|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| St Mary’s Catholic Primary School – Science Curriculum Progression | | | | |
| Science Intent | Science provides the foundation for understanding the world around us. Engaging children’s natural curiosity, imagination and excitement; science enables children to explore, learn and make sense of the world they live in. Our creative science curriculum will enable children to gain positive attitudes towards scientific knowledge and investigative processes; to understand both the uses and implications of science today, and in  the future. | | | |
| EYFS –see Development Matters 2021 for detailed examples of how to support learning in EYFS  Understanding the world involves guiding children to make sense of their physical world and their community. The frequency and range of children’s personal experiences increases their knowledge and sense of the world around them – from visiting parks, libraries and museums to meeting important members of society such as police officers, nurses and firefighters. In addition, listening to a broad selection of stories, non-fiction, rhymes and poems will foster their understanding of our culturally, socially, technologically and ecologically diverse world. As well as building important knowledge, this extends their familiarity with words that support understanding  across domains. Enriching and widening children’s vocabulary will support later reading comprehension. | | | | |
| 0-3 YEARS | | 3-4 YEARS | | RECEPTION |
| Explore materials with different properties.  Explore natural materials, indoors and outside.  Explore and respond to different natural  phenomena in their setting and on trips. | | Use all their senses in hands on exploration of  natural materials.  Explore collections of materials with similar and/or  different properties.  Talk about what they see, using a wide vocabulary.  Explore how things work.  Plant seeds and care for growing plants.  Understand the key features of the life cycle of a  plant and an animal.  Begin to understand the need to respect and care  for the natural environment and all living things.  Explore and talk about different forces they can  feel. | | ELG: The Natural World Children at the expected level  of development will:  Explore the natural world around them, making observations and drawing pictures of animals and plants;  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;  Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter. |
| Area of Study | Years 1/2/3 | | Years 4/5/6 | |
| Asking Questions | National Curriculum. Pupils should be taught to:  KS1  Asking simple questions and recognising that they can be answered in different ways.  KS2  Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary | | | |
|  | Explore the world around them and raise their own simple questions  Start to ask questions about the world around them  Responds to suggestions with own ideas  Raise their own relevant questions about the world around them  Should be given a range of scientific experiences including different types of science enquiries to answer questions  Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions | | Raise their own relevant questions about the world around them  Should be given a range of scientific experiences including different types of science enquiries to answer questions  Start to make their own decisions about the most appropriate type of scientific enquiry they might use to answer questions.  Use their science experiences to explore ideas and raise different kinds of questions  Talk about how scientific ideas have developed over time  Make links between concepts | |
| Observing | National Curriculum. Pupils should be taught to:  KS1  Observing closely, using simple equipment  KS2  Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat  readings when appropriate | | | |
|  | With guidance, they should begin to notice patterns and relationships  Use simple features to compare objects, materials and living things and, with help, decide how to sort and group them (identifying and classifying)  Observe closely using simple equipment with help, observe changes over time  Make systematic and careful observations  Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used  Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them  Take accurate measurements using standard units learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately  Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data. | | Decide how to record data and results of increasing complexity from a choice of familiar approaches: scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs  Make systematic and careful observations  Help to make decisions about what observations to make, how long to make them for and the type of simple equipment that might be used  Begin to look for naturally occurring patterns and relationships and decide what data to collect to identify them  Take accurate measurements using standard units learn how to use a range of (new) equipment, such as data loggers / thermometers appropriately  Collect and record data from their own observations and measurements in a variety of ways: notes, bar charts and tables, standard units, drawings, labelled diagrams, keys and help to make decisions about how to analyse this data.  Make a series of observations and measurements and vary one factor while keeping others the same.  Record observations, to support comparisons and measurements using tables and bar charts and begin to plot points to form simple graphs. | |
| Investigate | National Curriculum. Pupils should be taught to:  KS1  Performing simple tests  KS2  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, 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. | | | |
|  | Experience different types of science enquiries, including practical activities  Begin to recognise different ways in which they might answer scientific questions  Carry out simple tests  Follow instructions safely  Ask people questions and use simple secondary sources to find answers  Use simple measurements and equipment (e.g. hand lenses, egg timers) to gather data  Set up simple practical enquiries, comparative and fair test  Recognise when a simple fair test is necessary and help to decide how to set it up  Talk about criteria for grouping, sorting and classifying; and use simple keys  Recognise when and how secondary sources (books, internet) might help them to answer questions that cannot be answered through practical investigations  I carry out fair tests with some help, recognising and explaining what makes them fair. | | Set up simple practical enquiries, comparative and fair test  Recognise when a simple fair test is necessary and help to decide how to set it up  Talk about criteria for grouping, sorting and classifying; and use simple keys  Recognise when and how secondary sources (books, internet) might help them to answer questions that cannot be answered through practical investigations  I carry out fair tests with some help, recognising and explaining what makes them fair.  Decide on an appropriate approach, including using a fair test to answer a question.  Select suitable equipment and information from that provided.  Select and use methods that are adequate for the task.  Use and develop keys and other information records to identify, classify and describe living things and materials, and identify patterns that might be found in the natural environment  Following instructions, taking action to control obvious risks to themselves.  Select and use methods to obtain data systematically.  Recognise hazard symbols and make, and act on, simple suggestions to control obvious risks to themselves and others. | |
| Evaluate and Explain | National Curriculum. Pupils should be taught to:  KS1  Using their observations and ideas to suggest answers to questions  Gathering and recording data to help in answering questions.  KS2  Using test results to make predictions to set up further comparative and fair tests | | | |
|  | Record simple data  Use their observations and ideas to suggest answers to questions  Talk about what they have found out and how they found it out  Use drawings and charts to show their findings With guidance they can use scientific language to explain their findings  Say whether what happened was what the expected.  With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions  Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions  With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.  Suggest improvements to their work. | | With help, pupils should look for changes, patterns, similarities and differences in their data in order to draw simple conclusions and answer questions  Use relevant simple scientific language to discuss their ideas and communicate their findings in ways that are appropriate for different audiences, including oral and written explanations, displays or presentations of results and conclusions  With support, they should identify new questions arising from the data, making predictions for new values within or beyond the data they have collected and finding ways of improving what they have already done.  Suggest improvements to their work.  Communicate conclusions using appropriate scientific language  Identify scientific evidence that has been used to support or refute ideas or arguments  Interpret data containing positive and negative numbers.  Begin to relate conclusions to patterns in data, including graphs, and to scientific knowledge and understanding.  Analyse findings to draw scientific conclusions that are consistent with the evidence.  Communicate these using scientific and mathematical conventions and terminology  Suggest improvements to work, giving reasons.  Evaluate their working methods to make practical suggestions for improvements.  Reflect on their results and consider whether they are valid. | |
|  | Key Vocabulary | | | |
| Plants | Leaf, flower, blossom, petal, fruit, berry, root, seed, trunk, branch, stem, bark, stalk, bud  Names of trees in the local area  As for above plus - light, shade, sun, warm, cool, water, grow, healthy.  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 | |  | |
| Animals including Humans | Head, body, eyes, ears, mouth, teeth, leg, tail, wing, claw, fin, scales, feathers, fur, beak, paws, hooves. Names of animals experienced first-hand from each vertebrate group.  Parts of the body including those linked to PSHE teaching Senses, touch, see, smell, taste, hear, fingers (skin), eyes, nose, ear and tongue  Offspring, reproduction, growth, child, young/old stages (examples - chick/hen, baby/child/adult,) exercise, heartbeat,  breathing, hygiene, germs, disease, food types (examples – meat, fish, vegetables, bread, rice, pasta) | | Nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, support, protect, move, skull, ribs, spine, muscles, joints.  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 This needs to be taught alongside PSHE Puberty: the vocabulary to describe sexual characteristics.  Heart, pulse, rate, pumps, blood, blood vessels,  transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs and lifestyle | |
| Uses of Everyday Materials | 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 transparent and translucent, reflective, non- reflective, flexible, rigid Shape, push/pushing, pull/puling, twist/twisting, squash/squashing. bend/bending, stretch/stretching | | Reversible, irreversible, hardness, solubility, transparency, conductivity, electrical, thermal, dissolve, solution, solids, liquids, gases, filtering, sieving, evaporating, | |
| Seasonal Changes | Weather (sunny, rainy, windy, snowy etc.), seasons (Winter, Summer, Spring, Autumn), sun, sunrise, sunset, day length | |  | |
| Living Things and Their Habitats | Living, dead, never been alive, suited, suitable, basic needs, food, food chain, shelter, move, feed, 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.  Vertebrates, fish, amphibians, reptiles, birds, mammals, invertebrates, insects, spiders, snails, worms, flowering and non- flowering | |
| Rocks | 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 and Sounds | Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation | | Light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation. As for year 3/4 plus straight lines, light rays. | |
| Forces and Magnets | 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, force, gravity, Earth, air resistance, water resistance friction, mechanisms, simple machines, levers, pulleys, gears | |  | |
| States of matter / Properties and changes of materials |  | | Solid, liquid, gas, state change, melting, freezing, melting point, boiling point, evaporation, temperature, water cycle.  Thermal/electrical insulator/conductor, change of state, mixture, dissolve, solution, soluble, insoluble, filter, sieve reversible/non- reversible change, burning, rusting, new material | |
| Electricity |  | | 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. N.B. Children in year 4 do not need to use standard symbols as this is taught in year 5/6. Circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage NB 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 | |
| Earth and Space |  | | Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune) spherical, solar system, rotates, star, orbit, planets | |
| Evolution and Inheritance |  | | Offspring, sexual reproduction, vary, characteristics, suited, adapted, environment, inherited, species, fossils | |

What We Will Teach In Each Class Over a Three Year Cycle

|  |  |  |
| --- | --- | --- |
|  | Years 1/2/3 | Years 4/5/6 |
| Cycle 1 | Year 1 Animals Including Humans  I can identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.  I can identify and name a variety of common animals that are carnivores, herbivores and omnivores.  I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)  I 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. | Year 6 Animals including Humans  I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.  I can recognise the impact of diet, exercise, drugs and lifestyle on the way our bodies function.  I can describe the ways in which nutrients and water are transported within animals, including humans. |
| Year 1 Plants  I can identify and name a variety of common wild and garden plants, including deciduous and evergreen trees.  I can identify and describe the basic structure of a variety of common flowering plants, including trees. | Year 6 Evolution and Inheritance  I 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.  I can recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.  I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. |
| Year 3 Forces and Magnets  I can compare how things move on different surfaces.  I can notice that some forces need contact between two objects, but magnetic forces can act at a distance.  I can observe how magnets attract or repel each other and attract some materials and not others.  I 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.  I can describe magnets as having two poles and I can predict whether two magnets will attract or repel each other, depending on which poles are facing. | Year 5 Earth and Space  I can describe the movement of the Earth, and other planets, relative to the Sun in the solar system.  I can describe the movement of the Moon relative to the Earth.  I can describe the Sun, Earth and Moon as approximately spherical bodies.  I can use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the sky. |
| Year 2 Living Things and their Habitats  I can explore and compare the differences between things that are living, dead, and things that have never been alive.  I can identify that most living things live in habitats to which they are suited and I can describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other.  I can identify and name a variety of plants and animals in their habitats, including microhabitats.  I can 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. | Year 5 Living Things and Their Habitats  I can describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.  I can describe the life process of reproduction in some plants and animals. |
| Year 4 Animals Including Humans  I can describe the simple functions of the basic parts of the digestive system in humans.  I can identify the different types of teeth in humans and their simple functions.  I can construct and interpret a variety of food chains, identifying producers, predators and prey. |
| Cycle 2 | Year 1 Seasonal Changes  I can observe changes across the four seasons.  I can observe and describe weather associated with the seasons and how day length varies. | Year 4 States of matter  I can compare and group materials together, according to whether they are solids, liquids or gases.  I 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)  I can identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. |
| Year 3 Animals including humans  I can identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat.  I can identify that humans and some other animals have skeletons and muscles for support, protection and movement. | Year 4 Electricity  I can identify common appliances that run on electricity.  I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.  I can 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.  I recognise that a switch opens and closes a circuit and I associate this with whether or not a lamp lights in a simple series circuit.  I recognise some common conductors and insulators, and associate metals with being good conductors. |
| Year 1 Everyday Materials  I can distinguish between an object and the material from which it is made.  I can identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.  I can describe the simple physical properties of a variety of everyday materials.  I can compare and group together a variety of everyday materials on the basis of their simple physical properties. | Year 5 Properties and Changes in Materials  I 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.  I know that some materials will dissolve in liquid to form a solution, and I can describe how to recover a substance from a solution.  I can use my knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.  I can give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.  I can demonstrate that dissolving, mixing and changes of state are reversible changes.  I 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. |
| Year 3 Light  I recognise that we need light in order to see things and that dark is the absence of light.  I know that light is reflected from surfaces.  I recognise that light from the sun can be dangerous and that there are ways to protect our eyes.  I recognise that shadows are formed when the light from a light source is blocked by an opaque object.  I can find patterns in the way that the size of shadows change. | Year 5 Forces  I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.  I can identify the effects of air resistance, water resistance and friction, that act between moving surfaces.  I recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. |
| Year 2 Plants  I can observe and describe how seeds and bulbs grow into mature plants.  I can find out and describe how plants need water, light and a suitable temperature to grow and stay healthy | Year 4 Living Things and Their Habitats  I recognise that living things can be grouped in a variety of ways.  I can explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment.  I recognise that environments can change and that this can sometimes pose dangers to living things |
| Cycle 3 | Year 3 Rocks  I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.  I can describe in simple terms how fossils are formed when things that have lived are trapped within rock.  I recognise that soils are made from rocks and organic matter. | Year 6 Electricity  I associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.  I 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.  I can use recognised symbols when representing a simple circuit in a diagram. |
| Year 2 Uses of Everyday Materials  I 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.  I can find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching | Year 5 Animals including Humans  I can describe the changes as humans develop to old age. |
| Year 4 Sound  I can identify how sounds are made, associating some of them with something vibrating.  I can recognise that vibrations from sounds travel through a medium to the ear.  I can find patterns between the pitch of a sound and features of the object that produced it.  I can find patterns between the volume of a sound and the strength of the vibrations that produced it.  I recognise that sounds get fainter as the distance from the sound source increases. |
| Year 3 Plants  I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.  I 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.  I can investigate the way in which water is transported within plants.  I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. | Year 6 Living things and their habitats  I can 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.  I can give reasons for classifying plants and animals based on specific characteristics. |
| Year 2 Animals Including Humans  I know that animals, including humans, have offspring which grow into adults.  I can find out about and describe the basic needs of animals, including humans, for survival (water, food and air)  I can describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. | Year 6 Light  I can recognise that light appears to travel in straight lines.  I 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  I 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.  I can use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. |