St Gregory's Catholic Academy - Science Progression

		Early Years Foundation Stage		Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
		Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Biology	Animals including humans	- Explore the natural world around them, make observations and draw pictures of animals and plants. - 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 the natural world around them. - Describe what they see, hear and feel whilst outside. - Recognise that some environments are different to the one in which they live. - Understand the effect of changing seasons on the natural world around them.	- Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammal - 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	- 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	- 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	- 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	- Describe the changes as humans develop to old age - Describe the key stages in the growth and development of humans. - Recall some of the changes experienced in puberty. - Investigate the gestation periods of other animals in comparison to humans including the length and mass	- Identify and name the main parts of the human circulatory system, and 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
	Living things and their habitats				- Identify the differences between things that are living, dead, and things that have never been alive, using some of the 7 life processes (movement, respiration, sensitivity, growth, reproduction, excretion, nutrition). - Identify that most living things live in habitats to which they are suited. - Explain in simple terms how an animal or plant is suited to its habitat. - Name a variety of plants and animals in their habitats, including micro-habitats. - Explain that different conditions in a habitat and micro habitat can affect the number and type of plants/animals that live there. - Describe how plants and animals depend on each other for food and shelter. - 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.		- Know the 7 life processes of living organisms. - Use the 7 life processes to determine if an organism is living. - Describe similarities and differences between examples of plants and animals. - Know the features of mammals, amphibians, fish, birds, reptiles (vertebrates) and invertebrates. - Group living things in a variety of ways using key characteristics. - Know and explore the work of Carl Linnaeus. - Use classification keys to help group and identify a variety of living things in their local and wider environment. - Use classification keys to name a variety of living things. - Recognise that environments can change, and this can sometimes pose dangers to living things. - Understand that human actions can impact on the environment and suggest some solutions to the issues.	- Know that reproduction is when an animal or plant produces on or more individuals similar to itself. - Explain that sexual reproduction requires both male and female DNA (sex cells) and will produce offspring that are similar, but not identical to the parents. - Explain that asexual reproduction will produce offspring that is identical to the parent and only requires on parent e.g., bulbs, tubers and runners. - Explain the life cycle of a mammal, amphibian, insect and a bird. - Explain the process of metamorphosis using frogs and butterflies as examples. - Describe the differences in the life cycles of a mammal, amphibian, insect and a bird. - Use prior knowledge of parts of a flower to explain the stages involved in the reproduction process (pollination, fertilisation and germination).	- Know that living things can be grouped according to different criteria. - Know that a cell is made up of nucleus, cytoplasm and membrane. - Know that living things can be multicellular or unicellular (bacteria). - Explain in simple terms how the Linnaeus system is used to classify living things. - Explain why we need to group living things. - Explain possible difficulties with classification (penguins and whales). - Know that classification keys are used to group living things based on recognisable characteristics. - Construct a classification key. - Explain what microorganisms are and can name some. - Give examples of some situations where microorganisms can be helpful. - Give examples of some situations where microorganisms can be harmful.

	Plants		-	- 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 plants	- 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.	- Plants contain roots to absorb water and nutrients from the soil - Plant roots also anchor the plant to provide support - Plants contain a stem/ trunk which is responsible for transporting water and nutrients around the plant. - Plants contain flowers which contain the stamen, carpel, petal, ovule, sepal and stem - Plants need light, water, space, suitable temperature in order to grow - The level of nutrients required depends on the type of plant - Insects like bees and wasps transfer the pollen from the male part of a flower to the female part of other flowers - Seeds can also be dispersed by wind, animal fur, animals eating them (and excreting them), in water and if the seed pod explodes - The roots absorb water from the soil, the stem transports it to the leaves, water evaporates from the leaves which causes more water to be absorbed from the soil			
	Evolution & 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.

Physics	Light	- Explore how things work - Explore and talk about different forces they can feel - Talk about the differences between materials and changes they notice - Explore the natural world around them - Learn about the solar system and stars - Learn about space travel - Explore the natural world around them - Name the 4 seasons	▪ Understand the effect of change in seasons on the natural world around them ▪ Describe what they see, hear and feel whilst outside. ▪ Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.			- recognise that they need light in order to see things and that dark is the absence of light - notice that light is reflected from surfaces - 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 changes.			- 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
	Sound					- 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	- Recall the different structures of the ear and the function of each part - Explain how sound waves can be modelled - Describe what happens to a sound wave over time - Calculate the speed of sound in different substances - Explain what an auditory range is - Give examples of animals that have large auditory ranges - Describe how sound can be useful in everyday life	
	Magnets and Forces			- 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		- 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		- 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	

	Electricity				- Electricity is a form of energy, used for lighting, heating, making sound and making machines and appliances work. - Pylons and cables carry electricity through the countryside, some electricity cables in busy cities are buried underground - 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 life in a village that has no electricity - A circuit is a complete path around which electricity can flow - - Circuits contain components like wires, switches and bulbs.		- Electricity is a form of energy, used for lighting, heating, making sound and making machines and appliances work. - Some appliances run on electricity; some plug into the mains electricity and others run on batteries. - An electrical circuit consists of a cell or battery connected to a component using wires. - A series circuit is where all the components of the circuits are joined in one loop. If one part of the loop is incomplete, then the circuit will not work - Names of components include cells, wires, bulbs/ lamps, switches and buzzers - A cell is a single unit, and a battery is a collection of cells - One way to test to see if a circuit is complete is to use a bulb/lamp, if the lamp turns on then the circuit is complete. - Switches open and close circuits. When a switch is open the bulb/lamp will not light up as the series circuit is incomplete. - Wires are made from metals as they are good conductors of electricity e.g., iron, copper and steel - Insulators are materials that do not allow electricity to pass through them easily e.g., plastic, wood, rubber and glass. - - Thomas Edison invented the first practical incandescent light bulb		- Recognise circuit symbols in a simple circuit - identify the simple circuit used in a hand torch - Electric current is measured in amperes, current is a flow of charge - Associate the brightness of a lamp or volume of a buzzer with the potential difference in a circuit - Investigate the brightness of a bulb if the PD is increased or the number of bulbs increased in a series circuit - Investigate how the length of wire affects the brightness of a bulb. - Potential difference is measured in volts - Resistance, measured in ohms, as the ratio of potential difference (p.d.) to current - Differences in resistance between conducting and insulating components (quantitative) - Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects - The idea of electric field, forces acting across the space between objects not in contact

	Earth and Space			- Name the 4 seasons and say when in the year they occur - Observe and describe weather associated with the seasons - Observe changes across the 4 seasons - 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)		- 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		- 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	

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Chemistry	Materials	- 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.	- 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.	- 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.	- Group different kinds of rocks on the basis of appearance and simple physical properties, (see vocabulary appendix for examples). - Compare different kinds of rocks on the basis of appearance and simple physical properties, (see vocabulary appendix for examples). - Name the 3 types of rock. - Describe the features of each rock type. - Describe how each rock type is formed within the rock cycle. - Name some different rocks and categorise them based on physical features. - Understand different uses for different rocks and how they change over time. - Explain simply how a fossil is formed. - Recognise that soils are made from rocks and organic matter, (living and dead) and be introduced to different soil types.	- 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. - Compare and group materials together according to if they are solids, liquids and gases, giving reasons to justify their choices. - Observe that some materials change state when heated or cooled, and are able to give everyday examples of melting and freezing. - Understand that melting and freezing are a state change between solids and liquids. - Measure or research the temperature at which melting and freezing occurs for some materials. - Know that water freezes at 0oc and boils at 100oc. - Understand that condensation is a state change from a gas to a liquid. Understand that evaporation is a state change from liquid to gas. - Understand that boiling and evaporation are the same state change from liquid to gas but at different temperatures. - Know that the speed of evaporation depends on a number of variables including the temperature. - Describe the water cycle. - Identify the parts played by evaporation and condensation in the water cycle.	- 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. - Discuss the suitability of everyday materials for different purposes based on their properties, giving reasons, based on evidence from comparative and fair tests. - Know the difference between reversible and irreversible changes. - Demonstrate that dissolving, mixing and changes of state are reversible changes. - Explain that some changes results 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. - Understand some materials will dissolve in liquid to form a solution. - Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving, and evaporating. - Describe how to recover a substance from a solution.	