St Aidan's Catholic Primary School - Science Knowledge and Progression Map Key
Knowledge (Substantive Knowledge) Skills (Disciplinary Knowledge)

Biology: Animals including Humans						
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Prior Knowledge EYFS: *I can talk about and make observations of the animals that I have seen.* *I can show care and concern for living things and the environment.*	I can classify and name a range of animals by amphibian, reptile, mammal, fish and birds. Amphibians live the first part of their lives in the water and the last part on the land. Reptiles are cold-blooded animals and they lay eggs. Reptiles live on land and in water. All mammals have hair, lungs, are warm blooded and can live on land or in water. Most mammals give birth to live babies. But there are a few mammals who lay eggs. A fish uses its gills to breathe, they have scales and lay soft eggs. Birds lay eggs and have a beak, they all lay eggs but not all birds can fly. I can classify animals by what they eat (carnivore, herbivore and omnivore). An omnivore is an animal that eats animals and plants. Animals that eat only animals (or meat) are called carnivores. Animals that eat only plants are called herbivores.	I can explain the basic stages in a life cycle for animals, (including humans). Animals including humans reproduce when they reach maturity. All animals including humans will eventually die. I can explain why exercise, balanced diet and good hygiene are important for humans. Exercise keeps animals including humans, bodies in good condition and increases survival chances. I can explain what animals and humans need in order to survive. Animals move in order to survive. Different animals move in different ways to help them survive. Animals including humans need air, water, food and shelter to survive.	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. Different animals are adapted to eat different foods. Plants can make their own food using the energy from sunlight, however animals, including humans need to eat in order to stay alive. Humans need to eat different types of food. We can place food into five food groups according to how they help us to stay healthy. • Bread, cereal and potatoes (carbohydrates) • Fruits and vegetables (vitamins and minerals) • Meat and fish (protein) • Milk and dairy (calcium) • Fats and sugars. It is important to eat the right amount of food from each group. We can measure food using	I can identify and name parts of the human digestive system and know the functions of the organs involved. The oesophagus is a muscular tube which moves food from the mouth to the stomach. The stomach is an organ in the digestive system where food is broken down with stomach acid and by being churned around. The small intestine is part of the intestine where nutrients are absorbed into the body. The large intestine is part of the intestine where water is absorbed from remaining waste food. Faeces are formed in the large intestine. I can identify the different types and functions of human teeth. Incisors bites and cuts. Canines tears and rips. Molars grind and premolar hold and crushes. Some people have wisdom teeth but they have no function now.	I can demonstrate how to create a timeline to indicate stages of growth in humans. I can describe the changes as humans develop to old age. Prenatal – cells develop and grow into a foetus inside the mother's uterus. After around 9 months, the baby is born. Infancy – rapid growth and development. Children learn to walk and talk. Childhood – children learn new skills and become more independent. Adolescence – The body starts to change over a few years. The changes occur to enable reproduction during adulthood. Earl adulthood – the human body is at its peak of fitness and strength. Middle adulthood – ability to reproduce decreases. There may be hair loss or hair may turn grey. Late adulthood – leading a healthy lifestyle can help slow down the decline of fitness and health with occurs during this stage. I can describe the changes experienced	I can identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood. The heart is an organ which constantly pumps blood around the circulatory system. The heart pumps blood to the lungs to get oxygen. It then pumps this oxygenated blood around the body. Blood vessels are the tube-like structures that carry blood through the tissues and organs. Veins, arteries and capillaries are the three types of blood vessels. Oxygenated blood has more oxygen, it is pumped from the heart to the rest of the body. Deoxygenated blood is blood where most of the oxygen has already been transferred to the rest of the body. I can recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. Drugs, alcohol and smoking have negative effects on the body. A healthy diet involves eating the right types of nutrients in the right amounts. Regular exercise strengthens muscles including the heart muscle, improves circulation,

St Aidan's Catholic Primary School - Science Knowledge and Progression Map Key
Knowledge (Substantive Knowledge) Skills (Disciplinary Knowledge)

	I can sort by living and non-living things. All living things breathe, eat, grow, move, reproduce and have senses. Non-living things do not eat, grow, breathe, move and reproduce. They do not have senses. I can name the parts of the human body that can be seen and link them to our senses. Our eyes help us to see. Our ears help us to hear. Our nose helps us to smell. Our hands help us to feel and our mouth/tongue helps us to taste.		portions. I can identify that humans and some other animals have skeletons and muscles for support, protection and movement. Humans and many animals have skeletons to support their bodies and protect vital organs. Muscles are connected to bones and move them when they contract. Movable joints connect bones	I can construct and interpret a variety of food chains, identifying producers, predators and prey. A producer is an organism, such as a plant, that produces its own food. A predator is an animal that hunts and eats other animals. Prey is an animal that gets hunted and eaten by another animal. An example of a food chain: grass (producer) ➔slug (prey) ➔frog (predator/ prey) ➔ owl (predator) The arrows in a food chain show the flow of energy.	during puberty. Girls – larynx (voice box grows), hair grows under armpits, skin becomes oilier, breasts grow, gain hair on arms and legs, start to menstruate, pubic hair grows. Boys – larynx (voice box) grows 'Adam's apple', hair grows on chest, pubic hair grows, skin becomes oilier, facial hair grows, hair under armpits grow, gain hair on arms and legs, scrotum, testes and penis develop, become more muscular. Both – grow taller, sweat glands produce more sweat, all parts of the body grow.	increases the amount of oxygen around the body, releases brain chemicals which help you feel calm and relaxed, helps you sleep more easily, and strengthens bones. It can even help to stop us from getting ill. I can describe the ways in which nutrients and water are transported within animals, including humans. Nutrients are found in food and water, once broken down, the nutrients are absorbed into the blood in the small intestine. There are tiny hair-like villi that help this process happen. The nutrients are carried in the blood to the different parts of the body that need them. Water doesn't need breaking down and moves between membranes in the body to arrive in the correct place, again via our blood.
Progression in Vocabulary	*Fish, Reptiles, Mammals, Birds, Amphibians (+ examples of each) Herbivore, Omnivore, Carnivore, Leg, Arm, Elbow, Head, Ear, Nose, Back, Wings, Beak*	*Survival, Water, Air, Food, Adult, Baby, Offspring, Exercise, Hygiene, Balanced Diet*	*Movement, Muscles, Bones, Skull, Nutrition, Skeletons*	*Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine, Canine, Incisor, Molar, Carnivore, Herbivore, Predator, Prey*	*Foetus, Embryo, Womb, Gestation, Prenatal, Infancy, Childhood, adolescence, Early adulthood, Middle adulthood, Late adulthood/ Elderly, Growth, Development, Puberty*	*Circulatory, Heart, Blood Vessels, Veins, Arteries, Oxygenated, Deoxygenated, Valve, Exercise, Respiration*

Please refer back to the previous year's knowledge and vocabulary before starting a topic to assess what the children have retained.

St Aidan's Catholic Primary Primary School - Science Knowledge and Progression
Map Key Knowledge (Substantive Knowledge) Skills (Disciplinary Knowledge)

Biology: Living things and their habitats				
Prior Knowledge	**Year 2**	**Year 4**	**Year 5**	**Year 6**
	I can classify things by living, dead or never lived. Everything is either living, dead or has never been alive. There are 7 characteristics of living things: movement, respiration, sensitivity, growth, reproduction, excretion and nutrition. These can be remembered using the acronym: **MRS GREN**. I can explain how a specific habitat provides for the basic needs of things living there (plants and animals) and can match them to their habitat. Different habitats are suited to different plants and animals i.e. forest, ocean, desert, woodland. Habitats provide for the basic needs of the animals and plants that live there, such as food and shelter. I can name some different sources of food for animals and can explain a simple food chain. A food chain shows how animals get food from plants and other animals. There are different sources of food e.g. crops, plants, trees, meat and milk from animals. Living things depend on each other to survive. I can identify and name animals and plants in their habitats including microhabitats. Mammals, reptiles, amphibians, birds and fish can be found in habitats which	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 can recognise that living things can be grouped in a variety of ways. Living things can be divided into groups based upon their characteristics e.g. vertebrate animals can be put into groups such as fish, amphibians, reptiles, birds, and mammals; and invertebrates into snails and slugs, worms, spiders, and insects. Plants can be grouped into categories such as flowering plants (including grasses) and non-flowering plants, such as ferns and mosses. I can recognise that environments can change and that this can sometimes pose dangers to living things. Environmental change affects different habitats differently. Different organisms are affected differently by environmental change. Human activity significantly affects the environment. Positive impacts - the positive effects of nature reserves, ecologically planned parks, or garden ponds. Negative impacts – negative effects of population and development, litter or deforestation.	I can discuss the life cycle of different living things e.g. mammal, amphibian, insect and bird. A lifecycle is the journey of changes that take place throughout the life of a living thing including birth, growing up and reproduction. The life cycle of a frog (amphibian) • Egg • Tadpole • Tadpole with legs • Young frog • Adult I can explain the differences between different life cycles. A lifecycle is the journey of changes that take place throughout the life of a living thing including birth, growing up and reproduction. Different types of organisms have different lifecycles. I can explain the life process of reproduction in some plants and animals. Humans develop inside their mothers and are dependent on their parents for many years until they are old enough to look after themselves. Amphibians such as frogs are laid in eggs then, once hatched, go through many changes until they become an adult. Some animals, such as butterflies, go through metamorphosis to become an adult. Birds are hatched from eggs and are looked after by their parents until they are able to live independently.	I can describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals. Broad groupings, such as micro-organisms, plants and animals can be subdivided. Animals can be classified into commonly found invertebrates (such as insects, spiders, snails, worms) and vertebrates (fish, amphibians, reptiles, birds and mammals). I can give reasons for classifying plants and animals based on specific characteristics. A classification key is a set of questions about the characteristics of living things. A classification key helps to identify a living thing or decide which group it belongs to by answering questions. 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.

	are suited to them. Microhabitats are small habitats where mini beasts may live (e.g. under a rock, under leaves).			
Progression in Vocabulary	*Living, Dead, Habitat, Energy, Food chain, Predator, Prey, Woodland, Pond, Desert, Urban*	*Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats*	*Mammal, Reproduction, Insect, Amphibian, Bird, Offspring*	*Classification, Vertebrates, Invertebrates, Micro-organisms, Amphibians, Reptiles, Mammals, Insects*

Please refer back to the previous year's sticky knowledge and vocabulary before starting a topic to assess what the children have retained.

Biology: Plants			
Prior Knowledge	**Year 1**	**Year 2**	**Year 3**
	Prior Knowledge EYFS: *I can talk about and make observations of the plants that I have seen.* I can name a variety of common wild and garden plants, including deciduous and evergreen trees. A wild plant seed grows where it falls. It doesn't need to be planted or cared for as it grows. Garden plants are plants that people choose to grow in their gardens. A deciduous tree loses its leaves each year. An evergreen tree keeps its green leaves all year round, even in the winter. I can name the petal, stem, leaves and root of a plant and name the roots, trunk, branches and leaves of a tree. Roots take in water and nutrients from the soil and keep the plant in the ground. The stem holds the plant up and	I can explain how seeds and bulbs grow into plants and know what plants need in order to grow and stay healthy. Plants are living things that use sunlight to make their own food. Every plant needs water to grow and survive. Plants need sunlight to grow well. All plants need the right temperature to grow well. Seeds and bulbs can germinate and sprout underground without sunlight because they have a store of food inside the bulb/seed.	I can identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. Plants are producers, they make their own food Roots take in water and nutrients from the soil and keep the plant in the ground. The stem holds the plant up and carries the water and nutrients from the roots to the leaves and flowers. Leaves absorb sunlight and carbon dioxide to help the plant to make its own food. Flowers attract insects and birds. 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. Plants need: water, light, nutrients from the soil, air and room to grow. Different plants vary in how much of these things they need e.g. cacti can survive in areas with little water, whereas water lilies need to live in water. Seeds/bulbs require the right conditions to germinate and grow. Seeds contain enough food for the plant's initial growth. I can investigate the way in which water is transported

	carries the water and nutrients from the roots to the leaves and flowers. Leaves catch sunlight to help the plant to make its own food. Flowers attract insects and birds. Petals are the colourful part of a flower. Fruit contains the plant's seeds. Seeds and bulbs grow into new plants.		within plants. 1.The roots absorb water from the soil. 2.The stem transports water to the leaves. 3.Water evaporates from the leaves. 4.This evaporation causes more water to be sucked up the stem. I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Flowering plants have specific adaptations which help it to carry out pollination, fertilisation and seed production Seed dispersal improves a plants chances of successful reproduction. Seed dispersal – the fully formed seeds are moved away from the parent plant. Germination – The seed starts to grow. Growing and flowering – The plant grows bigger and forms a flower. Pollination – pollen from the anther lands on the stigma and travels down the style. Fertilisation and seed formation – the pollen joins with an ovule and a seed starts to form.
Progression in Vocabulary	*Deciduous, Evergreen trees, Leaves, Flowers (blossom), Petals, Fruit, Roots, Bulb, Seed, Trunk, Branches, Stem*	*Seeds, Bulbs, Water, Light, Temperature, Growth*	*Air, Light, Water, Nutrients, Soil, Reproduction, Transportation, Dispersal, Pollination, Flower*

Please refer back to the previous year's knowledge and vocabulary before starting a topic to assess what the children have retained.

Biology: Evolution and Inheritance	
Prior Knowledge	**Year 6**
	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. Evolution is the process by which living things gradually change over time. Fossils provide information about living things from 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. Organisms reproduce and offspring have similar characteristic patterns. I can identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

St Aidan's Catholic Primary School - Science Knowledge and Progression Map Key
Knowledge (Substantive Knowledge) Skills (Disciplinary Knowledge)

	Over time the characteristics that are most suited to the environment become increasingly common. Organisms best suited to their environment are more likely to survive long enough to reproduce. Variation exists within a population (and between offspring of some plants). I can research the work of a palaeontologist e.g. Charles Darwin. Charles Darwin went on a voyage as a naturalist on the HMS Beagle. Charles Darwin went to the Galapagos Islands and studied the finches that inhabited the island and found that in different areas of the island finches had different beaks (e.g. shapes and sizes). Charles Darwin is known for his theory of evolution by natural selection – this was recorded in his book, On The Origin of Species.
Progression in Vocabulary	*Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics*

St Aidan's Catholic Primary School - Science Knowledge and Progression Map Key
Knowledge (Substantive Knowledge) Skills (Disciplinary Knowledge)

Chemistry

Prior Knowledge	Year 1 Everyday Materials	Year 2 Use of Everyday Materials	Year 3 Rocks	Year 4 States of Matter	Year 5 Properties and change of materials
	Prior Knowledge EYFS: *I can find similarities, differences, patterns and change.* I can name the materials an object is made from. Objects are things that you can touch or see. Objects are made from different materials. Objects feel and look different based on the material they are made from. I can name everyday materials then use their properties to compare and group them. Some materials that objects are made from are: glass, wood, paper, metal, water, rock and plastic. Some words to describe materials are: shiny, soft, rough, bendy, hard and absorbent.	I can explain how materials can be changed by squashing, bending, twisting and stretching. Materials can be changed by physical force. I can explain how suitable materials are used for various different uses. Suitability means having the properties which are right for a specific purpose, e.g. metal, wood and plastic are all suitable materials for spoons.	I can compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Igneous rock is rock that has been formed from magma or lava. Sedimentary rock is rock that has been formed by layers of sediment being pressed down hard and sticking together, you can see the layers of sediment in the rock. Metamorphic rock is rock that started out as igneous or sedimentary rock but changed due to being exposed to extreme heat or pressure. I can describe in simple terms how fossils are formed when things that have lived are trapped within rock. An animal dies. It gets covered with sediments which eventually become rock. More layers of rock cover it. Only hard parts of the creature remain, e.g. bones, shells and teeth. Over thousands of years, sediment might enter the mould to make a cast fossil. Bones may change to mineral but will stay the same shape. Changes in sea level take place over a long period. As erosion and weathering take place, eventually the fossil becomes exposed. I can recognise that soils are made from rocks and organic matter. Soil is the uppermost layer of the	I can compare and group materials together, according to whether they are solids, liquids or gases. Solids, liquids and gases are described by observable properties. Particles in a solid are close together and cannot move. They can only vibrate. Particles in a liquid are close together but can move around each other easily. Particles in a gas are spread out and can move around very quickly in all directions. 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) Heating causes solids to melt into liquids and liquids evaporate into gases. Cooling causes gases to condense into liquids and liquids to freeze into solids. When water and other liquids reach a certain temperature, they change state into a solid or a gas. The temperatures that these changes happen at are called the boiling, melting or freezing point. I can identify the part played by evaporation and condensation in the water cycle and associate	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. Different materials are used for particular jobs based on their properties: electrical conductivity, flexibility, hardness, insulators, magnetism, solubility, thermal conductivity, transparency. I know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. A solution is made when solid particles are mixed with liquid particles. Materials that will dissolve are known as soluble. Materials that won't dissolve are known as insoluble. A suspension is when the particles don't dissolve. I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Reversible changes, such as mixing and dissolving solids and liquids together, can be reversed by:

			Earth. It is a mixture of different things: minerals (the minerals in soil come from finely broken-down rock), air, water, organic matter (including living and dead plants and animals).	the rate of evaporation with temperature. Condensation and evaporation occur within the water cycle. 1. Water from lakes, puddles, rivers and seas is evaporated by the sun's heat, turning it into water vapour. 2. This water vapour rises, then cools down to form water droplets in clouds (condensation). 3. When the droplets get too heavy, they fall back to the earth as rain, sleet, hail or snow (precipitation).	Sieving - Smaller materials are able to fall through the holes in the sieve, separating them from larger particles. Filtering - The solid particles will get caught in the filter paper but the liquid will be able to get through Evaporating -The liquid changes into a gas, leaving the solid particles behind. 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. Some changes can be reversed, and some cannot. 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. Irreversible changes often result in a new product being made from the old materials (reactants). For example, burning wood produces ash. Mixing vinegar and milk produces casein plastic.
Progression in Vocabulary	*Wood, Plastic, Glass, Paper, Water, Metal, Rock, Hard,*	*Hard, Soft, Stretchy, Stiff, Shiny, Dull, Rough, Smooth, Bendy,*	*Fossils, Soils, Sandstone, Granite, Marble, Pumice, Crystals, Absorbent*	*Solid, Liquid, Gas, Evaporation, Condensation, Particles,*	*Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation,*

St Aidan's Catholic Primary School - Science Knowledge and Progression Map Key
Knowledge (Substantive Knowledge) Skills (Disciplinary Knowledge)

	Soft, Bendy, Rough, Smooth	*Waterproof, Absorbent, Opaque, Transparent, Brick, Paper, Fabrics, Squashing, Bending, Twisting, Stretching Elastic, Foil*		*Temperature, Freezing, Heating*	*Dissolving, Mixing*

Please refer back to the previous year's knowledge and vocabulary before starting a topic to assess what the children have retained.

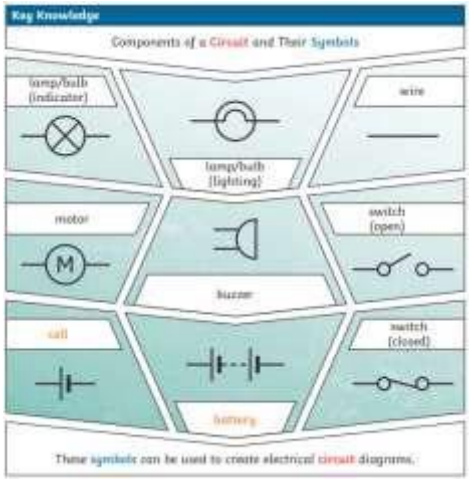
Physics: Light

	Year 3	Year 6
Prior Knowledge	I can recognise that I need light in order to see things and that dark is the absence of light. There must be light for us to see. Without light it is dark. We need light to see things even shiny things. I can notice that light is reflected from surfaces. Beams of light bounce off some materials (reflection). I can recognise that light from the sun can be dangerous and that there are ways to protect their eyes. The pupils control the amount of light entering the eyes. If too much light enters, then it can damage the retina. To help protect the eyes, you can wear a hat with a wide brim and sunglasses with a UV rating. I can recognise that shadows are formed when the light from a light source is blocked by an opaque object. A shadow is caused when light is blocked by an opaque object. A shadow is larger when an object is closer to the light source. This is because it blocks more of the light.	I can recognise that light appears to travel in straight lines. Light travels 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. Light from the sun travels in a straight line and hits an object. The light ray is then reflected off the objects and travels in a straight line to our eyes, enabling us to see the object. 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. We need light to be able to see things. Light waves travel out from sources of light in straight lines. These lines are often called rays or beams of light. 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. A shadow is always the same shape as the object that casts it. This is because when an opaque object is in the path of light travelling from a light source, it will block the light rays that hit it, while the rest of the light can continue travelling.
Progression in Vocabulary	I can find patterns in the way that the size of shadows change. *Light, Shadows, Mirror, Reflective, Dark, Reflection*	*Refraction, Reflection, Light, Spectrum, Rainbow, Colour*

Please refer back to the previous year's knowledge and vocabulary before starting a topic to assess what the children have retained.

St Aidan's Catholic Primary School - Science Knowledge and Progression Map Key
Knowledge (Substantive Knowledge) Skills (Disciplinary Knowledge)

Physics: Electricity

	Year 4	Year 6
Prior Knowledge	I can identify common appliances that run on electricity. A source of electricity (mains or battery) is needed for electrical devices to work. I can construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Electricity sources push electricity round a circuit. Electricity can only flow around a complete circuit that has no gaps. There must be wires connected to both the positive and negative end of the power supply/battery. 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. Electricity can only flow around a complete circuit that has no gaps. There must be wires connected to both the positive and negative end of the power supply/battery. I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. Switches can be used to open or close a circuit. When off, a switch 'breaks' the circuit to stop the flow of electricity. When on, a switch 'completes' the circuit and allows the electricity to flow. I can recognise some common conductors and insulators, and associate metals with being good conductors. A conductor of electricity is a material that will allow electricity to flow through it. Metals are good conductors. Materials that are electrical insulators do not allow electricity to flow through them. Wood, plastic and glass are good insulators.	I can associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. More batteries or a higher voltage create more power to flow through the circuit. Shortening the wires means the electrons have less resistance to flow through. 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. Fewer batteries or a lower voltage give less power to the circuit. More buzzers or bulbs mean the power is shared by more components. Lengthening the wires means the electrons have to travel through more resistance. I can use recognised symbols when representing a simple circuit in a diagram. 
Progression in Vocabulary	*Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators*	*Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators, Amps, Volts, Cell*

Please refer back to the previous year's knowledge and vocabulary before starting a topic to assess what the children have retained.

St Aidan's Catholic Primary School - Science Knowledge and Progression Map Key
Knowledge (Substantive Knowledge) Skills (Disciplinary Knowledge)

Physics: Forces and Magnets		
Prior Knowledge	**Year 3**	**Year 5**
	I can compare how things move on different surfaces. Different surfaces create different amounts of friction. The amount of friction created by an object moving over a surface depends on the roughness of the surface and the object, and the force between them. I can notice that some forces need contact between two objects, but magnetic forces can act at a distance. A force that acts between two surfaces or objects that are moving, or trying to move, across each other. Magnetic force can act at distance. I can observe how magnets attract or repel each other and attract some materials and not others. Magnets produces a magnetic force that pulls certain objects towards it. Objects which are attracted to a magnet are magnetic. Objects containing iron, nickel or cobalt metals are magnetic. 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. Objects which are attracted to a magnet are magnetic. Objects containing iron, nickel or cobalt metals are magnetic. I can describe magnets as having 2 poles. North and south poles are found at different ends of a magnet. I can predict whether two magnets will attract or repel each other, depending on which poles are facing. Repulsion is a force that pushes objects away. For example, when a north pole is placed near the north pole of another magnet, the two poles repel (push away from each other).	I can explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Gravity is a pulling force exerted by the Earth (or anything else which has mass).Earth's gravitational pull is the pull that Earth exerts on an object, pulling it towards Earth's centre. It is the Earth's gravitational pull which keeps us on the ground. 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. Air resistance and water resistance are forces against motion caused by objects having to move air and water out of their way. Friction is a force against motion caused by two surfaces rubbing against each other. I can recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect. Some objects require large forces to make them move; gears, pulley and levers can reduce the force needed to make things move.
Progression in Vocabulary	*Magnetic, Force, Contact, Attract, Repel, Friction, Poles, Push, Pull*	*Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulley*

Please refer back to the previous year's sticky knowledge and vocabulary before starting a topic to assess what the children have retained

St Aidan's Catholic Primary School - Science Knowledge and Progression Map Key
Knowledge (Substantive Knowledge) Skills (Disciplinary Knowledge)

Physics: Sound	
Prior Knowledge	**Year 4**
	I can identify how sounds are made, associating some of them with something vibrating. Sound is a type of energy. Sounds are created by vibrations. The louder the sound, the bigger the vibration. I can recognise that vibrations from sounds travel through a medium to the ear. Inside your ear, the vibrations hit the eardrum and are then passed to the middle and then the inner ear. They are then changed into electrical signals and sent to your brain. Your brain tells you that you are hearing a sound. I can find patterns between the pitch of a sound and features of the object that produced it. Pitch is a measure of how high or low a sound is. A whistle being blown creates a high-pitched sound. A rumble of thunder is an example of a low-pitched sound. I can find patterns between the volume of a sound and the strength of the vibrations that produced it. The size of the vibration is called the amplitude. Louder sounds have a larger amplitude, and quieter sounds have a smaller amplitude. I can recognise that sounds get fainter as the distance from the sound source increases. When sound vibrations spread out over a distance, the sound becomes quieter, just like ripples in a pond.
Progression in Vocabulary	*Volume, Vibration, Wave, Pitch, Tone, Speaker*

Physics: Earth and Space	
Prior Knowledge	**Year 5**
	I can describe the movement of the Earth and other planets relative to the sun in the solar system. 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. Earth rotates (spins) on its axis. It does a full rotation once in every 24 hours. At the same time that Earth is rotating, it is also orbiting (revolving) around the Sun. It takes a little more than 365 days to orbit the Sun. Daytime occurs when the side of Earth is facing towards the Sun. Night occurs when the side of Earth is facing away from the Sun. I can describe the movement of the moon relative to the Earth. The Moon orbits Earth in an oval- shaped path while spinning on its axis. At various times in a month, the Moon appears to be different shapes. This is because as the Moon rotates round Earth, the Sun lights up different parts of it. I can describe the sun, Earth and moon as approximately spherical bodies. The sun, moon and the Earth are astronomical objects shapes like spheres.
Progression in Vocabulary	*Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, Star, Constellation*

St Aidan's Catholic Primary School - Science Knowledge and Progression Map Key
Knowledge (Substantive Knowledge) Skills (Disciplinary Knowledge)

Physics: Seasonal Changes		
Prior Knowledge	**Year 1**	
	I can observe changes across the four seasons. There are four seasons: Spring, Summer, Autumn, Winter. There are lots of different types of weather: rain, sun, cloud, wind, snow, etc. I can observe and describe weather associated with the seasons and how day length varies. Days are longer and hotter in the summer. Days are shorter and colder in the winter	**Progression in Vocabulary**: *Summer, Spring, Autumn, Winter, Sun, Day, Moon, Night, Light, Dark*

Skill progression - Working Scientifically

		Reception	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Working Scientifically	**Asking questions**	Looking at objects and pictures and discussing what they can see. Asks questions about aspects of their familiar world. Generating a variety of ideas for testing (not always realistic/ appropriate). Prediction - Simple guess – what might happen?	To be able to ask simple questions (modelled by teacher). To begin to read and spell scientific vocabulary when asking and answering questions.	To be able to ask simple questions and recognise that they can be answered in different way. To read and spell scientific vocabulary when asking and answering questions.	To be able to make decisions, asking relevant questions. To use scientific vocabulary when asking and answering questions.	To be able to make decisions, asking relevant questions and using different types of scientific enquiries to answer them. To use scientific vocabulary correctly when asking and answering questions.	To be able to plan different types of scientific enquiries to answer questions. To recognise and control variables where necessary. To be able to explore and talk about their ideas. To be able to analyse functions, relationships and interactions.	To be able to plan independently different types of scientific enquiries to answer questions. To independently recognise and control variables where necessary. To be able to explore and talk about their ideas using scientific vocabulary. To ask their own questions about scientific phenomena. To be able to analyse

								functions, relationships and interactions systematically.
	Observing	General sensory observations of animals and plants. Simple descriptions of the world around them.	To observe changes over time and be able to notice patterns in their observations. To understand that we can use observations to help with answering questions. To use simple equipment when observing: magnifying glasses, egg timers, sand timers.	To observe closely changes over time using simple equipment to measure. To recognise patterns and explain their thinking. To perform simple tests and record results from their observations, e.g. Changes over time caterpillar to butterfly.	To set up simple practical enquiries, and begin to understand comparative and fair tests. To work in groups or teacher to model how to make systematic and careful observations using notes and simple tables. To begin to look for naturally occurring patterns and relationships.	To set up simple practical enquiries, comparative and fair tests. To make systematic and careful observations using notes and simple tables. To identify differences, patterns, similarities or changes related to simple scientific ideas and processes.	To begin to identify patterns that might be found in the natural environment. To begin to make decisions about what observations to make, what measurements to use and how long to make them for and whether to repeat them. Begin to interpret data and find patterns.	To identify patterns that might be found in the natural environment. To make independently decisions about what observations to make, what measurements to use and how long to make them for and whether to repeat them. To choose the most appropriate equipment and explain how to use it accurately. To interpret data and find patterns. To be able to make a set of observations and say what the interval and range are.
	Measuring and recording	To measure by direct comparison. To use non-	To know there are different ways to record changes over	To use measuring equipment and	To take accurate measurements using standard units, using a range	To take accurate measurements using standard units, using a	To be able to take measurements, using a range of scientific	To be able to take measurements independently, using a range of

		standard units of measurement. To use simple comparative language e.g. smaller/bigger. To record ideas simply e.g. pictures/images.	time. To explore how to measure and record: whole class charts: bar graphs using multi-link cubes, survey, tables. To begin to understand how science can be used to explain what is occurring. To sort and group in different topics: animals, plants.	record their findings on a chart or simple scale. To use simple scientific equipment including magnifying glasses when measuring and recording. To be able to gather and record data and present it in different ways including on charts, tables and simple graphs. To sort and group in different ways e.g. materials.	of equipment. To gather, record, classify and present data to help in answering questions. To record findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables.	range of equipment, including thermometers and data loggers. To gather, record, classify and present data in a variety of ways to help in answering questions. To record findings using scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	equipment. To take measurements with increasing accuracy To understand why it might be important to take repeat readings when appropriate. To be able to record data and results using scientific diagrams and labels. To show results using classification keys, tables, bar and line graphs.	scientific equipment. To take measurements with increasing accuracy and precision. To take repeat readings when appropriate and begin to account for anomalies. To be able to record data and results of increasing complexity using scientific diagrams and labels. To show results using classification keys, tables, scatter graphs, bar and line graphs.
	Concluding	To simply talk about objects and events.	To know that there are various ways to find answers (modelled by the teacher). To begin to use recording and observations to answer questions (modelled by teacher).	To use simple scientific language when recording their findings. To be able to present and analyse their findings using more sophisticated scientific vocabulary.	To use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. To use straightforward scientific evidence to answer	To report on findings from enquiries, using relevant scientific language, including oral and written explanations, displays or presentations of results and conclusions. To use scientific	To report and present findings and make conclusions from enquiries. To use evidence to justify ideas. To use scientific knowledge and understanding to explain findings.	To draw conclusions based on data and observations. To use scientific knowledge and understanding to explain findings. To identify causal relationships and explanations.

			To be able to make predict ions about what might happen.	To use their observations and ideas to suggest answers to questions. To form predictions about what they think the outcomes of an investigation will be.	questions or to support their findings.	evidence to answer questions and to support their findings.		To recognise 'degree of trust' in result, in oral and written forms.
	Evaluating	To begin to say what went well when they try things out.	To begin to understand the reasons why changes happen. To begin to analyse what has occurred and use scientific vocabulary to describe. .	To be able to use scientific vocabulary when writing a conclusion to a test. To use mostly first-hand experiences (with support) to observe but also begin to use secondary sources: books, photographs, videos.	To reflect on results and begin to suggest improvements and raise further questions. To start to recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	To make predictions for new values, suggest improvements and raise further questions. To recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	To use test results to make predictions. To set up further comparative and fair tests. To recognise that scientific ideas change and develop over time. To identify scientific evidence that has been used to support or refute ideas or arguments.	To use test results and scientific knowledge to make predictions. To set up further comparative and fair tests independently. To independently recognise that scientific ideas change and develop over time. To independently identify scientific evidence that has been used to support or refute ideas or arguments.