**Progression of Skills in Science KS2**

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|  | **Content** | **Knowledge** | **Working Scientifically Skills** |
| **Year 3** | ***Scientists and Inventors*** | To 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.  To identify that humans have skeletons for support, protection and movement.  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.  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.  To notice that light is reflected from surfaces. | To identify differences, similarities or changes related to simple scientific ideas and processes by finding out about the men and women who introduced new plants to our gardens.  To identify changes related to scientific ideas by describing Marie Curie’s research into x-rays.  To identify changes related to scientific ideas by describing the achievements of George Washington Carver.  To ask relevant questions and use evidence from scientific enquiries to answer them and support findings by investigating concave and convex mirrors. To gather, record, classify and present data in a variety of ways to help in answering questions by investigating concave and convex mirrors. |
| ***Forces and Magnets*** | To notice that some forces need contact between two objects.  To compare how things move on different surfaces.  To notice that magnetic forces can act at a distance and attract some materials and not others.  To compare and group materials according to whether they are magnetic.  To observe how magnets attract or repel each other and attract some materials and not others.  To describe magnets as having two poles and to predict whether two magnets will attract or repel each other, depending on which poles are facing. | Identifying differences and similarities related to simple scientific processes by grouping mangentic materials.  Making systematic and careful observations by examining magnetic forces.  Use results to draw simple conclusions, make predicitions, suggest improvements and raise further questions. |
| ***Animals Including Humans*** | Identify that they cannot make their own food; they get nutrition from what they eat.  Identify that animals, including humans, need the right types of nutrition.  Identify that humans and some other animals have skeletons for support, protection and movement.  Identify that humans and some other animals have muscles for movement. | Identifying differences and similarities related to simple scientific processes by grouping animals according to their diets.  Setting up simple practical enquiries in the context of investigating pairs of muscles.  Recording findings using simple scientific language by writing the results of the practical investigation. |
| ***Rocks*** | Compare different kinds of rocks based on their appearance.  Group together different kinds of rocks on the basis of their 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. | Making systematic and careful observations by examining different types of rocks.  Identifying changes related to simple scientific ideas in the context of theories about fossils.  Making systematic and careful observations in the context of investigating the permeability of different soils.  Recording findings using simple scientific language. Reporting on findings from enquiries, including presentations of results and conclusions. |
| ***Plants*** | To identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.  To explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow).  To investigate the way in which water is transported within plants.  To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. | To record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables by observing and recording plant growth.  To report on findings from enquiries, including oral and written explanations and presentations of results and conclusions by presenting findings to the class. |
| ***Light*** | To recognise that we need light in order to see things and that dark is the absence of light.  To notice that light is reflected from surfaces.  To recognise that light from the sun can be dangerous and that there are ways to protect our eyes.  To recognise that shadows are formed when the light from a light source is blocked by a solid object.  To find patterns in the way that the size of shadows change. | To report on findings from enquiries, including oral and written explanations and presentations of results and conclusions by presenting findings to the class.  Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. |
| **Year 4** | ***Living Things and Their Habitats*** | To recognise that living things can be grouped in a variety of ways.  To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.  To recognise that environments can change and that this can sometimes pose dangers to living things. | Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions by using a range of methods to sort and group living things.  Identifying differences, similarities or changes related to simple scientific ideas and processes by identifying vertebrates by their similarities and differences.  Using straightforward scientific evidence to answer questions by explaining how they have identified an invertebrate.  Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions by creating tables and keys showing the characteristics of living things.  Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and table by recording observations on a map and in a table.  Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions by writing about and orally presenting findings from research. |
| ***States of Matter*** | To compare and group materials together, according to whether they are solids, liquids or gases.  To 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).  To associate the rate of evaporation with temperature.  To identify the part played by evaporation and condensation in the water cycle. | To make systematic, careful and accurate observations and measurements and report on findings from enquiries by displaying results and conclusions by investigating the effect of temperature on drying washing.  To identify changes relating to simple scientific ideas and processes by exploring the discovery of oxygen. |
| ***Scientists and Inventors*** | To recognise that environments can change and that this can sometimes pose dangers to living things.  To recognise that vibrations from sounds travel through a medium to the ear.  To compare and group materials together, according to whether they are solids, liquids or gases.  To 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).  Identify common appliances that run on electricity.  To identify the different types of teeth in humans and their simple functions. | To set up simple practical enquiries and report findings from enquiries in the context of soil erosion.  To report on findings, including oral and written presentations and displays in the context of Alexander Graham Bell’s invention of the telephone.  To take accurate measurements using standard units and a range of equipment, including thermometers by comparing the Kelvin scale with Celsius.  To identify changes related to scientific ideas and processes by exploring the work of Thomas Edison.  To use scientific evidence from comparative tests to support their findings by comparing different tooth pastes. |
| ***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 some common conductors and insulators, and associate metals with being good conductors.  Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. | To report on findings, including oral and written explanations in the context of preparing a presentation on how electricity is generated.  Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.  Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.  Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions in the context of making and investigating different switches. |
| ***Animals including Humans*** | To describe the simple functions of the basic parts of the digestive system in humans.  To identify the different types of teeth in humans and their simple functions.  To construct and interpret a variety of food chains, identifying producers, predators and prey. | To use straightforward scientific evidence to answer questions by reading an explanation text and answering questions.  To identify differences, similarities or changes related to simple scientific ideas and processes by comparing human and animal teeth.  To ask relevant questions and use different types of scientific enquiries to answer them by distinguishing between scientific and non-scientific questions and choosing between types of scientific enquiry.  To make systematic and careful observations by observing the changes that occur in their enquiry or test. To use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions By presenting findings, making predictions and raising questions about results. |
| ***Sound*** | To identify how sounds are made, associating some of them with something vibrating.  To find patterns between the volume of a sound and the strength of the vibrations that produced it.  To recognise that vibrations from sounds travel through a medium to the ear.  To recognise that sounds get fainter as the distance from the sound source increases. | To ask relevant questions and use different types of scientific enquiries to answer them by distinguishing between scientific and non-scientific questions and choosing between types of scientific enquiry. |
| **Year 5** | ***Properties and Changes of Materials*** | To compare and group together everyday materials on the basis of their properties, including their hardness, transparency and response to magnets.  To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.  To compare and group together everyday materials on the basis of their thermal conductivity and electrical conductivity.  To know that some materials will dissolve in liquid to form a solution.  To compare and group together everyday materials on the basis of their solubility.  To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.  To demonstrate that dissolving, mixing and changes of state are reversible changes.  To describe how to recover a substance from a solution.  To 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. | To plan different types of scientific enquiries to answer question in the context of checking the thermal conductivity.  To ask relevant questions and use different types of scientific enquiries to answer them.  To record data and results of increasing complexity using tables.  To take measurements using a range of scientific equipment, with increasing accuracy and precision, taking repeat recordings when appropriate. |
| ***Forces*** | To explain that unsupported objects fall towards the Earth because of the force of gravity 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 smaller force to have a greater effect. | To use test results to make predictions in the context of making predictions about forces.  To take measurements using a range of scientific equipment, with increasing accuracy and precision, taking repeat recordings when appropriate. |
| ***Living Things and Their Habitats*** | To describe the life process of reproduction in some plants and animals.  To describe the life cycle of a mammal.  To describe the differences in the life cycles of an amphibian, an insect and a bird. | To record data and results of increasing complexity usingclassification keys, scientific diagrams and labels. |
| ***Earth and Space*** | Describing the Sun, Earth and Moon as approximately spherical bodies.  Describing the movement of the Earth, and other planets, relative to the Sun in the solar system.  Using the idea of the Earth’s rotation to explain day and night and the apparent movement of the Sun across the sky. | Identifying scientific evidence that has been used to support or refute ideas or arguments in the context of the shift from heliocentric models of the solar system to geocentric models.  Identifying scientific evidence that has been used to support or refute ideas or arguments in the context of the evidence for the Earth’s rotation. |
| ***Scientists and Inventors*** | To find out about the work of naturalists and animals behaviourists.  To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.  To describe the life process of reproduction in some plants and animals. | To identify scientific evidence that has been used to support or refute ideas or arguments in the context of how CSI technicians use evidence to solve crimes.  To plan different types of scientific enquiries to answer question in the context of checking the accuracy of the proportions described in da Vinci’s Vitruvian Man.  To use test results to make predictions in the context of making predictions about height and length.  To identify scientific evidence that has been used to support or refute ideas in the context of the theories surrounding the alignment of the stones at Stonehenge. |
| ***Animals including Humans*** | Describe the changes as humans develop to old age. | Record data and results of increasing complexity using bar and line graphs in the context of the growth of babies in height and/or weight during their first year after birth.  Report findings from enquiries, including oral and written explanations of results in the context of the gestation period for animals.  Record data and results of increasing complexity using bar and line graphs, and models in the context of comparing gestation periods and life expectancies of animals.  Reporting and presenting findings from enquiries, including causal relationships by analysing data on gestation periods and life expectancies of animals. |
| **Year 6** | ***Evolution and Inheritance*** | 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.  Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.  Identify how adaptation may lead to evolution. | Identifying scientific evidence that has been used to support or refute ideas or arguments; Identify how adaptation may lead to evolution by examining the theories of evolution constructed by Darwin and Wallace.  Identifying scientific evidence that has been used to support or refute ideas or arguments.  Identifying scientific evidence that has been used to support or refute ideas or arguments; Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago in the context of the evolution of human beings. |
| ***Scientists and Inventors*** | To give reasons for classifying plants and animals based on specific characteristics.  To recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.  To use recognised symbols when representing a simple circuit in a diagram. | To report and present findings from enquiries, including causal relationships, in oral and written forms such as displays and other presentations in the context of Stephen Hawking and his findings on black holes.  To identify scientific evidence that has been used to support or refute ideas or arguments in the context of the race to discover the structure of DNA.  To record data using scatter graphs in the context of Fleming’s discovery of penicillin. |
| ***Animals including Humans*** | To identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.  To 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. | To plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary taking measurement with increasing accuracy and precision, taking repeat reading when appropriate.  To identify scientific evidence that has been used to support or refute ideas or arguments in the context of changing attitudes to smoking. |
| ***Light*** | To 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.  To 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.  To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. | To identify scientific evidence that has been used to support or refute ideas or arguments by performing a shadow puppet show about Isaac Newton.  To take measurements using a range of scientific equipment, with increasing accuracy and precision, taking repeat recordings when appropriate. |
| ***Living Things and their Habitats*** | To 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. | To record data using scientific diagrams and labels.  Report and present finding from enquiries. |
| ***Electricity*** | To 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.  To use the recognized symbols when representing a simple circuit in a diagram. | Identifying scientific evidence that has been use to support or refute ideas or arguments in the context of the major discoveries made by scientists in the field of electricity.  Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary by investigating wire length and brightness of bulbs.  Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.  Reporting and presenting findings from enquiries including conclusions, casual relationships and explanations of and degrees of trust in results in oral and written forms such as displays and their presentations.  Using test results to make predictions to set up further comparative and fair tests.  To take measurements using a range of scientific equipment, with increasing accuracy and precision, taking repeat recordings when appropriate. |