

Topic/Key Concept	Year 3					Year 4						Year 5						Year 6					
	Rocks & Soils	Magnets & Forces	Movement & Feeding	Parts of plants	What plants need	Light & Shadows	Human Nutrition	Electricity	Changes of State	Sound	Dangers to Living Things	Grouping Living Things	Forces	Earth & Space	Materials	Separating materials	Types of Change	Life Cycles	Classifying Living things	Evolution & Inheritance	Changing Circuits	Light & Sight	Our Bodies & Celebration (1 term)
Links to other STEM subject			CS - Creating media - stop frame animation D&T - cooking and nutrition	CS - Date and information branching databases	CS - Creating media Desk Top Publishing									CS - Creating media, video editing				CS - Data and information flat file databases			CS - Crumble to DT - electrical board games	CS - Data and information - spreadsheets	
Key Learning Focus (big picture)	Describe how fossils are formed Group and identify rocks in different ways according to their properties, based on first-hand observation	describe the effects of simple forces that act at a distance (magnetic forces, including those between like and unlike magnetic poles)	name and describe the functions of the main parts of the musculoskeletal system	Accurately name, locate and understand the functions of different parts of a flowering plant	Understand what different plants need to grow and recognise the life cycle of a flowering plant.	Explain the formation and size of shadows	Describe how the human digestive system works. Teeth and how they help with digestion.	Understand how an electrical current flows and basic functions of components of a circuit. The water cycle.	Explaining different states of matter and the physical change that occurs. The water cycle.	Understanding how sound travels through vibrations. The relationship between the volume and pitch of sound and strength of the vibrations.	Learn about the different food chains within our environment. The impact of changes in the environment to the availability of food.	Look at different ways to group living things using classification keys. Compare living things in different environments.	Investigate a variety of forces including gravity, air resistance, water resistance and friction. Explore how simple mechanisms can be used to make work easier.	Describe the movement of Earth, and other planets, relative to the Sun in our Solar System. Describe the movement of the Moon relative to Earth and describe the Sun, Earth and the Moon as approximately spherical bodies. Explain day and night and the apparent movement of the Sun across the sky. Discover how ideas about the solar system have developed and changed over time.	Compare, group and classify everyday materials on the basis of their properties, including their hardness, solubility, transparency, response to magnets and electrical and thermal conductivity. Justify, based on evidence from comparative and fair tests, the particular use of everyday materials, including metals, wood and plastic.	Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.	Understand that dissolving, mixing and changes of state are reversible changes and that burning and heating some materials and mixing bicarbonate with acid are examples of irreversible changes. They will have used evidence gathered from their own and others' investigations relating to dissolving and evaporation to draw conclusions and offer explanations about the behaviour of materials.	Know that plants and animals have life cycles and that reproduction is a part of this cycle. Recognise that each life cycle has distinct stages but that these can vary between species. Understand the importance of reproduction for the survival of a species.	Identify similarities and differences between a wide range of different living things including microorganisms, plants and animals. Use observations to classify living things into broad groups.	Describe how evolution, by means of natural selection/selective breeding, occurs over time. Recognize offsprings are the same type of living thing but that they are not identical to their parents. Justify adaptations in plants and animals for their habitats. Investigate the advantages and disadvantages of living thing features in the real world.	Recognise and use symbols in circuit diagrams correctly. Explain (using analogies) what affects components in a circuit by planning, testing and concluding investigations. Identify and justify links between predictions.	Describe how light travels and that we see things because light travels from light sources to our eyes, or from light sources to objects and then to our eyes. Explain that shiny or reflective surfaces alter the direction in which light travels. Investigate and explain the shapes of shadows, and relate this to light travelling in straight lines.	Recognise and understand how to stay healthy through unpicking the impact of diet, exercise and lifestyle. Investigate the functions of the heart and circulatory system and describe how nutrients and water are transported in human and animal bodies.
National Curriculum Link	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	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.	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.	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.	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.	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.	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.	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. 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.	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.	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.	Recognise that environments can change and that this can sometimes pose dangers to living things.	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.	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.	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.	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. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	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.	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.	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. Describe the changes as humans develop to old age.	Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals. Give reasons for classifying plants and animals based on specific characteristics.	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.	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.	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.	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.
Learning Outcome 1	Sort and classify rocks ws: Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions WS: Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units	Sort objects depending on the forces needed to make them move ws: Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions WS: Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units	Draw and label what a healthy diet is for humans ws: Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions WS: Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units	Name the different parts of a flowering plant and investigate the function of the roots ws: Asking relevant questions and using different types of scientific enquiries to answer them WS: Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units	Explore our school grounds to find where plants grow WS: Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables WS: Using straightforward scientific evidence to answer questions or to support their findings.	Identify sources of light WS: Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	Locate parts of the human digestive system and draw initial ideas of how food is digested.	Identify common appliances that run on electricity.	Compare and group materials together, according to whether they are solids, liquids or gases.	Identify a variety of sounds and how they can be made.	Identify the link between sources of food and animal populations.	Recognise plants and animals and the environments where they live.	Explain and describe why and what makes things move, including the effects of gravity. WS: Identify scientific evidence that has been used to support or refute ideas or arguments.	Explore initial ideas about Earth and space, using reasoning to explain. WS: Ask their own questions about the scientific phenomena that they are studying	Compare and group together everyday materials on the basis of their properties WS: Classify materials using different diagrams and tables	Explore how mixtures can be separated by sieving WS: Take measurements with increasing accuracy. To record results and discuss conclusions and why results may have differed.	Explore prior knowledge about changes of state. Explore dissolving. WS: Take measurements with increasing accuracy. To record results and discuss conclusions and why results may have differed.	Research and draw life cycles. Begin to observe life cycles. WS: Plan different types of scientific enquiries. Take measurements using a range of scientific equipment.	Classify and sort living things into a variety of groups. WS: Identify scientific evidence to support/refute an idea.	Recognise that things change over time through ordering fossils and living things WS: Identify scientific evidence to support/refute an idea.	Demonstrate and explain the importance of symbols in a circuit WS: Record data in increasingly complex scientific diagrams and labels. Identify scientific evidence to support/refute an idea.	Investigate and explain how light travels WS: Record data and results of increasing complexity using scientific diagrams and labels.	Recognise different systems and their functions in the body WS: Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
Learning Outcome 2	Plan and undertake a simple investigation testing the hardness of rocks. ws: Setting up simple practical enquiries, comparative and fair tests	Observe and record how changes in force makes things move WS: Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions ws: Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a	Write a fact file to explain what different animals need to stay healthy	Investigate the function of stems ws: Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units WS: Using straightforward scientific evidence to answer questions or to support their findings.	Investigate what plants need to grow by observing changes over time WS: Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units WS: Identifying differences, similarities or changes related to simple scientific ideas and processes	investigate how shadows are formed. WS: Setting up simple practical enquiries, comparative and fair tests WS: Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	Describe the process of digestion using a flow chart.	Construct and label a simple series circuit.	Describe how materials change state at different temperatures.	Explain how sound travels through vibrations.	Research and create food chains and describe features shared by all food chains.	Group animals according to their features.	Investigate the effects of friction on a moving object. WS: Take measurements, using a range of scientific equipment, Report and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results.	Draw and model the shape and positions of Earth, the Sun and the Moon. WS: Use scientific diagrams and labels. Ask their own questions about the scientific phenomena that they are studying. Notice patterns.	Identify materials that have similar properties. Identify objects that are good electrical conductors. WS: Give reasons, based on evidence for the particular uses of everyday materials, including metals, wood and plastic. Report and present findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results.	Investigate dissolving. WS: Plan different types of scientific enquiries to answer questions, Recording data and results. Report and present findings from enquiries.	Investigate reversible changes including dissolving and separating. WS: Identify scientific evidence that has been used to support or refute ideas or arguments.	Draw a life cycle of a mammal and a bird. Research the work of a scientist. (Jane Goodall) WS: Report and present findings from enquiries.	Use and formulate a classifying diagram WS: Record data in increasingly complex groupings using classification keys. Presenting findings from enquiries.	Summarise how living things inherit features from previous generations WS: Identify scientific evidence to support/refute an idea.	Discover how to alter the brightness of a bulb and explain the reasons for this. WS: Using test results to make predictions to set up further comparative and fair tests	Recognise that light is needed for us to see. WS: Record data and results of increasing complexity using scientific diagrams and labels. Report and present findings from enquiries, including conclusions, causal relationships.	Identify and summarise blood vessels types and what is in blood. WS: Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.

St George's Long Term Science Plan Synopsis

		support their findings.																					
Essential Vocabulary Learnt	rock, stone, pebble, boulder, grain, crystals, layers, hard, soft, texture, absorb water, soil, fossil, marble, chalk, granite, sandstone, slate, soil, peat, sandy/chalk/clay soil	force, push, pull, twist, contact force, non-contact force, magnetic force, magnet, strength, bar magnet, ring magnet, button magnet, horseshoe magnet, attract, repel, magnetic material, metal, iron, steel, poles, north pole, south pole	nutrition, nutrients, carbohydrates, sugars, protein, vitamins, minerals, fibre, fat, water, skeleton, bones, muscles, joints, support, protect, move, skull, ribs, spine	roots, stem/trunk, leaves, flowers, photosynthesis, pollen, pollination, seed formation, seed dispersal, (wind dispersal, animal dispersal, water dispersal)	light, shade, sun, warm, cool, water, grow, healthy, photosynthesis, in sect/wind pollination, seed formation, seed dispersal (wind dispersal, animal dispersal, water dispersal)	light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous	digestive system, digestion, mouth, teeth, saliva, oesophagus, stomach, small intestine, nutrients, large intestine, rectum, anus, teeth, incisor, canine, molar, premolars,	electricity, electrical appliance/device, mains, plug, electrical circuit, complete circuit, component, cell, battery, positive, negative, connect/connectio ns, loose connection, short circuit, crocodile clip, bulb, switch, buzzer, motor, conductor, insulator, metal, non-metal, symbol	solid, liquid, gas, state change, melting, freezing, boiling point, evaporation, temperature, water cycle	sound, source, vibrate, vibration, travel, pitch (high, low), volume, faint, loud, insulation	environment, habitat, human impact, positive, negative, migrate, hibernate	herbivore, carnivore, omnivore, producer, predator, prey, food chain classification keys,	force, gravity, Earth, air resistance, water resistance, friction, mechanisms, simple machines, levers, pulleys, gears	Earth, Sun, Moon, (Mercury, Jupiter, Saturn, Venus, Mars, Uranus, Neptune), spherical, solar system, rotates, star, orbit, planets	thermal/electrical insulator/ conductor, transparent, reflective, opaque, malleability, hardness, rough, smooth, waterproof, magnetic, solubility, absorbcency,	filter, sieve, reversible change mixture, dissolve, solution, soluble, insoluble, dissolving, evaporation, mixing, solid, liquid, gas	changes of state, burning, rusting, irreversible change, irreversible change, chemical change, reversible change	life cycle, reproduce, sexual, sperm, fertilises, egg, live young, metamorphosi s asexual, plantlets, runners, bulbs, cuttings, bird, amphibian, mammal, insect, human.	classification, amphibians, kingdom, birds, invertebrates, insects, vertebrates, flowering, micro-organisms, non-flowering, arachnids, mammals, branching key, reptiles	offspring, environment, inherited, species, fossils, living things, advantages, disadvantages, sexual reproduction, variation, characteristics, suited, adapted,	circuit, complete circuit, circuit diagram, circuit symbol, cell, battery, bulb, buzzer, motor, switch, voltage	light, light source, dark, absence of light, transparent, translucent, opaque, shiny, matt, surface, shadow, reflect, mirror, sunlight, dangerous, light, plus straight lines, light rays	heart, pulse, rate, pumps, blood, blood vessels, transported, lungs, oxygen, carbon dioxide, nutrients, water, muscles, cycle, circulatory system, diet, exercise, drugs, lifestyle
Enrichment for Cultural Capital and Deep Thinking	Top site to visit Science lab Chocolate rocks Walk to the Breck STEM ambassador - meet the rang	Range of investigations involving different magnets home learning - magnetic and non magnetic materials	VR - muscles and skeleton Hi Impact Outdoor learning/home learning -to create your own human skeleton Home learning - photos of pets	Science lab to dissect plant Trip to River Park	Visit top site for plant hunt Home learning – plant a seed and monitor on Google classroom	Outdoor learning - draw around shadows and identify changes throughout the day	Visitor visit from an oral hygienist - Jules Fisher/Kate Morris VR - digestion process in the human body. Scientist - Doris Howes Calloway	Scientist - Nikola Tesla	STEM enrichment: Do all our body parts grow as we get older? Scientist - Brian Cox/ Zoe Laughlin	Scientist - Christine Darden	VR - predator hunting prey Scientist - David Attenborough	Scientist - Aristotle STEM careers - animal welfare/ horticulture.	Trip to Ironbridge - linked to D.T. to look at forces in action - bridge design. Make a simple gear chain.	V.R. Exploring space and the planets. Visit from mobile planetarium. Trip to Liverpool World museum. Family Sky gazing evening.	Visit from a materials scientist.	Dirty water challenge https://practicalaction.org/schools/dirty-the-dirt	Cooking biscuits to look at non reversible change.	Trip to a botanic or zoological garden to experience field study related to life cycles (Chester Zoo) Observing chicks hatch.	Outdoor learning - Forest school bug hunt Habitat building MRS GREN video Baking bread	Hook lesson - build a habitat, fossil skeletons, top trumps, snap cards, menimeter VR - history of the world Outdoor learning - make a fossil iPads - Dog Breeding game	iPads - circuit simulator Lab - equipment Link with DT (fairgrounds)	VR - Light Sources Lab - equipment Making a periscope - WW2 link Link with Computing (crumble)	Heart dissection