Little Eaton Primary School.

Science Progression through Key Stages.

Sc2: Biology Plants:					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
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		Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers			
	Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	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			
	Observe and describe how seeds and bulbs grow into mature plants	Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.			
KEY VOCABULARY					
root, stem, leaf, flower, air, sunlight, water, soil, nutrient, seed, bulb, pollination, petal, fruit, growth, habitat, wild, evergreen, deciduous, branch, trunk, blossom, bud, plant, oak, holly, birch, beech	(As previous Year +) Plants, seeds, bulbs, mature, light, leaves, temperature, healthy, pollen, germinate, reproduce, roots, stem, insects, Sun	(As previous Years +) leaf/leaves, stalk, tip, veins, surface, edge, food, hair, nutrients, anchor, support, germination, seedling, mature plant, nectar, flowering, pollination, seed-formation,			
SCIENTISTS AND INVENTORS					
	Tim Smit build the Eden Project. Jane Colden, Americas first botanist	George Washington Carver developed ways to help farmers keep nutrients in the soil			

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Science Progression through Key Stages.

Sc2: Biology Living Things and their habitats:					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	Explore and compare the differences between things that are living, dead, and things that have never been alive. Identify and name a variety of plants and animals in their habitats, including micro-habitats.		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	Describe the differences in life cycles of a mammal, an amphibian, an insect and a bird	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 special characteristics
	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		Recognise that environments can change and that this can sometimes pose dangers to living things.	Describe the life process of reproduction in some plants and animals	
	Describe how animals obtain their food from plants and other animals, using the idea of a **simple food chain**; identify and name different sources of food.				
KEY VOCABULARY					
	dead, alive, living things, living, plants, animals, habitats, conditions, dry, dark, light, water, damp, micro-habitats, food, prey, predator, producer, food-chain, food-webs, environment, sources, local, protected, species, endangered, birds, fish, reptiles, mammals, amphibians,		(As previous Year +) climate, weather, temperature, classify, humidify, shelter, conditions, adapt, adaptation, species, fish, invertebrate, vertebrate, bird, reptile, mammal, amphibian,	(As previous Years +) vertebrate, invertebrate, carnivore, herbivore, omnivore, life cycle, reproduction, movement, respiration, sensitivity, growth, nutrition, birth, fertilization, germination, pollination, seed, dispersal, predator, prey	(As previous Years +) mammal, reptile, amphibians, habitat, micro-organism, adapt, adaptation, characteristics, classify, fungi, virus, bacteria, movement, respiration, reproduction, growth, nutrition, excretion, sensitivity, vertebrate, invertebrates, species, kingdoms, mosses, ferns, woody and non-woody flowering plants
SCIENTISTS AND INVENTORS					
	Rachel Carson studying Ocean habitats and how pollution is affecting the oceans.		Gerald Durrell: conservation work in Madagascar	David Attenborough: naturalist and animal behaviours. Eva Crane: studied the life cycle of Bees	Libbie Hyman: classified invertebrates.

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Science Progression through Key Stages.

Sc2: Biology Animals, including humans					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals					
Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)					
	Notice that animals, including humans, have offspring which grow into adults			Describe the changes as humans develop to old age. Understand that all living things have lifecycles	
Identify and name a variety of common animals that are carnivores, herbivores and omnivores	Find out and describe the basic needs of animals, including humans, for survival (water, food and air) Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.	Identify that Animals, including humans, 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	Construct and interpret a variety of food chains, identifying producers, predators and prey.		Describe ways in which nutrients and water are transported within Animals, including humans, including humans. Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.		Identify that humans and some other animals have skeletons and muscles for support, protection and movement	Identify the different types of teeth in humans and their simple functions Describe the simple functions of the basic parts of the digestive system in humans		Identify and name the main parts of the circulatory system, and explain the functions of the heart, blood vessels and blood.
KEY VOCABULARY					
bird, amphibian, fish, reptile, mammal, carnivore, herbivore, omnivore, life cycle, nocturnal, skeleton, skull, bone, plus body parts eg: arms, eyes, nose, ears, mouth, human, body, teeth,	(As previous Year +) animal, human, adult, offspring, baby, water, food, air, survival, reproduce, exercise, diet, healthy, hygiene,	(As previous Years +) protein, nutrition, minerals, fats, salts, carbohydrate, vitamins, sugars, balanced diet, spine, vertebrate, invertebrate, muscle, contract, relax, skull, calcium, movement	(As previous Years +) Digestive system, stomach, intestines, oesophagus, gullet, anus, mouth, liver, canine, molar, premolar, incisor, saliva, digest, producer, predator, prey, decay	(As previous Years +) Puberty, life cycle, growth, gestation, sperm, egg, foetus, baby, birth, womb, reproduce, reproduction, sexual reproduction, asexual, fertilization,	(As previous Years +) circulatory system, heart, blood vessel, veins, capillaries, lungs, de-oxygenated, pulse, oxygenated, respiration, ventricle, aorta, atrium, arteries, carbon dioxide, oxygen,
SCIENTISTS AND INVENTORS					
Carl Hagenbeck created the first zoo with open enclosures. George Mottershead created Chester Zoo inspired by Hagenbeck.	Louis Pasteur discovered germs spread through the air, touching and poor hygiene. Elizabeth Garrett Anderson first woman doctor 1865.	Marie Curie developed x-ray machines.	Dr Washington Sheffield: invented the first modern toothpaste in a tube.	Leonardo da Vinci: Vitruvian Man – human proportions	Marie Maynard Daly: worked on understanding cholesterol and sugar in the body. Dr Daniel Hale Williams: performed the first open-heart surgery.

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Science Progression through Key Stages.

Linda Brown Buck: biologist.					

Sc2: Biology	**Evolution & Genetics**				
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
					Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
					Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.
					Identify how Animals, including humans and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.
KEY VOCABULARY					
					Natural selection, breed characteristics, species, evidence, fossils, adapt, adaptation, evolve, parent, offspring, inherited characteristic, inherit, environmental characteristic, environment, breed
SCIENTISTS AND INVENTORS					
					Mary Leakey: work on fossils. Charles Darwin: ideas about natural selection.

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Science Progression through Key Stages.

Sc3: Chemistry Materials:					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Distinguish between an object and the material from which it is made. Identify and name everyday materials, including wood, plastic, glass, metal and rock.	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.			Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.	
Describe the simple physical properties of a variety of everyday materials.	Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.			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.	
			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).	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.	
Compare and group together a variety of everyday materials on the basis of their simple physical properties.			**(States of Matter)** Compare and group materials together, according to whether they are solids, liquids or gases.	Demonstrate that dissolving, mixing and changes of state are reversible changes.	
			Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.		
		(Rocks) Compare and group different types of rocks on the basis of their simple physical properties. Recognise that soils are made from rocks and organic matter. Describe in simple terms how			

		fossils are formed.			
Sc3: Chemistry	**Materials cont'd:**				
KEY VOCABULARY					
materials, properties, wood, plastic, glass, metal, rock, uses, objects, waterproof absorbent, strength structures, brick, paper, elastic, natural, man-made, shiny, dull, smooth, rough, stiff stretchy, opaque, hard, soft transparent,	(As previous Year +) materials, shape, uses, suitability, changes, properties, heat, solid, insulators, conductors, forces, squashing, bending, twisting, flexible, inflexible, stretching, reflective, similarities, differences, wood, metal, plastic, glass, brick, rock, paper, cardboard,	**Rocks:** Waterproof, strong, hard, opaque, heavy, sedimentary, igneous, metamorphic porous, fossil, layers, erosion, soil, mantle, inner core, outer core, crust, earthquake, volcano, pebble, boulder, crystal, weathering	Solid, liquid, gas, state, melting, boiling, evaporation, water cycle, condensation, temperature, thermometer, degrees Celsius (°C)	property, transparent opaque, soluble, insoluble, solute, solution, solvent, conduct, insulate thermal, magnetic, filter, filtrate, state, evaporate, gas, solid, liquid, distillation, chromatography, burning, oxygen, particles	
SCIENTISTS AND INVENTORS					
Ole Kirk Christiansen: invented Lego in 1949.	Charles Macintosh invented the first waterproof fabric.	William Smith made discoveries concerning fossils. Dr Lisa White made discoveries of nanofossils and microfossils. Inge Lehmann discovered what is at the center of the earth.	Antoine Lavoisier, Joseph Priestley: responsible for the discovery of oxygen. Lord Kelvin: discovered the coldest temeperature – absolute zero	CSI Technicians: use if chromatography to separate mixtures. Stephanie Kwolek: developed the use of Kevlar (use in bulletproof clothing)	

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Science Progression through Key Stages.

Sc4: Physics Motion, forces and magnetism:					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		Compare how things move on different surfaces.		Recognise that some mechanisms, including gears, pulleys, levers and springs, allow a smaller force to have a greater effect.	
		Notice that some forces need contact between two objects, but magnetic forces can act at a distance.		Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.	
		Observe how magnets attract or repel each other and attract some materials and not others. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing.			
KEY VOCABULARY					
		force, surface, magnet, magnetic force, attract, repel, magnetic material, poles, iron, bar magnet, horseshoe magnet, materials, contact, non-contact, north pole, south pole, magnetic field, iron filings		Force, newtons, gravity, friction, air resistance, upthrust, balanced, unbalanced, gear, lever, pulley, planet, contact, non-contact, drag, thrust lift, opposite, weight, mass, acceleration, deceleration	
SCIENTISTS AND INVENTORS					
		Christian Orsted / Marie Ampere / Willaim Sturgoen: developed electromagnets			

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Science Progression through Key Stages.

Sc4: Physics Waves: Light					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		Recognise that they need light in order to see things and that dark is the absence of light			Recognise that light appears to travel in straight lines. 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.
		Notice that light is reflected from surfaces			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
		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 a solid object			use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
		Find patterns that determine the size of shadows.			
KEY VOCABULARY					
		light, dark, absence, reflection, surface, natural, man-made, light source, shadow, bright, dim, blocked, mirror, image absorb, plane mirror, concave mirror, convex mirror,			(As Year 3 +) reflect reflection, shadow, light-ray, transmit, opaque, transparent, translucent emit, absorb, dispersion prism, pupil, retina, iris, optic nerve, lens, image, cornea, refraction, mirror, convex, concave
SCIENTISTS AND INVENTORS					
		Arthur James Wilson developed the use of mirrors in cars.			Stephen Hawking: work on Black Hole theory.

Little Eaton Primary School.

Science Progression through Key Stages.

Sc4: Physics Waves: Sound					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
			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.		
KEY VOCABULARY					
			vibration, pitch, sound, wave, volume, frequency, medium, auditory, particle, sound source, ear drum, vibrate, cochlea, hammer, anvil, stirrup, brain, auditory nerve, amplitude, transmit, absorb		
SCIENTISTS AND INVENTORS					
			Alexander Graham Bell: inventor of the telephone		

Little Eaton Primary School.

Science Progression through Key Stages.

Sc4: Physics Electricity:					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
			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.		Use recognised symbols when representing a simple circuit in a diagram.
			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.		Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the 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.		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.
			Recognise some common conductors and insulators, and associate metals with being good conductors.		
KEY VOCABULARY					
			conductor, insulator, metal, plastic, switch, cell, battery, circuit, lamp, electricity, buzzer, brightness, dim, cells, wires, fuse, shock, safety		(As Year 4 +) circuit, component, motor, voltage, function, wire, volume, symbols, series, parallel, graphite,
SCIENTISTS AND INVENTORS					
			Garrett Morgan: invented traffic lights. Maria Telkes: developed alternative power through solar energy		Steve Jobs: use of electronics to design computers.

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Science Progression through Key Stages.

Sc4: Physics Earth & Space					
Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Seasonal changes: Observe changes across the four seasons.					
Observe and describe weather associated with the seasons and how day length varies.				Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	
				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.	
KEY VOCABULARY					
Winter, Summer, Spring, Autumn, temperature, daylight, hours, night, dark, Sun, Earth, Moon, weather, rain, snow, ice, clouds, fog, wind				gravity, star, planet, hemisphere, attract, attraction, weight, moon, orbit, revolve, rotation, axis, equator, season, winter, autumn, mass, solar system, geocentric, heliocentric, sphere, ellipse, phases, shadow, temperature, distance	
SCIENTISTS AND INVENTORS					
George James Symons invented the rain gauge used by meteorologists.				Margaret Hamilton: programmed the Apollo spacecrafts. Neil deGrasse Tyson: classified Pluto as a dwarf planet.	