

**Our children are receptive, inquisitive learners who, through our Gospel values, have a unique sense of the world.**

**Science Curriculum K&S at St. Teresa’s Catholic Academy – Year 6**

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|  |  | Biology | |  |  | Chemistry | | |  |  | Physics | |  |  |
| Plants | Animals,  including  humans | Living things  & habitats | Evolution and  inheritance | Rocks | Everyday  materials | Properties &  changes of  materials | States of  matter | Light | Sound | Forces and  magnets | Seasonal  changes | Earth and  space | Electricity |
| Yr 1 | X | X |  |  |  | X |  |  |  |  |  | X |  |  |
| Yr 2 | X | X | X |  |  | X |  |  |  |  |  |  |  |  |
| Yr 3 | X | X |  |  | X |  |  |  | X |  | X |  |  |  |
| Yr 4 |  | X | X |  |  |  |  | X |  | X |  |  |  | X |
| Yr 5 |  | X | X |  |  |  | X |  |  |  | X |  | X |  |
| Yr 6 |  | X | X | X |  |  |  |  | X |  |  |  |  | X |

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| NC objective    Pupils should be taught to: |  | Year 6 |  |
| Skills |  | Knowledge |
| **ANIMALS INCLUDING HUMANS** |  |  |  |

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| * Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. | To know the function of a heart, lungs and blood vessels.  To be able to label a heart  To know what happens to our heart beat rate when we exercise  To be able to seek patterns in heart rates and various activities.  To take accurate measures of pulse.  To understand the function of blood | * The heart pumps blood around the body. * Oxygen is breathed into the lungs where it is absorbed by the blood. * Muscles need oxygen to release energy from food to do work. (Oxygen is taken into the blood in the lungs; the heart pumps the blood through blood vessels to the muscles; the muscles take oxygen and nutrients from the blood.) |
| * Recognise the impact of diet, exercise, drugs, and lifestyle on the way their body’s function | To know why we need water  To research diet, drugs and lifestyle and feedback.  To know what constitutes a healthy lifestyle | Smoking and drinking alcohol can be harmful to our health.  • Tobacco can cause short-term effects such as shortness of breath and loss of taste and long term effects such as lung disease and cancer.  • Alcohol can cause short term effects such as addiction and long term effects such as organ damage and cancer  Exercise can removing fatty deposits from the body, tone muscles and reduce fat Increase fitness (ability to do high intensity activities for longer). |
| * Describe the ways in which nutrients and water are transported within animals, including humans | Know how the digestive system breaks down nutrients. | Nutrients, oxygen and carbon dioxide are exchanged via the capillaries. |
| **LIVING THINGS AND HABITATS** | | |
| * Classify living things into broad groups according to observable characteristics and based on similarities and differences. * Give reasons for classifying plants and animals based on specific characteristics. | • To classify something as living or non-living —MRS GREN (Movement, Respiration, Sensitivity, Growth, Reproduction, Excretion and Nutrition)  • To 5 broad groups called kingdoms: plants, animals, fungi, protest and prokaryote.  • To be able to group things (living and non-living) using a classification key and explain why.   * To be able to make a key to classify plants | * Variation exists within a population (and between offspring of some plants) *– NB: this Key Idea is duplicated in Year 6 Evolution and Inheritance.* * Organisms best suited to their environment are more likely to survive long enough to reproduce. * Organisms are best adapted to reproduce are more likely to do so. * Organisms reproduce and offspring have similar characteristic patterns.   Competition exists for resources and mates. |

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| **Evolution and inheritance** | | |
| * Know about evolution and can explain what it is. * Know how fossils can be used to find out about the past. * 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 and that adaptation may lead to evolution- 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 be able to identify scientific evidence that has been used to support or refute ideas or arguments.  To investigate if all siblings of living things are the same (family tree)  To research and investigate how birds or animals have adapted to their environment- camouflage, feet beaks etc.  To know what living things need to survive and how these may differ  To be able to present findings from an enquiry such as how do plants make sure they have enough light or water. | * Evolution means change over time. It is the reason we have so many species on Earth. It happens when there is competition to survive (natural selection) and through differences within a species caused by inheritance and mutations. * Inheritance is when something is passed on to the next generation. Offspring are not identical to their parents and some characteristics are inherited (passed on from parents to off-spring). Other differences are new in offspring—these are called mutations. * Adaptation is the action of a living things changing to suit the environment. If a species is well adapted, it will survive and pass on successful genes to offspring. However, being highly adapted to one specific environment can be detrimental to a species’ survival if there are sudden changes to that environment. * Fossils are **the remains or traces of plants and animals that lived long ago**. ... Most fossils are found in earth that once lay underwater. They usually formed from the hard parts—such as shells or bones—of living things |

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| **Light** |  |  |
| * Recognise that light appears to travel in straight lines. * 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. * 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. * Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. * Know how simple optical instruments work, e.g. periscope, telescope, binoculars, mirror, magnifying glass etc. | To investigate whether light can travel around a corner and justify your answer.  To label an eye and understand how light travels through.  To be able to plan a fair-test; recognising and controlling variables- which material is best at reflecting light? Do shadows have the same shape as the object cast?  Pattern seeking how can we increase a number of reflections  To know how a periscope works  To investigate how much light travels through an object | * Animals see light sources when light travels from the source into their eyes. * Animals see objects when light is reflected off that object and enters their eyes. * Light reflects off all objects (unless they are black). Non shiny surfaces scatter the light, so we don’t see the beam. * Light is a form of energy made up of photons, which allows us to see things. We can see things because light is reflected. * Light travels very quickly, in waves and in straight lines. Light behaves differently depending on what it comes in to contact with. * Opaque—objects reflect all light and make clear dark shadows. * Transparent—objects allow light to pass through and so do not create much shadow. * Translucent—objects scatter light and can create faint shadows. * Light normally travels in straight lines (rays) but when passing through transparent materials such as water and glass, light bends or turns – known as refraction. This is because different materials have different qualities and cause the wavelength of light to change. * Spectrum of light: Light is made of many different colours (white light), known as the spectrum. When light hits an object, some of the colours are absorbed by the object and some are reflected. The enables us to see objects in different colours. * our eyes, which are organs that take in light and images and turn them into impulses that our brain can understand. Light rays bounce off objects and into our eyes, allowing us to see. The amount of light reflected from an object depends on the surface and the colour of the object (smooth, shiny and light colour reflect light best). * Light enters the eye through the pupil. The iris helps the pupil change size depending on how bright the light is. Light then hits the retina at the back of the eye. The retina turns light into signals the brain understands. The optic nerve takes signals from the rods and cones to the brain. The brain sends feedback signals to the lens telling it how to focus so we can see clearly. * Formation of shadows – Light is reflected of an object. The area that the light is therefore unable to reach is called a shadow. * Refraction - Refraction happens when objects slow down the light beam, and it deflect is path (slightly change its direction). Visible light is one part of the electromagnetic spectrum. Within this spectrum there are seven connecting ands of electromagnetic waves. Their properties change as the frequency or wavelength changes |

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| **Electricity** | | |
| * 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. | * To explore circuits * To draw a circuit with symbols * Plan and carry out a fair-test – How will the number of batteries (amounts of Volts) affect the brightness of the bulb? * To be able to plan a fair-test by recognising the control variables - What affects the brightness of a bulb in a circuit? | Electricity is a form of energy. Energy is needed to make things happen.  Electrons are small particles with a negative electric charge  The flow of electrons in a circuit is known as a current. An electric current can only flow when there is a complete circuit. As well as the continuous circulation of charge all around the circuit, there is a net transfer of energy from battery to bulb (or another component)  Batteries store chemical energy and change it to electrical energy.  A cell is the basic unit that produces electricity, and a battery has two or more cells.  A circuit connected in series contains components attached to each other, like holding hands in a circle. Components connected in a parallel circuit are connected across each other.  The current depends on what is connected in the circuit.  The electrical force of a cell or battery is called its electromotive force (e.m.f.). This force, which makes electrons flow around a circuit, is measured in units called volts (V). Each kind of cell has a particular e.m.f. Increasing the battery voltage does two things: it increases the energy supplied to each coulomb (the charge of about 6 million million million electrons) and it also drives the charge around the circuit at a greater rate.  A bulb in the circuit slows down (resists) the flow of electricity. More bulbs, wired in series, will slow down the flow even more so the bulbs become dimmer.  Materials that allow electricity to flow within them are electrical conductors. Insulators are materials that do not allow electricity to flow within them.  Volts and Watts are both related to energy transfers in an electric circuit. Energy is measured in Joules (J). The voltage of a power supply is a measure of the energy it gives to the charge moving around the circuit. One volt (1V) means energy of 1 J for every coulomb) – so a 1.5V battery supplies 1.5J to each coulomb that passes through. Watts is the measure of how quickly a component will transfer energy – so a 60W bulb means that it will transfer 60J in each second. |