

St Sebastian's Science Knowledge Progression

EYFS Science Knowledge		
Understanding the world	3&4-year-olds will be learning to:	Children in reception will be learning to:
	• Explore how things work. • Plant seeds and care for growing plants. • Understand the key features of the life cycle of a plant and an animal. • Begin to understand the need to respect and care for the natural environment and all living things. • Explore and talk about different forces they can feel. • Talk about the differences between materials and changes they notice.	• Explore the natural world around them through the five senses • Observe and interact with natural processes such as ice melting, a sound causing vibration, light travelling through transparent material, an object casting a shadow, a magnet attracting an object and a boat floating on water • Describe what they see, hear and feel whilst outside including plants and animals. • Recognise some environments that are different to the one in which they live e.g. Antarctica • Understand the effect of changing seasons on the natural world around them. e.g. plant growth in summer and lack of food for birds in winter • Know how animals and plants behave differently as the seasons change • Name and describe some plants and animals in their local environment

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Science Content Knowledge – Animals Including Humans

National Curriculum:	Year 1 • 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.					
	Year 2 • 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.					
	Year 3 • 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.					
	Year 4 • 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					
	Year 5 • describe the changes as humans develop to old age					
	Year 6 • 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.					
EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Age 3-4 Know that they need to respect and care for the environment and all living things	Know that a trout is an example of fish, a frog is an example of an amphibian; a lizard is an example of a reptile; a robin is an example of a bird; a rabbit and a human	Know that animals produce offspring that grow into adults. Know that animals, including humans, need food, water and air to survive	Know that proteins are good for growth, carbohydrates for energy and fruit and vegetables provide vitamins and minerals which help keep us healthy (e.g. calcium	Know that food passes through the body with the nutrients being extracted and the waste products excreted, and that	Know that humans go through stages of development; they begin as fertilized eggs and then develop into embryos before developing into babies; once they	Know that the heart and lungs are organs protected by the ribcage Know that in the circulatory system blood travels
Reception						

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Know how to explore the natural world around them through the five senses Know how to describe what they see, hear and feel whilst outside including plants and animals. Know how to name and describe some animals in their local environment	are examples of a mammal Know that herbivorous animals eat plants; a carnivorous animal eats other animals; omnivorous animals eat both animals and plants Know that a cat is an example of a carnivore; that a rabbit is an example of a herbivore; know that many humans are examples of omnivores (though not vegetarians) Know that fish, amphibians, reptiles, birds and mammals are similar in that they have internal skeletons and organs; these are known as vertebrates, which means they are animals that have a backbone Know that fish are different in having gills so that they can	Know the basic food groups: fruit and vegetables, carbohydrates, protein, dairy, fat and sugary foods Know that more than half of our diet should be made up of carbohydrates, fruit and vegetables Know that fats and sugary foods should be eaten rarely and in small amounts Know that people need to exercise often to help their body stay strong and fit Know that keeping clean, including washing and brushing teeth, is an important part of staying healthy	for healthy bones and teeth) Know that getting the right amount of each food group (including over half of the diet made up of fruit, vegetables and carbohydrates) is called a balanced diet Know that lack of a nutrient can cause ill health; for example, a lack of vitamin D leads to a disease called rickets Know that excess of a food group can cause ill health, such as tooth decay due to excess sugar <i>NB – some food groups are difficult to afford for some families so sensitivity is required in teaching this area</i> Know that excess fat from fatty foods such as butter and cheese - and created in the body from excess calories – builds up in	this process is called digestion Know that the process of digestion involves breaking complex foodstuffs into simpler building blocks that can be absorbed by the body Know that the process of digestion begins with food being chewed in the mouth by the teeth and saliva added Know that a human has three types of teeth – incisors, canines and molars – and that these each perform different functions Know that incisors slice food, canines tear food (especially meat) and that molars grind food Know that children develop an initial set of teeth which are gradually replaced between the ages of	are born, these newborn babies become infants (roughly 2 months to 2 years) then into young children (roughly 2-12 years old); children develop into adults during adolescence (roughly 12-16 years old) at which age they become physically capable of reproduction; as adults develop into old age (roughly 55+ years old) they experience changes in their body which require them to move more carefully and rest more frequently <i>(NB: the changes of adolescence in humans is taught as part of mandatory sex and relationship education; it must be taught with due sensitivity to children's family backgrounds; if in doubt, delay sensitive discussions until the formal teaching of sex</i>	(circulates) around the body transporting nutrients that have been absorbed into the blood stream from digestion Know that blood also carries oxygen around the body which is used to power the body; this use of oxygen to create energy is called respiration Know that the heart beats, pumping blood around the body and that blood vessels carry the blood; arteries carry blood away from the heart; veins carry blood towards the heart; capillaries are tiny blood vessels that connect arteries and veins Know that the heart is composed of four chambers: two atria and two ventricles; the aorta is the largest artery in the body and most major
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breathe underwater and scaly skin Know that amphibians are different in that they begin their lives with gills but then develop lungs and breath on land Know that reptiles are different in that they breath air and have scaly skin Know that birds are different to other animals in that they have feathers and wings Know that mammals are different to other animals in that they have fur/hair and they feed milk to their young Know that feet, legs, arms, hands, torso, head, skin, ears, eyes, nose, mouth and tongue are part so the body and identify them		the body and can cause obesity Know that excess body fat can lead to heart disease and increases the strain on joints and growing bones Know that some animals, including humans, have an internal skeleton made up of solid bones. Know that some animals (such as insects) have an exoskeleton – a solid covering on the outside of their body Know that many invertebrates (such as earthworms and slugs) have water held inside by muscles which act like a skeleton Know that skeletons provide support for muscles and protect the body; for example, the ribcage	6 and 12 Know that food is squeezed down the oesophagus towards the stomach in a wave-like action called peristalsis Know that the stomach releases acid and enzymes to continue breaking down the food; the stomach is an organ; an organ is a part of living thing that is self-contained and has a specific important job Know that food then moves into the small intestine which adds more enzymes and bile and then absorbs the nutrients Know that the large intestine absorbs water from the undigested food Know that undigested food is stored in the rectum before being excreted through a muscle called the anus	<i>and relationship education.)</i>	arteries branch off from it Know that when we exercise, our heart beats more frequently so that the oxygen that is used around the body can be replenished; it returns to a resting heart rate afterwards; fitter people tend to have lower resting heart rates Know that drugs are chemicals that have an impact on the natural chemicals in a person's body; know that drugs can be harmful or helpful, depending on what they are and how they are used; know that all drugs can be harmful if overused Know that paracetamol and aspirin are examples of drugs that can be helpful as a painkiller Know that cannabis and cocaine are examples of illegal
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	Know that eyes are associated with sight, ears with hearing, nose with smell, tongue with taste and skin with touch.		protects the vital organs in the human body Know that muscles can only contract, so they must be arranged in pairs in the body so that as one contracts the other relaxes which can allow bones to move.	Know that a food chain traces the path of energy through a habitat Know that all energy for a food chain initially comes from the Sun that is absorbed and turned into energy by plants that are called producers Know that consumers take in energy by eating Know that animal that is eaten by another is called and that an animals that eats other animals is called a predator Know that the arrows in a food chain show the direction that energy is travelling through a habitat		drugs that can have serious negative effects Know that alcohol and tobacco are examples of drugs that are legal to adults but that can have serious negative effects, such as liver disease and lung disease, respectively <i>NB – note that discussion of drugs needs sensitive teaching due to family circumstances</i>
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Science Content Knowledge – Living Things and Their Habitats

National Curriculum:	KS1 Year 2 - 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 micro-habitats - describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.					
	Year 4 - 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 Year 5 - 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. Year 6 - 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 - give reasons for classifying plants and animals based on specific characteristics.					
EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Reception Know how to recognise some environments that are different to the one in which they live e.g. Antarctica		Know that living things move, grow, consume nutrients and reproduce; that dead things used to do these things, but no longer do; and that things that never lived have never done these things. (MRS NERG/GREN – move, reproduce, are sensitive, nutrition, excrete, respire, grow)		Know that animals can be grouped based on their physical characteristics (e.g. vertebrates and invertebrates) and based on their behaviour (e.g. herbivores, carnivores and omnivores) Know that living things are divided	Know that the life cycle of a living thing is a series of stages of development starting with a seed in many plants (review sexual reproduction) but also new plants can be created from just one plant (asexual reproduction) Know that the life cycle of a living thing	Know living things are classified through Carl Linnaeus' classification system according to their similarities and differences and each species has a Latin name Know and describe characteristics of the three types of micro-

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		Know that plants absorb energy from the Sun; that this energy is consumed by herbivorous animals; and that carnivorous animals eat other animals. Know that the arrows on a food chain show the direction that the energy travels. Know some plants and animals that live in an ocean habitat, including a shark, and why. Know some plants and animals that live in a desert habitat, including a cactus, and why. Know how to describe the microhabitat under a log and that woodlice live under logs as they need somewhere dark and damp so that they do not dry out		into kingdoms: the animal kingdom, plants, fungi, bacteria, and single-celled organisms Know that a species is a group of living things which have many similarities and they reproduce together to produce offspring Know that a classification key uses questions to sort and identify different living things and how to use one Know how to create a classification key to sort plants on the school premises Know that changes to the environment can make it more difficult for animals to survive and reproduce; in extreme cases this leads to extinction, where an entire species dies	is a series of stages of development starting with a fertilized egg in animals Know that in most mammals (e.g. dogs) a fertilized egg develops in the womb into an embryo and is then born and fed on milk before it is weaned onto the food that is adapted to eat; it then develops to maturity in a period called adolescence after which it can reproduce and the cycle can begin again Know that in amphibians (e.g. frogs) a fertilized egg develops into an embryo and then hatches into a tadpole; the tadpole develops adult characteristics, metamorphoses into the adult form after which it can reproduce and the cycle can begin again	organism: viruses, fungi and bacteria Know that germs are disease-causing bacteria Know that an arthropod is an invertebrate with a hard, external skeleton and jointed limbs Know that insects are a type of arthropod; their bodies consist of six legs, a head, a thorax and an abdomen; most insects also have a pair of antennae and a pair of wings Know that an arachnid (e.g. spider) is a type of arthropod with eight legs and no antennae or wings Know that a crustacean is a type of arthropod with two pairs of antennae (e.g. crab or woodlouse)
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		Know some plants and animals that live in a pond habitat - which is an example of a microhabitat – and that frogs live in a pond as they need water in which to lay their eggs (frogspawn)		Know that human activity – such as climate change caused by pollution - can change the environment for many living things, endangering their existence Know how to describe a polar habitat; that polar bears are an example of an animal adapted to its environment – thick fur for warmth and oily paw pads to ensure that they don't freeze to the ice. Know that the polar bear is a famous example of climate change endangering the existence of a species; as the climate changes and gets warmer, the sea ice on which polar bears live reduces in amount making it harder for them to survive and reproduce	Know that in many insects (e.g. butterflies) a fertilized egg develops into wingless feeding form called a larva (caterpillar); the larva feeds then later becomes a pupa (chrysalis) with a protective cocoon; inside this cocoon, the pupa metamorphoses into the adult butterfly after which it can reproduce and the cycle can begin again Know that in birds (e.g. robins) a fertilized egg hatches in a nest (a hatchling) and is fed by its parents until it is ready to fly (i.e. becomes a fledgling); it then leaves the nest and grows into an adult after which it can reproduce and the cycle can begin again	Know that a myriapod is an arthropod with a flat and long or cylindrical body and many legs (e.g. centipede) Know how to classify plants and animals based on the above characteristics and be able to explain reasoning
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Science Content Knowledge – Plants						
National Curriculum:	Year 1 - identify and name a variety of common wild and garden plants, including deciduous and evergreen trees - identify and describe the basic structure of a variety of common flowering plants, including trees.					
	Year 2 - observe and describe how seeds and bulbs grow into mature plants - find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.					
	Year 3 - 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					
EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Age 3-4 Know how to plant seeds and care for growing plants Reception Know how to name and describe some plants in their local environment	Know a rose bush, a sunflower and a dandelion by sight Know an oak tree, a birch tree, a horse chestnut tree and a conifer tree by sight Know that evergreen trees maintain their leaves throughout the year and that deciduous trees shed	Know that seeds and bulbs need to be buried underground in soil and that they will grow into adult plants under the right conditions (water, warmth) Know that plants that are deprived of light, food, water or air will not grow and will die.	Know that different parts of plants have one or more functions (jobs) Know that the roots collect water and minerals from the soil, and hold the plant firmly in the ground Know that the stem holds up the leaves so that they can gather			

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	their leaves in autumn Know that a flowering plants consist of roots, stem, leaves and flowers, and that a tree's stem is called a trunk		light to make food and holds up the flowers so that they can receive pollen and disperse their fruits; know that the stem also transports water and minerals from the roots to the other parts of the plant Know that the leaves make food by trapping light and using its energy to turn carbon dioxide and water into food Know that the function of a flower is reproduction, where flowers of the same kind exchange pollen – made by an anther – in a process called fertilisation, and a structure in the flower's ovary called an ovule becomes a seed; the ovary then becomes a fruit which helps the seed leave the plant in a process called dispersal			
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Science Content Knowledge – Materials

National Curriculum:	Year 1 - distinguish between 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 of a variety of everyday materials - compare and group together a variety of everyday materials on the basis of their simple physical properties. Year 2 - identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses - find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.					
	Year 4 – States of Matter - 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					
	Year 5 - 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.					
EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Age 3-4 Know how to explore and talk about different forces they can feel Know how to explore and talk about different materials	Know that an object is made from/of a material Know from observation how to distinguish between materials made of wood, plastic, glass, metal, water, rock	Know that matter is made from tiny building blocks. Know that materials can have useful properties for a given job (including being waterproof, strong,		Know that things are composed of a material in one of three states of matter: solid, liquid or gas Know that things are made of particles (tiny building blocks)	Know that materials can be sorted in a variety of ways based on their properties such as: hardness, solubility, conductivity, transparency and response to magnets	

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Reception Know how to observe and interact with natural processes such as ice melting, a sound causing vibration, light travelling through transparent material, an object casting a shadow, a magnet attracting an object and a boat floating on water	Know that materials can be hard, soft, strong, absorbent, waterproof, heavy, light, solid and runny, smooth and rough; these descriptions denote the properties of a material (see key vocabulary)	hard, soft, flexible, rigid, light or heavy.) Know that many types of plastic are waterproof, that steel (a type of metal) is strong, that rock is hard, that cotton wool is soft, that rubber is flexible, that rock is rigid, that polystyrene (a type of plastic) is light and that iron (a type of metal) is heavy, Know that applying forces to objects can change their shape: squashing, bending, twisting and stretching		and that these are organized differently in different states Know that materials can change state when temperature changes Know that there are bonds between the particles (building blocks) in a solid; as temperature increases, these bonds are somewhat overcome as the particles absorb energy and solids can change into liquids; with a further increase in temperature, the particles become even more energetic and the bonds are overcome entirely so the liquid changes into a gas Know that when solids turn into liquids, this is called melting and that the reverse process is called freezing	Know that in some solid materials the bonds between particles break when surrounded by a liquid; this allows the liquid to absorb the solid; when this happens, the solid is called a solute, the liquid is called a solvent and the result is a solution; when a solid does dissolve in a liquid it is described as being soluble in that solvent (e.g. sugar in water); when it cannot it is insoluble (e.g. sand in water) Know that a given amount of solvent can only absorb a certain amount of solid before no more will dissolve; when this happens the liquid is said to be saturated Know that when a solvent is evaporated from a solution, the original solute is left behind	
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				Know that when liquids turn into gases, this is called evaporation and that the reverse process is called condensation Know that the freezing/melting point of water is 0 degrees C and that the boiling point of water is 100 degrees C. Know that water flows around our world in a continuous process called the water cycle Know that, along with evaporation, water on the Earth's surface moves to the air in a process called transpiration in which water turns into water vapour (gas) on the surface of leaves on plants Know that rain condenses in clouds and falls to earth as rain, snow or hail in a	Know how to dissolve a solute in a solvent and then how to evaporate the solvent to recover the solute Know that a reversible change is one that can be reversed and that examples of this are mixing, dissolving and changes of state where no chemical reaction takes place Know that an irreversible change is one that cannot be reversed and that examples of this often involve a chemical change where a new material is made, often a gas (e.g. burning, boiling an egg, the reaction of bicarbonate of soda and acid) Know that filtering allows solids and liquids to be separated and that sieving allows solids made up of different	
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				process called precipitation Know that water flows across the land in rivers and streams in a process called surface run-off and under the ground as groundwater	sizes parts to be separated Know how to separate a mixture of sand, salt and small stones by sieving (to remove the small stones), followed by dissolving in water (so the salt is absorbed), followed by filtering to remove the sand from the mixture, followed finally by evaporation of the water to recover the salt. Know that materials' different properties can be tested: magnetic, thermally conductive and electrically conductive Know how to use evidence to explain orally and in writing the reasons why various materials are suited or unsuited to a function	
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Science Content Knowledge – Forces and Magnets

National Curriculum:

Year 3

- compare how things move on different surfaces
- notice that some forces need contact between two objects, but magnetic forces can act at a distance
- observe how magnets attract or repel each other and attract some materials and not others
- 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
- describe magnets as having two poles
- predict whether two magnets will attract or repel each other, depending on which poles are facing.

Year 5

- 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, water resistance and friction, that act between moving surfaces
- recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.

EYFS	Y1	Y2	Y3	Y4	Y5	Y6
			Know that a force can be thought of as a push or a pull Know that some forces need direct contact eg pushing a swing or pulling a door open; friction between two surfaces. Know that objects move differently on rough and smooth surfaces; objects resist movement more on rough		Know that the amount of matter (stuff) in an object is its mass Know that unsupported objects are pulled towards the Earth by the force of gravity and its stronger when objects have more mass Know that a force is measured in a unit called Newtons (named after a British	

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			surfaces because there is higher friction as the object moves Know that forces can make things start to move; get faster or slow them down – for example a brake on a bicycle wheel (Year 5 objective). Know that there are also non-contact forces that can act between objects without them touching and that magnetism is an example of a non-contact force Know that magnets have two poles called north and south Know that like poles (south-south and north-north) of two magnets repel each other and that opposite poles of two magnets (north-south) attract each other		scientist called Sir Isaac Newton who discovered lots about gravity and how planets move) Know that pull forces can be measured using a device called a force meter Know that air resistance is a force felt by an object as it moves through the air; it is caused by the object bumping into the gas particles that make up air; the quicker an object moves, the more gas particles it bumps into and the more air resistance it experiences Know that a parachute's shape increases the air resistance that a falling object experiences Know that water resistance is a force felt by an object as it moves through	
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			Know that there is a magnetic field around a magnet which is strongest at each pole Know that some materials are magnetic, meaning that they are attracted to a magnet, while other materials are non-magnetic		water; it is caused by the object bumping into the water particles Know that the shape of an object determines how much air resistance or water resistance it experiences; shapes of objects that experience little air resistance or water resistance are described as streamlined Know how to draw a force diagram with arrows representing the different forces acting on an object Know that a lever is a rigid length pivoting around a fulcrum Know that a pulley is a wheel with a fulcrum that supports a moving cable or belt Know that a gear is a rotating wheel with cut teeth that mesh with the teeth of	
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					another gear so that turning one gear turns an adjacent gear in the opposite direction Know that gears, levers and pulleys are simple machines that used to allow a smaller force to have a greater effect; they do this by moving a smaller force over a longer distance at one end of the machine, which the machine turns into a larger force over a small distance at the other end	
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Science Content Knowledge – Electricity

National Curriculum:	Year 4 • identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • 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 and associate this with whether or not a lamp lights in a simple series circuit • recognise some common conductors and insulators, and associate metals with being good conductors. Year 6 • 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.					
EYFS	Y1	Y2	Y3	Y4	Y5	Y6
				Know that electrical energy is one of many forms of energy Know some common appliances that run on electricity Know that exposure to high levels of electrical current can be dangerous Know that electrical current flows well through some materials, called electrical conductors, and poorly through other materials, called electrical insulators		Know that voltage is a measure of the power of a cell to produce electricity; it is a measure of the 'push' of electric current, not the size of the electric current Know that as the number and voltage of cells in a circuit increases, the brightness of a bulb or the volume of a buzzer will increase (though too high a voltage may 'blow' the bulb or buzzer) Know how to draw simple circuit diagrams - draw the

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				Know that metals are good electrical conductors Know that electrical current can flow if there is a complete circuit Know that wires – which contain a conductor inside them, usually made of metal – can allow electrical current to flow around a circuit Know that when electrical current flows through a circuit, components within that circuit – such as buzzers which make a noise and bulbs which emit light – begin to work Know that a switch functions by completing or breaking a complete circuit Know how to construct a simple series circuit using components		wires in a circuit with a ruler and they should meet at right angles Know the recognized symbols for a battery, bulb, motor, buzzer, switch and wire Know how to predict whether components will function in a given circuit, depending on whether or not the circuit is complete; whether or not a switch is in an on or off position; and whether or not there is a cell to provide electrical current to the circuit Know that two bulbs in a circuit can be wired up to create a series circuit; if one bulb blows in a series circuit the other will not shine as the circuit has been broken
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Science Content Knowledge – Light and Earth and Space

National Curriculum:	Year 3 – Light • 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 change. Year 5 – Earth and Space • describe the movement of the Earth, and other planets, relative to the Sun in the solar system • describe the movement of the Moon relative to the Earth • describe the Sun, Earth and Moon as approximately spherical bodies • use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky Year 6 – 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					
EYFS	Y1	Y2	Y3	Y4	Y5	Y6
			Know that light is a form of energy Know that energy comes in different forms and can be neither created nor destroyed, only changed from one form to another Know that we need light to see things and that darkness is the absence of light		Know that the universe comprises all matter and space in existence Know that a moon is a celestial body that orbits a planet Know that a star is an exceptionally hot ball of gas Know that the Sun is a star	Know how to draw a diagram to help explain how we see things because light travels from light sources to our eyes Know how to draw a diagram to help explain how we see things because light travels from light sources to objects and then to our eyes.

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			Know that light travels in straight lines Know that light is reflected when it travels from a light source and then 'bounces' off an object Know that everything that we can see is either a light source or something that is reflecting light from a light source into our eyes Know that the Sun is a light source, but that the Moon is not and is merely reflecting light from the Sun Know that the Sun and many other light sources give off light and heat Know that sunglasses can protect eyes from sunlight but looking at the Sun directly – even with sunglasses can damage the eyes		Know that a planet (e.g Earth) is defined as a spherical celestial body that orbits a star Know that there are eight major planets in our solar system: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune Know that the Moon orbits the Earth roughly every 28 days Know that Earth orbits the Sun with one orbit being a year which consists of 365/366 days Know that all the planets in the solar system orbit the Sun and that the further away they are from the Sun, the longer their orbit Know that as the Moon orbits the Sun, different parts of it are lit up by the Sun, which is why we see a different shape lit up	Know that when light reflects off an object, the angle of incidence is equal to the angle of reflection Know that a periscope takes advantage of the predictable angles of incidence and reflection to allow an image to be shown to a viewer Know that translucent objects allow some light to pass through, but some of the light changes direction as it passes through the object; this means that something seen through a translucent object is not clearly defined Know how to draw a diagram to show why the shape of a shadow will match the shape of a solid object Know that white light comprises all the
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St Sebastian's Science Knowledge Progression

			Know that opaque objects block light creating shadows and that light passes through transparent objects Know that reflective, opaque and transparent are words to describe the properties of a material Know that as objects move towards a light source, the size of the shadow increases Know how to show the changing of shadow size by drawing a diagram with straight lines representing light		on the Moon as the lunar cycle progresses Know that humans have sent man-made satellites into orbit that assist with telecommunication Know that the Earth spins around an imaginary line through its centre called an axis and that this axis is tilted relative to the Earth's orbit Know that night and day are the result of the Earth rotating on its axis Know that the tilt of the Earth towards and away from the Sun's light as the Earth orbits the Sun leads to the seasons as during winter the light is spread over a wider area Know that a solar eclipse occurs when the Moon is between the Sun and the Earth, casting a shadow on the Earth;	colours of light which is called the spectrum.
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St Sebastian's Science Knowledge Progression

					a lunar eclipse occurs when the Earth is between the Sun and the Moon, casting a shadow on the Moon	
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St Sebastian's Science Knowledge Progression

Science Content Knowledge – Seasonal Change

National Curriculum:	Year 1 - observe changes across the four seasons - observe and describe weather associated with the seasons and how day length varies					
EYFS	Y1	Y2	Y3	Y4	Y5	Y6
Reception Know some effects of changing seasons on the natural world around them. e.g. plant growth in summer and lack of food for birds in winter Know how animals and plants behave differently as the seasons change	Know the names of the four seasons and say which one we are in. Know how weather changes through the year, getting hotter in the summer and colder in the winter Know that the winter is likely to bring ice on the ground when water freezes due to the cold Know that trees change over the seasons Know that days are longer in the summer and shorter in winter					

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Science Content Knowledge – Rocks						
National Curriculum:	Year 3 - compare and group together different kinds of rocks on the basis of their appearance and simple physical properties - describe in simple terms how fossils are formed when things that have lived are trapped within rock - recognise that soils are made from rocks and organic matter					
EYFS	Y1	Y2	Y3	Y4	Y5	Y6
			Know that there are three kinds of rocks: igneous, sedimentary and metamorphic (Links to those found locally in Lincolnshire) Know that the Earth has a solid crust made up of tectonic plates with molten rock beneath Know that granite is a type of igneous rock and that igneous rocks form from molten rock below the Earth's crust Know that limestone and sandstone are types of sedimentary rock which form when small, weathered fragments			

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			of rock or shell settle and stick together, often in layers Know that marble and slate are types of metamorphic rock which form when rocks in the Earth's crust get squashed and heated in processes such as when tectonic plates press against each other Know that fossils form when a plant or animal dies and is quickly covered with silt or mud so that it cannot be rotted by microbes or eaten by scavenging animals; in time, layers of sediment build, squashing the mud and turning it to stone around the dead plant or animal; the materials in the body are replaced by minerals that flow in water through the rock, leaving a rock in the shape of the			
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St Sebastian's Science Knowledge Progression

			animal or plant that was once there			
			Know that soil is made from tiny particles of rock broken down by the action of weather and organic matter (weathering)			

St Sebastian's Science Knowledge Progression

Science Content Knowledge – Sound

National Curriculum:	Year 4 • 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.					
EYFS	Y1	Y2	Y3	Y4	Y5	Y6
				Know that sound is generated when an object vibrates; some of the energy from the vibrating object is transferred to the air, making the air particles move Know that energy comes in different forms and can be neither created nor destroyed, only changed from one form to another Know that sound travels through a medium (e.g. particles in the air) and thus sounds does not travel through a vacuum which has no particles in it at all Know that sound waves are detected in		

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				the ear by humans and that the brain interprets this as the sounds we hear Know that sound travels at different speeds through different objects; it travels much slower than light travels; this is why we often hear thunder after we see lightning as the light reaches our eye before the sound reaches our ears Know that pitch is how high or low a sound is and that this is determined by how many vibrations per second are being made by the vibrating object; the number of vibrations per second is called frequency Know that volume is how loud or quiet a sound is and that this is determined by the amount of energy in the wave (e.g. from how hard or soft a percussion		
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				instrument is hit) Know that the volume of a sound is quieter if the listener is further away from the object		
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Science Content Knowledge – Evolution and Inheritance

National Curriculum:	Year 6 - recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago - 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					
EYFS	Y1	Y2	Y3	Y4	Y5	Y6
						Know that all life on Earth began from a single point around 4.5 billion years ago Know that the gradual change of species over millions of years is called evolution and can be observed by looking at examples of fossils Know that natural selection causes evolution Know how natural selection works: across a species there is natural variation within a species; there is also competition to survive and reproduce and that members of a species with characteristics

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						advantageous to their environment survive and reproduce - these characteristics are passed down to their offspring Know that members of a species with less advantageous characteristics do not survive and reproduce – these characteristics are not passed down to offspring Know a giraffe's neck and the insulating fur on an arctic fox are both examples of evolution/natural selection Know that offspring vary and are not identical to their parents Know that Charles Darwin developed a theory of evolution by natural selection
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