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**Science at St Augustine’s Catholic Primary School**

**End Points for Curriculum coverage**

**and Working Scientifically**

*“Science is fun. Science is curiosity. We all have natural curiosity. Science is a process of investigating. It's posing questions and coming up with a method. It's delving in.”*

***Sally Ride – Astronaut and physicist.***

The science curriculum is designed with clear ‘key knowledge and skill’ end points at the end of each term, which are then built upon from year group to year group.**We build upon the learning and skill development of the previous years. As the children’s knowledge and understanding increases, and they become more proficient in selecting, using scientific equipment, collating and interpreting results, they become increasingly confident in their growing ability to come to conclusions based on real evidence.**

English skills such as formal writing, note taking, labelling and captioning, explaining and describing, as well as a number of mathematical skills, such as graphing, measuring and a range of practical skills are contextualised and integrated in our science curriculum.

***Area of Science Key***

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| *Biology* | *Chemistry* | *Physics* |

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| ***EYFS -Reception End of Term Expectations. Pupils can…*** |
| **Autumn A – Living Things** | **Autumn B – Materials** | **Seasonal change (Autumn change)** |
| * Explore the natural world around them, make observations and draw pictures of animals and plants.
* Begin to understand the need to respect and care for the natural environment and all living things.
 | * Use all their senses in hands on exploration of natural materials.
* Explore collections of materials with similar and/or different properties.
* Discuss the differences between materials and changes they notice.
 | * Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
* Explore the natural world around them.
* Describe what they see, hear and feel whilst outside.
* Understand the effect of change in seasons on the natural world around them.
* Name the 4 seasons.
* Talk about the differences between materials and changes they notice.
* Explore the natural world around them.
* Describe what they see, hear, and feel whilst outside.
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| **Spring A – Animals and humans** | **Spring B - Plants** | **Seasonal change (Spring change)** |
| * Understand the key features of the life cycle of an animal.
* Explore the natural world around them, make observations and draw pictures of animals and plants.
* Begin to understand the need to respect and care for the natural environment and all living things.
 | * Understand the key features of the life cycle of a plant.
* Plant seeds and care for growing plants.
 | * Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
* Explore the natural world around them.
* Describe what they see, hear and feel whilst outside.
* Understand the effect of change in seasons on the natural world around them.
* Name the 4 seasons.
* Talk about the differences between materials and changes they notice.
* Explore the natural world around them.
* Describe what they see, hear, and feel whilst outside.
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| **Summer A – Earth and Space** | **Summer B – Forces and Magnets** | **Summer B - Seasonal change (Summer change)** |
| * Learn about the solar system and stars.
* Learn about space travel.
* Know what space is.
* Know what planets and stars are.
 | * Explore how things work.
* Explore and talk about different forces they can feel.
 | * Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.
* Explore the natural world around them.
* Describe what they see, hear and feel whilst outside.
* Understand the effect of change in seasons on the natural world around them.
* Name the 4 seasons.
* Talk about the differences between materials and changes they notice.
* Explore the natural world around them.
* Describe what they see, hear, and feel whilst outside.
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| ***Year 1 End of Term Expectations. Pupils can…*** |
| **Autumn A - Materials** | **Autumn B – Forces and Motion** | **Seasonal change (Autumn change)** |
| * Correctly identify and name 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 (see vocabulary appendix for examples) of a variety of everyday materials.
* Compare a variety of everyday materials on the basis of their simple physical properties.
* Group together a variety of everyday materials on the basis of their simple physical properties.
 | * Observe and describe different ways of moving
* Identify similarities and differences between movement of different objects
* Make suggestions about how objects can be made to move
* Explore contact forces (push and pull)
* Explore how objects sink or float
* Know that it is not only ourselves that make things move and ask questions about what is causing movement
 | * Name the 4 seasons and say when in the year they occur
* Observe and describe weather associated with the autumn
* Observe changes across the autumn and winter
* Can describe other features that change throughout the year that are caused by the change in weather e.g. numbers of mini beasts found outside, seed and plant growth, leaves on trees, clothes worn by people, hibernation and migration.
* Explain how day light (from the sun rising to sun setting) length varies across the year (longer in summer, shorter in winter)
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| **Spring A – Animals and humans** | **Seasonal change (Spring change)** |
| * 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.
 | * Name the 4 seasons and say when in the year they occur
* Observe and describe weather associated with the Spring
* Observe changes across the Spring
* Can describe other features that change throughout the year that are caused by the change in weather e.g. numbers of mini beasts found outside, seed and plant growth, leaves on trees, clothes worn by people, hibernation and migration.
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| **Summer A - Plants** | **Summer B - Seasonal change (Summer change)** |
| * Flowering plants have a root, stem, leaves and a flower
* Trees can be deciduous which means the leaves are lost yearly-usually in the autumn
* Trees can be evergreen which means there are always leaves on the tree (leaves are continually replenished throughout the year
* Trees and plants have roots, stems and leaves but plants have a softer stem
* Trees are made of roots, trunk, branches and leaves.
* Grasses and ferns consist entirely of leaves.
* In autumn, the leaves on deciduous trees change colour, fruits and nuts fall to the ground. Farmers can harvest the crops.
* In Spring, birds sing, trees produce leaves and flowers blossom and the landscape changes.
* Trees are examples of plant.
 | * Name the 4 seasons and say when in the year they occur
* Observe and describe weather associated with the Summer
* Observe changes across the Summer
* Can describe other features that change throughout the year that are caused by the change in weather e.g. numbers of mini beasts found outside, seed and plant growth, leaves on trees, clothes worn by people, hibernation and migration.
* Explain how day light (from the sun rising to sun setting) length varies across the year (longer in summer, shorter in winter)
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| ***Year 2 End of Term Expectations. Pupils can…*** |
| **Autumn - Materials** |
| * Identify what properties a material needs for a particular purpose.
* Name the materials from which different objects are made.
* Recognise suitable and unsuitable choices of materials for particular purposes based on physical properties (see vocabulary appendix for examples).
* Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.
* Know that materials can be either man-made or naturally occurring.
* Group objects into man-made or natural categories.
* Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.
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| **Spring A – Animals and Humans** | **Spring B –Living things**  |
| * Notice that animals, including humans, have offspring which grow into adults
* Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)
* Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene
 | * 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.
* Construct a simple food chain that includes humans (e.g. grass, cow, human) with arrows pointing in the correct direction.
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| **Summer A - Plants** | **Summer B - Electricity** |
| * Observe and describe how seeds and bulbs grow into mature plants
* Find out and describe how plants need water, light and suitable temperature to grow and stay healthy
* Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers

Pupils know…Plants can grow from seed or bulbs● Seeds and bulbs germinate and grow into seedlings● Seedlings grow into mature plants● Plants need light, water, space, suitable temperature in order to grow● Some plants grow best in full sun● Some plants grow best in the shade● Some plants need lots of water● Some plants don’t need much water● Some plants grow quicker than others. | * Recognise electricity is a form of energy, used for lighting, heating, making sound and making machines and appliances work.
* Recognise that appliances are devices that run on electricity and they should be used safely (includes, no frayed wires, avoid spillages and keep away from water, not putting objects into sockets
* Compare and describe life in a village that has no electricity with one that has
* Recognise that a circuit is a complete path around which electricity can flow and that circuits contain components like wires, switches and bulbs.
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| ***Year 3 End of Term Expectations. Pupils can…*** |
| **Autumn A - Plants** | **Autumn B – Animals including Humans**  |
| * 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, water, 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 ( wind, animal fur, animals eating them (and excreting them), in water and if the seed pod explodes.)
 | * 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.
* Identify that humans and some other animals have skeletons and muscles for support, protection and movement.
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| **Spring A – Light and Seeing** | **Spring B – Rocks, Fossils and Soil** |
| * Recognise that they need light in order to see things and that dark is the absence of light.
* Understand that light is reflected from surfaces and 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 blocked by an opaque object.
* Find patterns in the way that the size of shadows change.
 | * Name some types of rock and describe the physical features of each.
* Compare and group together kinds of rocks based on their appearance.
* Compare and group together kinds of rocks based on their simple physical properties.
* Name the 3 types of rocks (igneous, sedimentary and metamorphic) and classify based on their appearance and physical properties (e.g. marble is metamorphic because it is hard and smooth)
* Describe how the 3 rock types are formed (the rock cycle)
* Recognise that soils are made from rocks and organic matter.
* Describe in simple terms how fossils are formed when things that have lived are trapped in rock.
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| **Summer A - Forces and Magnets** |
| * Compare how things move on different surfaces.
* Notice that some forces need contact between two objects, but magnetic forces can act at a distance.
* Describe magnets as having two poles.
* Observe how magnets attract or repel each other and attract some materials and not others.
* Predict whether two magnets will attract and repel each other, depending on which poles are facing.

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 |

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| ***Year 4 End of Term Expectations. Pupils can…*** |
| **Autumn A - Living Things** | **Autumn B – Animals including Humans**  |
| * 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.
* Show an understanding that humans can impact on an environment and suggest some solutions.
 | * 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 producers, predators and prey.
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| **Spring A – Materials – states of matter** | **Spring B – Sound and Hearing** |
| * Compare and group materials together, according to whether they are solids, liquids or gases.
* 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 the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.
* Know that all things are made up of particles.
* Know that particles are arranged differently in solids, liquids and gases.
* Name properties of solids, liquids and gases.
 | * Identify how sounds are made, associating some of them with something vibrating.
* Recognise that vibrations from sounds 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 produced it.
* Recognise that sounds get fainter as the distance from the sound source increases.
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| **Summer - Electricity** |
| * Identify common appliances that run on electricity and construct a simple series electrical circuit, identifying and naming its basic parts.
* 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.
* Recognise some common conductors and insulators, and associate metals with being good conductors.
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| ***Year 5 End of Term Expectations. Pupils can…*** |
| **Autumn A - Properties and Changes of Materials** | **Autumn B – Sound and Hearing**  |
| * 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 tests, for the particular uses of everyday 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 of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.
 | * 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 producers, predators and prey.
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| **Spring A – Earth and Space** | **Spring B – Forces** |
| * Name the planets of Our Solar System and understand Our place in Our universe, describe the Sun, Earth, Moon and other planets as approximately spherical bodies.
* Describe the movement of the Earth around the sun in the solar system (a full orbit is 365 days, the Earth spins on its axis every 24 hours).
* Use the idea of the Earth’s rotation to explain day and night and the apparent movement of the sun across the day.
* Describe the movement of the moon relative to the Earth (lunar cycles take 28 days, the lunar cycle and eclipses).
* Describe the movement of the other planets relative to the sun in the solar system (fixed orbits)
* Describe what meteors are, and name other objects in space.
* Explain how ‘The Space Race’ has expanded our scientific knowledge and discuss space travel.
 | * Know the work of Isaac Newton and know that force is measured in Newtons by a Newton Meter.
* Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.
* Identify the effects of air resistance.
* Identify the effects of water resistance.
* Identify the effects of friction acting between moving surfaces.
* Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater affect.
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| **Summer A – Living Things** | **Summer A – Animals including Humans** |
| * 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.
* Know the difference between sexual and asexual reproduction.
 | * Describe the changes as humans develop to old age.
* Work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows.
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| ***Year 6 End of Term Expectations. Pupils can…*** |
| **Autumn A - Living Things - Classifying Organisms** | **Autumn B – Animals and Humans**  |
| * 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.
* Explain what a microorganism is and name some.
* Have a basic understanding of a cell.
* Know that living things can be multicellular or unicellular.
 | * Identify and name the main parts of the human circulatory system.
* 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.
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| **Spring A – Evolution and Inheritance** |
| * State what is meant by the term evolution.
* State the evolution occurs over a long period of time (for multi cellular organisms)
* Recall how fossils are formed.
* Identify why species show variation.
* Explain how animals and plants are adapted to their environment.
* Explain what a habitat is.
* Identify work done by Charles Darwin, Alfred Wallace, Mary Anning and John Edmonstone.
* State the environment humans evolved in.
* Explain how geographical location has resulted in the evolution of a spectrum of skin colours
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| **Summer A – Light**  | **Summer A – Electricity**  |
| * Recognise that light appears to travel in straight lines.
* Understand the idea that light travels in straight lines and 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.
* Identify that light travels in straight lines and use this 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 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.
* Use recognised symbols when representing a simple circuit in a diagram.
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**Working Scientifically at St Augustine’s**

* Science is taught weekly and ‘working scientifically’ is embedded in each topic covered.
* End points are repeated across pairs of year groups for consolidation purposes and to ensure pupils are secure with conducting scientific enquiries and understanding their findings before key transition points within school EYFS-KS1, KS1-LKS2 and LKS2-UKS2.

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| **EYFS** | **Years 1 and 2** | **Years 3 and 4** | **Year 5 and 6** |
| * They answer ‘how’ and ‘why’ questions about their experiences and in response to stories or events.
* They develop their own narratives and explanations by connecting ideas or events.
* Children know about similarities and differences in relation to places, objects, materials and living things.
* They make observations of animals and plants and explain why some things occur, and talk about changes.
 | * Children ask simple questions and recognise that they can be answered in different ways.
* They observe closely, using simple equipment.
* They perform simple tests.
* Children identify and classify objects, animals, materials, natural phenomena etc.
* They use their observations and ideas to suggest answers to questions.
* They gather and recording data to help in answering questions.
* They can say what they have found out and whether this was what they expected.
 | * Children ask relevant questions and use different types of scientific enquiries to answer them.
* They set up simple practical enquiries, comparative and fair tests.
* They make systematic and careful observations and, where appropriate, take accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.
* Gather, record, classify and present data in a variety of ways to help in answering questions.
* Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.
* Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.
* Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.
* Identify differences, similarities or changes related to simple scientific ideas and processes.
* Use straightforward scientific evidence, observations and patterns to answer questions, begin to explain their findings or to support their findings.
 | * Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
* Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
* Record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
* Use test results to make predictions to set up further comparative and fair tests.
* Report and present 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.
* Identify scientific evidence that has been used to support or refute ideas or arguments.
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