SOUTHAM ST JAMES CofE ACADEMY- SCIENCE LONG TERM PLAN

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
Reception	The focus in Early Years is on beginning to develop an understanding of what science is, on developing the skills of looking closely, and on the language needed to describe what we see. Children will be encouraged t o explore the natural world around them, making observations and drawing pictures of animals and plants. Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.					
Year 1	**The Human Body** Naming parts of the body, the five senses and associated body parts, understanding sensory impairment.	**Animals and their Needs** Living things, naming animals, grouping animals, describing animals, how plants and animals obtain food, offspring, caring for animal babies, caring for pets.	**Seasons and Weather** The four seasons, tools to record the weather, daily weather and weather forecasts, weather symbols, weather around the world, floods and hurricanes.	**Taking Care of the Earth** The Earth's natural resources, conservation of natural resources, logging, recycling, how pollution is caused and can be prevented	**Materials and Magnets** Classification of materials, magnets, magnetic attraction	**Plants** What plants need to grow, the parts and functions of plants, food production, flowers and seeds, deciduous and evergreen.
Knowledge	To identify, name, label and draw the basic parts of the human body. To identify and label parts of our body relating to our senses. I know my senses help me to understand the world around me.	I can name and describe a variety of animals using scientific vocabulary I know that animals can be grouped by their features e.g. whether they are amphibians or mammals I know that animals can be grouped by what they eat e.g. herbivores, omnivores and carnivores I know that there are wild and domestic animals. Domestic animals are animals that we keep as pets and wild animals live freely without regular contact from humans	We have four seasons; spring, summer, autumn and winter. Our weather is warmer during the spring and summer and cooler during the autumn and winter. To know the tools used to gather data about the weather There are different types of cloud and that clouds indicate the weather we are about to experience To recognise weather symbols used in weather forecasting and explain the importance of accurate forecasts	To know that there are natural and man-made resources. Some resources are renewable and some are non-renewable. To know that logging means cutting down trees. To identify some of the ways in which the environment can be polluted and how we can reduce pollution.	Materials have different properties. Magnetism is a force we cannot see. Materials, including magnets, have different uses around the home and in everyday life.	Name and describe the purpose of parts of a plant, and what they need in order to grow. Understand that plants spread their seeds to reproduce. Understand that some trees are evergreen, and some are deciduous. Understand that plants are grown for food and to recognise which parts of plants we eat.

			Meteorologists can study the weather and predict how it will change. Some weather can be dangerous, for example, flooding and hurricanes.			
Year 2	**The Human Body** The skeletal and muscular systems, exercise, digestive system and healthy eating, circulatory system, preventing illness, germs and disease, animals and their offspring**.**	**Living Things in their Environments** Habitats: rainforest, desert, meadow and underground habitats. Food chains, oceans and undersea habitats, deep ocean habitats and habitat destruction and damage.	**Electricity** Circuits, conductive and non-conductive materials, safety rules.	**Plants** Seeds and bulbs, plants and water, light, temperature, healthy plants.	**Materials and Matter** Comparing materials, changing materials, concepts of atoms, matter, solids, liquids, gases, measurements.	**Astronomy** Our solar system, orbit and rotation, sun, moon, planets, stars, constellations
Knowledge	Our bodies, including our muscles and bones, need exercise to stay healthy. Our digestive system takes nutrients from food to help us stay healthy. Keeping clean stops germs from spreading and keeps us healthy**.**	I can name and identify a number of plants and animals, and their habitats I understand that habitats provide for the basic needs of the plants and animals that live there I understand that animals and plants are well suited to their habitats.	Electricity is energy that we can store or use to make things work. An electrical circuit is a wire loop that allows electricity to travel around it	To understand that plants are grown for food. Healthy plants need light and water to grow. Seeds and bulbs grow into mature plants To know there are many different kinds of plants.	The materials used around us have different properties. Solids have a definite shape, we can change the shape of some solids by bending and squashing. Liquids flow freely	To know about the planets in our solar system. To know that Earth travels around the sun. To know that the moon orbits the earth. To be able to describe and name some constellations. To know that scientists explore space.
Year 3	**The Human Body** The digestive system, teeth and senses, a healthy diet, nutrition, vitamins and minerals,	**Rocks** Sorting rocks, how rocks are formed, hardness and permeability, fossils, soil.	**Light** How light travels, shadows, transparent and opaque objects, reflection, mirrors: plane, concave,	**Plants** Functions of plants: roots, stem/trunk, leaves and flowers, Life and growth, variety of plants, water	**Forces and Magnets** Forces, friction, magnets, magnetic poles, magnetic fields, law of magnetic attraction, compasses	**Cycles in Nature** Seasonal cycles and plants, animal migration. Life cycles of a plant and a frog.

	skeletons and muscles for support, protection and movement.		convex, how shadows change throughout the day.	transportation, seed formation and dispersal.		
Knowledge	Cells are the building blocks of the human body and we need nutrition to keep our bodies working as they should. Identify the different types of teeth in humans and their simple functions. To understand how the brain and mouth start the digestive process. To know how food is digested and excreted. To understand the essential vitamins and minerals needed in our body.	Rocks are classified by how they are formed: sedimentary, igneous and metamorphic. Rocks can also be classified by their properties such as whether they are hard or whether they are permeable Fossils are formed over a long period of time from the remains of plants and animals that have died. Soil is a mixture of small pieces of rock with dead organic matter	We need light in order to see things. To know that transparent materials let light through and opaque materials block light from passing through. Mirrors can reflect light in different ways, depending on their shape. Shadows change in size and shape throughout the day.	Flowering plants all have roots, a stem or trunk, leaves and flowers but not all flowering plants look the same. Flowering plants create seeds. Flowering plants can only produce seeds if pollen is transferred. Conditions, including moisture and warmth, must be right for a seed to germinate and grow into a new plant. Plants spread their seeds in a variety of ways.	A force is a push or a pull. Friction is the force between two surfaces. Magnets have an invisible push or pull force. To know that magnets have poles and a magnetic field**.** To know that magnetic forces are not all the same strength. Gravity is a force that causes things to fall to the ground when dropped	To know that our natural environment changes as the seasons change. To understand how plants can change through the seasons. To know that plants grow, live and reproduce. Animals migrate.
Year 4	**The Human Body** The muscular system, the skeletal system, the nervous system, the digestive system, teeth	**Classification of Plants and Animals** Cold-blooded or warm blooded, vertebrates or invertebrates, characteristics of animal classes, classification of plants.	**Sound** How sound is created, how sound travels, sound waves, speed of sound, pitch, intensity, the human voice, hearing, the human ear	**States of Matter and the Water Cycle** Change of state, evaporation, condensation, precipitation, humidity, groundwater	**Electricity** Electric current, circuits, switches, conductors and insulators**.**	**Ecology** Habitats, interdependence of organisms and their environment, producers, consumers and decomposers, food webs, producers, predators and prey, human threats to the environment.
Knowledge	Cells are the building blocks of the human body and we need nutrition to keep our	Understand that we can classify animals and plants.	Sound is caused by a back and forth movement called vibration.	There are three states of matter that water can form: solids, liquids and gases.	Electricity is useful, but it can also be very dangerous. Construct an	Living things depend on their habitats. A producer makes their own food using

	bodies working as they should. Identify the different types of teeth in humans and their simple functions. understand how the brain and mouth start the digestive process. know how food is digested and excreted. understand the essential vitamins and minerals needed in our body.	Fish and amphibians are vertebrates. Features of reptiles, birds and mammals. Reptiles are cold blooded animals. Bird are warm blooded and can fly. Mammals are hairy, warm-blooded vertebrates that breathe air. Understand and describe key features of insects, arachnids and molluscs. Plants can be classified into two main groups: flowering and non-flowering	Sound waves move out from a vibrating object in all directions. In warm air, sound travels at about 770 miles per hour (340 metres per second). Sound becomes quieter further from the source. Loud sounds have larger vibrations. Quiet sounds have smaller vibrations. High pitched sounds have faster vibrations. Low pitched sounds have slower vibrations. The larynx is in the throat and the muscles vibrate the vocal cords.	Water exists in all these states of matter in nature. Water can change into each state in both directions - we call this the Water Cycle. Evaporation occurs when a liquid turns into gas. Condensation occurs when gas turns into liquid (water vapour into liquid water). Precipitation returns water to the surface of the Earth. Water changes state within the water cycle.	electrical circuit. Switches open and close a circuit. Thomas Edison invented the first lightbulb suitable to use in homes. Materials that allow electricity to pass through them are conductors. Materials that do not allow electricity to pass through them are insulators. Many, but not all metals conduct electricity.	sunlight, water and nutrients. A consumer eats other living things to gain their energy. A decomposer breaks down the remains of dead living things into smaller pieces which leaves nutrients in the soil. Living things depend on each other in an ecosystem. Pollution is any substance that is introduced into an environment that can damage or affect quality of life. The 7 life processes are Movement, Reproduction, Sensitivity, Growth, Respiration, Excretion, Nutrition.
Year 5	**Meteorology** Weather and climate, the atmosphere, the Ozone layer, air movement and wind direction, cold and warm fronts, thunder and lightning**.**	**Materials** **Properties-** solubility, conductivity, flexibility, fair testing, solubility, separation of mixtures, reversible changes dissolving, mixing, change of state.	**Living Things** Life cycles of a mammal, an amphibian, an insect and a bird, life process of reproduction in some plants and animals, Photosynthesis, vascular and non-vascular plants**.**	**Forces** Gravity, friction, air resistance, water resistance, pulleys, gears and levers.	**Astronomy** The Big Bang theory, gravity, the Universe, our Solar System, the moon and our galactic neighbourhood.	**The Human Body** Human growth stages, adolescence and puberty, The human reproductive system, The endocrine system.
Knowledge	The atmosphere protects Earth and enables life. Ozone is a gas that absorbs some of the sun's UV radiation.	A property is something that describes a material. Some properties are visible, some can be found by testing.	Plants and animals change throughout the year. A mammal is born and grows into a mature adult.	A force is either a push or a pull. A force can cause an object to increase speed, decrease speed, change	Galaxies are groups of stars held together by gravity. Our galaxy is the Milky Way and our nearest	The first stages of human growth are gestation, birth and Infancy. The human body changes

	Our climate is called a maritime climate, because it is largely influenced by the sea. The polar maritime and the tropical maritime air masses bring wetter weather from the sea. The polar continental and the tropical continental air masses bring drier weather from land. Weather front is a boundary where warm and cold air meet. Thunder and lightning is caused by electrical charge moving through the air.	Thermal conductivity means heat can be transferred through a material A solution is a mixture of a solid in a liquid where the solid has broken into parts too small to see. Mixtures can be separated using sieves, filters and magnetism. Dissolved solids can be regained by evaporation of the solvent. Heating a solution can speed up the process of evaporation. Changes are either reversible or irreversible.	Most amphibians hatch from eggs underwater, before beginning a process of metamorphosis. Metamorphosis is a significant change in an animal as it grows into an adult. Insects and birds have different life cycles. flowering plants need pollen to reproduce. Jane Goodall and David Attenborough have dedicated their lives to studying the natural world and communicating their findings.	direction, change shape. Gravity is a force that pulls objects towards the centre of the earth. Friction gives us grip which allows us to start and stop moving. Air resistance is a kind of friction that slows down objects moving through the air. Water resistance is a kind of friction that slows down objects moving through water. Upthrust is the force that can keep objects afloat. Objects with a large surface area will have greater air resistance than other objects with a small surface area. Simple machines help us to increase the force we apply to an object to help us move it.	neighbour is Andromeda galaxy. Astronomers believe the universe started 14 billion years ago with a Big Bang. Gravity is the force which pulls all objects towards each other. Although all objects attract all others by the force, gravity, it is too weak to notice unless one object (like the Earth) is huge. The Earth's gravity holds us to the Earth's surface; the Sun's gravity holds the Earth in orbit around it. The Sun is at the centre of our solar system. Our solar system contains 8 planets, 4 terrestrial planets and 4 Jovian planets. There are also trillions of smaller rocks called asteroids, as well as dwarf planets like Pluto and Ceres**.** The moon is the Earth's natural satellite. The moon does not make its own light. Depending on the position of the Sun, we see all, part or none of the Moon; these are known as the phases	as it goes through puberty. Hormones are released into the bloodstream during puberty that cause physical, mental and emotional changes. During puberty, muscles and bones grow larger, females develop breasts and their hips widen, males' shoulders widen and their voice deepens.

					of the Moon. Neil Armstrong and Buzz Aldrin were the first humans to land on the moon. The universe is immensely vast. Our solar system is a tiny part of The Milky Way galaxy. The Milky Way's closest neighbour is Andromeda, 2.5 million light years away. Our home supercluster is called Laniakea and contains over 100,000 galaxies.	
Year 6	**The Human Body** The circulatory system, the heart, the blood vessels, the blood, blood pressure and heart rate, changes to humans as we get older.	**Classification of Living Things** Classifying organisms, plant and animal cells, fungi, protists, monera, taxonomy, Latin names, vertebrates	**Electricity** Brightness, buzzers, voltage, switches, simple circuits and symbols	**Light** How light travels, Our eyes, light sources, shadows, periscopes	**Evolution** Fossils, adaptation, characteristics passing through generations, Mary Anning, Alfred Wallace, Charles Darwin, Darwin's sketches of finches.	**Reproduction** Asexual reproduction, sexual reproduction in non-flowering and flowering plants, pollination, fertilisation, reproduction in animals, growth stages**.**
Knowledge	Our heart pumps blood around our body. The left atrium and left ventricle carry oxygenated blood which is pumped around the body. The right atrium and right ventricle carry deoxygenated blood which is pumped out to the lungs.	Living things or organisms are classified into five main kingdoms The members of each kingdom share features that are unique to that group. The five kingdoms are: plants, animals, fungus, protist and prokaryote**.** Cells are the tiny building blocks that	Electricity can flow from one place to another. This is called electrical current. We can control electricity by causing it to flow in a circuit. Circuits can contain components that turn electrical energy into different energy forms, for example a light bulb. Voltage is the pressure from a battery that	Light is a source of illumination that allows us to see. The cornea is a transparent covering on the outside of your eye. The iris is the coloured part of the eye which helps the pupil to 'open and close'. Inside the retina, the light rays become electrical signals which travel along the optic	Fossils are the remains of organisms. A small percentage of life on earth is preserved as a fossil, most organisms decompose. Fossils provide evidence for evolution. Inheritance is passing on characteristics from a parent to their offspring. There are differences in	Asexual reproduction does not require male and female cells. Most flowering plants reproduce by combining a male and female gamete (pollen and ovule) to make a fertilised egg that grows into an embryo.

	All the cells in our body need oxygen. It is delivered to them by the blood. Most arteries carry blood that has been oxygenated in the lungs away from the heart to the cells. Most veins carry deoxygenated blood from the cells back to the heart to be pumped to the lungs for more oxygen. Your heart rate indicates how often your heart squeezes to pump blood through your body. When you exercise, your cells use more oxygen than usual. That is why exercise makes you breathe harder and makes your heart pump faster. Drugs and poor health can affect how well our heart works. Independent variables can be controlled or manipulated. Dependent variables will affect the independent variable. Control variables must be held constant. Red blood cells contain haemoglobin which carries oxygen.	make up all living things. There are two main types of cells: animal and plant cells. Taxonomy is a way of grouping organisms All organisms are placed in one group and then are divided into smaller and smaller groups Organisms are divided into kingdoms, phylum, class, order, family, genus, species All organisms have a scientific name made of the genus and species. Vertebrates are classified into five groups: fish, amphibians, reptiles, birds and mammals. Invertebrates have no backbone. Some groups of invertebrates include molluscs, insects and arachnids. Cnidarian include coral, jellyfish and anemones.	pushes electricity around a circuit. Buzzers and lamps need electricity to make them work. The voltage of a battery, or the number of batteries can change the brightness/ volume of lamps and buzzers. Switches control the flow of electricity in a circuit.	nerve to the brain. Light travels in straight lines. Shadows are always the same shape as the object that made them. The size of shadows can change, but the outline shape is always the same as the original object. Scientists call the light that comes from the sun 'white light'. The light from the sun is made up of all the colours of the rainbow. When light travels through a prism, the glass slows it down, and changes its course. Different colours are slowed down different amounts A periscope uses mirrors to reflect an image of something out of sight. Submarines use periscopes to see.	characteristics within an individual species, known as variation. Evolution is the change in inherited traits. Living things adapt to suit their environment. Animals and plants that adapt well to an environment have more chance of surviving, this is called natural selection.	The embryo or baby plant is protected inside a seed. Most flowering plants clothe their seeds with Fruit. Fruits are seed coverings. Fruit protect and keep seeds moist. Fruits help with seed dispersal. Animals can have male cells (sperm produced in testes) or female cells (eggs produced by ovaries). When an egg is fertilized by sperm it is called a zygote. The zygote develops into an embryo and then a foetus. When a foetus can live outside the mother, it is born**.**

	White blood cells attack and destroy bacteria. The liquid part of blood is called plasma. Platelets help your body to form clots to stop bleeding					