medium to the ear
- Child can find patterns between the pitch of a sound and features of the object that produced it
- Child can find patterns between the volume of a sound and the strength of the vibrations that produced it
- Child can recognise that sounds get fainter as the distance from the sound source increases.

Electricity

- Child can identify common appliances that run on electricity
- Child can construct a simple series circuit, identifying/naming its basic parts, including cell, wire, bulb, switch and buzzer
- Child can use their circuits to create simple devices
- Child can draw the circuit as a pictorial representation (not necessarily using conventional circuit symbols)
- Child can about precautions for working safely with electricity.
- Child can identify whether or not a lamp will light in a simple series circuit/
- Child 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
- Child can recognise some common conductors and insulators, and associate metals with being good conductors.

Year 5 Progression of skills

Working Scientifically

Pupils will be taught to use the following practical scientific methods, processes and skills:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- 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
- identifying scientific evidence that has been used to support or refute ideas or arguments.
- explore and talk about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.
- recognise that scientific ideas change and develop over time.
- draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.
- Pupils should read, spell and pronounce scientific vocabulary correctly.

Living things and their habitats

- Child can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird
- Child can describe the life process of reproduction in some plants and animals.
- Child can raise questions about their local environment throughout the year.
- Child can find out about the work of naturalists and animal behaviourists.
- Child can find out about different types of reproduction, including sexual and asexual reproduction in plants, and sexual reproduction in animals

Animals, including Humans

- Child can describe the changes as humans develop to old age.
- Child can draw a timeline to indicate stages in the growth and development of humans.
- Child can learn about the changes experienced in puberty.

Properties and changes of materials

- Child can 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
- Child can know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution
- Child can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating
- Child can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic
- Child can demonstrate that dissolving, mixing and changes of state are reversible changes
- Child can 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.

- Child can explore reversible changes, including, evaporating, filtering, sieving, melting and dissolving, recognising that melting and dissolving are different processes.
- Child can explore changes that are difficult to reverse, for example, burning, rusting and other reactions, for example, vinegar with bicarbonate of soda.

Earth and Space

- Child can describe the movement of the Earth, and other planets, relative to the Sun in the solar system
- Child can describe the movement of the Moon relative to the Earth
- Child can describe the Sun, Earth and Moon as approximately spherical bodies
- Child can use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.
- Child can learn that the Sun is a star at the centre of our solar system and that it has eight planets: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune (Pluto was reclassified as a 'dwarf planet' in 2006).
- Child can understand that a moon is a celestial body that orbits a planet (Earth has one moon; Jupiter has four large moons and numerous smaller ones).

Forces

- Child can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
- Child can identify the effects of air resistance, water resistance and friction, that act between moving surfaces
- Child can recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.
- Child can explore the effects of air resistance by observing how different objects such as parachutes and sycamore seeds fall.
- Child can explore the effects of friction on movement and find out how it slows or stops moving objects.
- Child can find out how scientists, for example, Galileo Galilei and Isaac Newton helped to develop the theory of gravitation.

Year 6 Progression of skills

Working Scientifically

Pupils will be taught to use the following practical scientific methods, processes and skills:

- planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary
- taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate
- recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
- using test results to make predictions to set up further comparative and fair tests
- 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
- identifying scientific evidence that has been used to support or refute ideas or arguments.
- explore and talk about their ideas; asking their own questions about scientific phenomena; and analysing functions, relationships and interactions more systematically.
- recognise that scientific ideas change and develop over time.
- draw conclusions based on their data and observations, use evidence to justify their ideas, and use their scientific knowledge and understanding to explain their findings.
- Pupils should read, spell and pronounce scientific vocabulary correctly.

Living things and their habitats

- Child can 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
- Child can give reasons for classifying plants and animals based on specific characteristics.
- Child can know that broad groupings, such as micro-organisms, plants and animals can be subdivided.
- Child can classify animals into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals).
- Child can find out about significance of the work of scientists such as Carl Linnaeus, a pioneer of classification.

Animals, including Humans

- Child can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
- Child can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
- Child can describe the ways in which nutrients and water are transported within animals, including humans.
- Child can explore questions to understand how the circulatory system enables the body to function.
- Child can learn how to keep their bodies healthy and how their bodies might be damaged – including how some drugs and other substances can be harmful to the human body.
- Child can explore the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.

Evolution and Inheritance

- Child 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
- Child can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents
- Child can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
- Child can be introduced to the idea that characteristics are passed from parents to their offspring, i.e. different breeds of dogs, and what happens when, for example, labradors are crossed with poodles.
- Child can appreciate that variation in offspring over time can make animals more or less able to survive in particular environments, for example, by exploring how giraffes' necks got longer.
- Child can find out about the work of palaeontologists such as Mary Anning and about how Charles Darwin and Alfred Wallace developed their ideas on evolution.

Light

- Child can recognise that light appears to travel in straight lines
- Child can 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
- Child 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
- Child can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
- Child can work scientifically by: deciding where to place rear-view mirrors on cars; designing and making a periscope and using the idea that light appears to travel in straight lines to explain how it works.
- Child can look at a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur).

Electricity

- Child can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
- Child 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
- Child can use recognised symbols when representing a simple circuit in a diagram.
- Child can construct simple series circuits, to help them to answer questions about what happens when they try different components, for example, switches, bulbs, buzzers and motors.
- Child can learn how to represent a simple circuit in a diagram using recognised symbols