Lancasterian Primary School

A safe and welcoming learning community where:

- we all aim high;
- everyone is included;
- creativity is valued.

KS1/2 Curriculum Map

SCIENCE

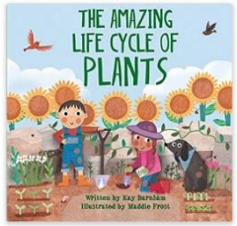
Physics
Chemistry
Biology
Climate Change

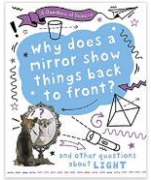
EYFS

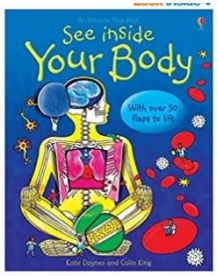
EYFS teach their science curriculum over the year instead of blocked by week like KS1 and KS2. This is spread out through various activities.

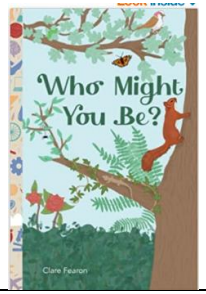
Working Scientifically- Through provision, focus groups and adult support	**Understanding the World**	**Physical Development**	**Expressive Art and Design**	
Observing closely Use simple equipment to help them make observations Discuss what they see touch taste smell or hear	**Living things-Animals** Identify and name the basic parts of the human body Recognise that animals are living things and get their food by eating plants or other animals Identify and name a variety of common woodland, farm and jungle animals and their babies Find out about life cycles of common animals Find out about minibeasts and their habitat	Using simple tools Select and know how to use science tools such as measuring jug, test tube, dropper, tongs thermometer, magnifying glass, tapes	Textures Name and describe the different textures of materials such as hard, rough, bumpy, smooth, soft	**Key Vocabulary:** Science Experiment Scientist Reason Plants Find out Record Why Materials Explain Living things Fair Animals Test Senses Predict
Performing tests Perform a simple test Describe/explain what they have done	**Living things-Plants** Identify and name parts of a flower Recognise that plants are living things Plant seeds and describe what a seed needs to grow	Healthy living Describe what humans need to stay fit and healthy e.g. by eating a variety of healthy food Describe how we keep our bodies fit and healthy e.g. by exercising		**Key Scientists and Inventors:** Dr Maggie Aderin-Pocock Sir David Attenborough Greta Thunberg

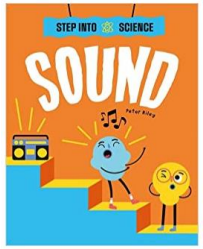
	Take care of our plants and help them to grow			
Identifying and Classifying Think of some questions to ask Answer some scientific questions Give reason for their answer Explain what they have found out	**Materials and their Properties** Identify, name, and sort a variety of everyday materials Compare and group together a variety of everyday materials for a specific purpose e.g. waterproofing Describe and compare what happens when you change states of matter			
Recording findings Show their work using pictures, labels, and captions Record some information on a chart				

	Y1	Y2	Y3	Y4	Y5	Y6
Wk1&2	• Plants – Biology • 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. Suggested Extended Abstract/Greater Depth Task: Identify similarities and differences between various local plants, including their structure **Key vocabulary:** plant, stem, flower, sorting, leaves, root **Key scientists and inventors:** **Mary Seacole** (used plants as remedies for solider during the Crimean war), **Maria Sibylla Merian** (German artist, scientific illustrator, and naturalist)	• Plants – Biology • 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. • • Suggested Extended Abstract/Greater Depth Task: • Some plants live under the water- in ponds or oceans. How are their needs different to those plants that live on land?  • • **Key vocabulary:** • stem, leaf, root, blossom, bulbs, seeds,	• Animals including humans – Biology • **How do living things get energy?** Identify that animal, 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 • **What do we need to eat?** Name the different food groups. Give the sources of the different food groups. Describe the role of different food groups in the body. • **How much food is enough food?** Understand that different people need different amounts of energy. Describe what happens when too much food is consumed. Explain what can happen if too little food is consumed. • **What bones are in the human body?**	• States of matter – Chemistry • **What are states of matter?** Recall some solids, liquids and gases. Group solids, liquids and gases. Describe the properties of solids, liquids and gases. • **Can we turn a solid into a liquid?** Recall the change of state that happens in melting. Give some examples of melting. Investigate melting. • **What is the opposite of melting?** Recall the change of state that happens in freezing. Give some examples of freezing. Investigate freezing. • **Why do puddles disappear?** Recall the change of state that happens in evaporation. Give some examples of	• Forces – Physics • **What happens when friction is low?** Know some everyday examples of forces in action. Describe events when forces are low. Explain how friction can be increased. • **What happens when friction is high?** Know some materials that produce a lot of friction. Describe events where friction is high. Explain how friction can be reduced. • **What is air resistance?** Know what is meant by air resistance. Know how air resistance can be increase. Know how air resistance can be reduced. • **What is water resistance?** Know what is meant by water resistance. Know how water resistance can be	• Light – Physics **How does light travel?** Know how light travels. Explain why light is important. Design and conduct an investigation. **How does reflection help us see?** Know light is reflected when it bounces off an object. Describe how light is reflected off different surfaces. Design and conduct an investigation. **Can we increase reflection?** Know that light travels in a straight line. Explain that reflection helps us see objects. Design and conduct an investigation. **What shapes our shadows?** Recall that light travels in straight lines. Explain why shadows form. Interpret a secondary data source. **What causes rainbows?**

		petals, fruit, germinate, grow, life cycle • • **Key scientists and inventors:** • **George Washington Carver** (Researched farming techniques to keep soil full of nutrients), **Daniel Solander** (Botanist who worked with Joseph Banks on Captain Cook's voyage around the World), **Joseph Banks** (Naturalist on Captain Cook's voyage around the World), **Thomas Wyatt Turner** (Botanist who studied plant disease), • **Poppy Okotcha** • (Horticulturalist interested in the connection between healthy environments, healthy food, and healthier people), **Dr Ben Woodcock** • (Ecological Entomologist who helps farmers grow food, so it is safe for insects and other wildlife), **Angie Burnett** (Plant Biologist who grows plants and sees how they react to different conditions) •	Name the major bones in the human body. Give the function of the major bones in the human body. Describe the structure of bones • **Are human and other animals' bones the same?** Name some animals with and without bones. Know some special types of animal bone structures. Explain what an exoskeleton is • **How do animals move?** Name some muscles and describe the role of muscles in the body. Explain how muscles work at a joint. Suggested Extended Abstract/Greater Depth Task: Create a diet plan for an athlete (with additional nutritional requirements provided) Progression maps **Key vocabulary:** carbohydrates, fats, protein, vitamins, minerals, fibre, obesity, starvation, collagen, exoskeleton, biceps, contract, muscle, tendon, triceps **Key scientists and inventors:** **Dr Stephen Hawking, Wilhelm Roentgen** (Physicist who discovered x-rays), **Marie Curie** (Physicist who invented the first mobile x-ray machine to treat soldiers wounded on the battlefield in WWI),	evaporation. Investigate evaporation. • **Can we make rain?** Recall the change of state that happens in condensation. Give some examples of condensation. Investigate condensation. • **Do we drink the same water as the dinosaurs?** Correctly sequence the stages of the water cycle. Know how to create a model of the water cycle. Describe each stage of the water cycle. Suggested Extended Abstract/Greater Depth Task: True or false: Salt and flour are both liquids because they can be poured? Progression maps **Key vocabulary:** solid, liquid, gas, melting, freezing, evaporation, water vapour, cloud, condensation, fog, precipitation. **Key scientists and inventors:** **Pierre – Gilles de Gennes, Thomas Edison, William Coolidge** (Incandescent lightbulb, tungsten filament), **Anders Celsius** (Celsius measurement of temperature), **Daniel Fahrenheit** (Physicist who invented the Fahrenheit temperature scale and the thermometer)	increased. Know how water resistance can be reduced. • **What is gravity?** Know what is meant by gravity. Give some examples of gravity acting on object. Understand how ideas about gravity have changed over time. • **What are some simple machines?** Know some examples of simple machines. Describe some everyday applications of simple machines. Make a simple machine. Progression maps Suggested Extended Abstract/Greater Depth Task: Identify ways in which friction may be useful (e.g. bicycle handlebar grips) or a nuisance (e.g. bicycle chain) **Key vocabulary:** catapults, grit, newton meter, newtons, trebuchets, synovial fluid, aerodynamics, drag, mechanical engineer, streamlined, marine engineer, mass, clutch, effort, fulcrum, gear, lever, load **Key scientists and inventors:** **Isaac Newton** (Mathematician & Physicist who developed theories about gravity), **Archimedes** (Mathematician who developed theories about	Recall the states of matter. Describe how the speed of light can be changed. Design and conduct an investigation. **Can we make a red apple blue?** Understand that white light is a mixture of colours. Observe that some colours are reflected and some are absorbed. Design and conduct an investigation. Suggested Extended Abstract/Greater Depth Task: Explore similarities and differences between how light and sound travels Progression maps **Key vocabulary:** ray, surgeon, opaque translucent, transparent, periscopes, distort absorb **Key scientists and inventors:** **Lewis Howard Latimer, Euclid** (Mathematician who predicted that light travels in straight lines), **Ibn al-Haytham (Alhazen)** (Physicist & Mathematician who developed a theory that light travels in a straight line and proved it), **Colin Webb** (Professor of Laser Physics) 

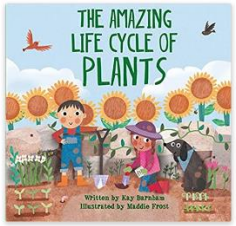
			Adelle Davis (Biochemist & Nutritionist who linked health and diet), **Michelle Williams** (Radiologist), **May Zhu** (dietician) 		how levers and pulleys can lift and move heavy objects), **Galileo Galilei,** (Astronomer, Mathematician & Physicist who was the first person to use the scientific method to test theories about gravity and the Solar System), **George Cayley** (Aeronautical Engineer who designed the first successful glider to carry a human), **Brahmagupta** (Mathematician & Astronomer who was the first scientist to talk about gravity)	
Wk3,4&5	• Animals including humans – Biology • Animals including humans –Biology • 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.	• Living things and their habitats - Biology • 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 microhabitats • Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different	• Rocks – Chemistry • **What are the different types of rocks?** Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties • **How do volcanoes make igneous rocks?** Know what happens in a volcanic eruption. Know how cooling time affects size of crystals. Know some uses of igneous rocks. • **Where can we find fossils?** Know how sedimentary rock is made. Know how fossils are formed. Know examples of sedimentary rocks and their uses. • **Can rocks be changed?** Know some examples of metamorphic rocks. Know the properties of metamorphic rocks. Know	• Sound – Physics • **How are sounds made?** Know how wounds are produced. Understand how different instruments work. Make an instrument • **How does sound travel?** Give examples of different mediums. Describe how an echo is made. Investigate how sound travels through different mediums. • **How do our ears work?** Recall the structure of the ear. Describe the function of the parts of the ear. Explain how sound is detected by the human ear. • **Big or small?** Define the volume of a sound. Describe how volume can be increased. Explain some negative effects of loud sounds. • **High or low?**	• Earth And Space – Physics • **Do objects move in space?** Know the different objects commonly found in space. Know the structure of our solar system. Know what is meant by a year. • **Why do we have day and night?** Know that Earth rotates on its axis. Know what is meant by a day. Explain why the Sun appears to move across the sky. • **Does the moon change?** Know that Moons orbit planets. Know some Moon phase. Describe some uses of artificial satellites. • **Can we use celestial objects to tell the time?**	• Evolution and inheritance – Biology • **What is variation?** Understand that variation refers to differences within a species. Identify that genes and environment contribute to variation. Recognise variation in simple observable traits. • **Why do adaptations matter?** Explain how adaptations aid survival. Describe physical and behavioural adaptations. Explain natural selection. • **What are some animal adaptations?** Identify physical and behavioural animal adaptations. Explain how animal adaptations aid survival. Explore examples of real-world animal adaptations

	Suggested Extended Abstract/Greater Depth Task: Create a list of features (e.g. eyes) which are common across many or all animals **Key vocabulary:** mammals, fish, amphibians, birds, reptiles, sorting **Key scientists and inventors:** **Jane Goodall** (ethologist protecting animals in their natural habitats), **Ilyes El Korbi** (Ukranean refugee climate activist), **Leonardo Da Vinci** (Anatomical drawing, 'Vitruvian Man'), **Miller Hutchinson(**Engineer who invented the first electric hearing aid),**Chester Greenwood** (Inventor of earmuffs), **Maria Sibylla Merian** (German artist, scientific illustrator and naturalist) **Joan Beauchamp Procter** (Herpetologist and Curator of Reptiles, London Zoo), **Patricia Bath** (Ophthalmologist and inventor of using lasers in cataract operations), **Tanesha Allen** (Zoologist who studies badgers)  	Birds nest and large snail shell in science cupboard Suggested Extended Abstract/Greater Depth Task: Explain why there may be a limit as to how many of a certain living thing can live in a particular area **Key vocabulary:** living, dead, herbivore, carnivore, mini-beast, microhabitat, omnivore, ocean, arctic, desert, consumer, producer, predator, prey **Key scientists and inventors:** **Chris Packham** (rewilding), **William Kirby** (Father of modern entomology, the study of insects), **Prem Singh Gill** (Polar Scientist who studies Antarctic seals), **Dawood Qureshi** (Marine Biologist who studies wildlife in the ocean)	how metamorphic rocks are formed. • **Can rocks be recycled?** Know the stages of the rock cycle. Know how to create a model of the rock cycle. Know how to compare the different types of rocks in the rock cycle • **Why is soil important?** Know some different types of soil. Know the different layers of soil. Know how soil structure affects its function. Suggested Extended Abstract/Greater Depth Task: Research and explain how coal is formed Progression maps **Key vocabulary:** crust, meteorites, minerals, granite, mineralogist, porosity, properties, talc, crystal, lava, magma, obsidian, pumice, boulder, continents, fossils, meteorologist, palaeontologist, pebble, sediment, metamorphic, pressure, temperature, bedrock, humus, organic matter, silt, topsoil, waterlogged **Key scientists and inventors:** **Marry Anning (f**ound some of the first dinosaur fossils), **Frederick Mohs** (Mineralogist), **Alfred Wegener** (Astronomer and meteorologist), James Hutton (Geologist), **Adelle Davis** (Biochemist &	Define the pitch of a sound. Describe how pitch can be changed. Explain how ultrasound is used by animals, including humans. • **Can you keep the noise down?** Identify unwanted sounds. Suggest ways to reduce sounds. Investigate ways to reduce unwanted sounds. Suggested Extended Abstract/Greater Depth Task: Compare the effectiveness of different materials in terms of their ability to transmit sound Progression maps **Key vocabulary:** Brass, string, woodwind, vibration, vocal cord, echoes, medium, particle, wave, auditory nerve, audiologist, cochlea, ear canal, eardrum, hearing impairment, pinna, amplifier, decibel, audible range, echolocation, hertz, pitch, sonar, ultrasonography, ultrasound **Key scientists and inventors:** **Christian Doppler (**Creator principle doppler effect – how sound waves travel), **Aristotle** (Philosopher who developed the concept that sound travels through air due to the movement of air particles), **Isaac Newton** (Mathematician & Physicist who measured the speed of sound),	Know that the Sun casts shadows on Earth. Know what a sundial is. Make a model sundial. • **What is the Geocentric model of the solar system?** Know early ideas about the solar system. Know what the Geocentric model is. Know why people accepted the Geocentric model. • **What is the Heliocentric model of the solar system?** Know newer ideas about the solar system. Know what the Heliocentric model is. .Know why the Heliocentric model was accepted. Progression maps Suggested Extended Abstract/Greater Depth Task: True or false: the further out a planet is, the longer its orbit is around the Sun. Justify your answer **Key vocabulary:** Asteroid, celestial bodies, comet, elliptical, galaxy, orbit, sphere, universe, axis, rotation, crescent, phase, satellite, Geocentric, Heliocentric **Key scientists and inventors:** **Dr Maggie Aderin-Pocock** (Space Scientist & TV Presenter), **Mae Jemison** or **Katherine Johnson (**Black	• **How do plants adapt?** Recognise physical adaptations in plants. Explain how adaptations aid plant survival. Explore real-world examples of plant adaptations. • **What can fossils reveal?** Recall what fossils are and how they form. Describe how fossils form. Explore a range of fossil adaptations. • **Who are key figures in evolution?** Recall key scientific thinkers in evolution history. Describe discoveries that shaped evolutionary thinking. Explore evidence that led to theories of adaptation over time. Suggested Extended Abstract/Greater Depth Task: Explain how selective breeding may result in offspring with certain features, e.g. pedigree dogs with a certain shape or colour Progression maps **Key vocabulary:** fossils, offspring, vary, characteristics, DNA, genetics, identical, adapt, environment, evolution, inherit **Key scientists and inventors:** **Meemann Chang** (Paleontologist who studied fish fossils), **Mary Anning**

			Nutritionist who linked health and diet), **Anjana Khatwa** (Geologist who collects rocks and fossils from the beach and studies them to learn about the creatures that lived in the sea and on Earth over 150 million years ago), **Brianna Green** (Biogeochemist who collects soil to see what kind of living things are in it to study the effects of climate change) Light – Physics • **Light source or light reflector?** Know where light comes from. Give examples of light reflectors. Describe what happens in the absence of light • **Transparent, translucent or opaque?** Know that some objects reflect almost all the light. Know that some objects allow some light to pass through. Know that some objects reflect very little light • **What makes a good reflector of light?** Know which types of surfaces reflect light well. Know which type of surfaces do not reflect light well. Know that mirrors are specially designed to reflect as much light as possible. • **What is a shadow?** Know how shadows are formed. Know how to		women in space), **Claudius Ptolemaeus (Ptolemy)** (Astronomer who developed the theory that the Earth was at the centre of the Solar System around which the Sun and other planets orbited), **Nicolaus Copernicus (**Astronomer who developed the theory that the Sun was at the centre of the Solar System around which the planets orbited), **Galileo Galilei** (Astronomer, Mathematician & Physicist who made the first telescope and discovered Neptune and the rings of Saturn) **Johannes Kepler** (Mathematician, Astronomer and Astrologer who developed the theory that the planets moved on oval paths around the Sun), **Helen Sharman** (Astronaut who was the first British citizen to go into space), **Tim Peake** (Astronaut who was the first British person to walk in space)	(Fossil hunter who developed the theory that dinosaurs had become extinct a long time ago), **Charles Darwin** (Natural Historian who developed the theory of evolution by natural selection), **Alfred Wallace** (Natural Historian who developed the theory of evolution by natural selection), **Nettie Stevens** (Geneticist who concluded that sex is inherited as a chromosomal factor and that males determine the gender of offspring), **Emma Dunne** (Palaeobiologist who investigates how ancient climate change affected the evolution of different species)

			change the size of a shadow. Describe patterns in shadow size • **How can we protect our eyes from the sun?** Know what happens to our eyes in bright light. Know what happens to our pupils in dim light. Describe how we can look safely at the Sun. • **How do telescopes work?** Know some ways to help us see better. Know how telescopes work. Know how to make a simple telescope. **Key vocabulary:** absence, bioluminescence, Celsius, mirror, reflect, image, opaque, translucent, transparent, aluminium, dull, scattered, blocked, shadow, position, astronomer, iris, pupil, project, astronaut, binoculars, curved, lens, optician, telescope. **Key scientists and inventors:** Ancient Egyptian astronomers, **Percy Shaw,** (Inventor of the cat's eye.) Suggested Extended Abstract/Greater Depth Task: Explain what happens when there is an eclipse of the sun Progression maps			
Wk6	• Poaching – Climate Change • To explore, research and explain the impact of	• Habitat Loss – Climate Change	• Plastic pollution – Climate Change	• Global warming and extinction rebellion – Climate Change	• Diet/Farming – Climate Change	• Effects of Global warming – Climate Change

	these current affairs on the world and our lives. ***See the separate Environmental curriculum documents in the science folder.*** Suggested Extended Abstract/Greater Depth Task: Debate which animals deserve the most protection **Key vocabulary:** poaching, wild, domestic, climate, environment **Key scientists and inventors:** **Poaching Black Mamba** (all female anti poaching unit in Zimbabwe), **Sir David Attenborough, Greta Thunberg**	• To explore, research and explain the impact of these current affairs on the world and our lives. ***See the separate Environmental curriculum documents in the science folder.*** Suggested Extended Abstract/Greater Depth Task: Explain how we can work out whether habitats are being lost **Key vocabulary:** habitat, climate, deforestation, natural, manmade, danger, survival, varying, environment **Key scientists and inventors:** **Gerald Durrell** (conservationist who worked hard to save Madagascar's unique plants and animals- Deforestation), **Txai Surui** (climate change activist and the founder of the Indigenous Youth movement in her home state of Rondonia in Brazil)	• To explore, research and explain the impact of these current affairs on the world and our lives. ***See the separate Environmental curriculum documents in the science folder.*** Suggested Extended Abstract/Greater Depth Task: Create a product that is usually made from plastic by using an suitable alternative material (suggestions given from teacher for product) **Key vocabulary:** material, synthetic, pollution, transparent, opaque, climate, environment **Key scientists and inventors:** **Boyan Slat** (Inventor of the Ocean Clean up), **Sir David Attenborough, Greta Thunberg, Jane Goodall** (ethologist protecting animals in their natural habitats)	• To explore, research and explain the impact of these current affairs on the world and our lives. ***See the separate Environmental curriculum documents in the science folder.*** Suggested Extended Abstract/Greater Depth Task: Describe why people may be driven to extreme action in order to protest against government inaction on climate change **Key vocabulary:** climate, environment, global, seasonal, temperature, precipitation, climate change, drought, atmosphere, flood, greenhouse gases **Key scientists and inventors:** **Shelia Watt-Cloutier (**Inuit activist against climate change), Kelvin Doe (at the age of 12 used rubbish to build generators, batteries and transmitters), **Dr Rob Chadwick** (looks at changes in the global water cycle related to climate change)	• To explore, research and explain the impact of these current affairs on the world and our lives. ***See the separate Environmental curriculum documents in the science folder.*** Suggested Extended Abstract/Greater Depth Task: Explore the main reasons why reducing and eliminating our meat intake benefits the planet **Key vocabulary:** climate, environment, fertile, agriculture, deforestation, pesticide, climate change **Key scientists and inventors:** **Disha Ravi (**In prisoned after protesting due to water shortages for farmers and flooding in India)	• To explore, research and explain the impact of these current affairs on the world and our lives. ***See the separate Environmental curriculum documents in the science folder.*** Suggested Extended Abstract/Greater Depth Task: Imagine the planet in 2050; what might be different/the same in terms of effects of climate change? Can you design of a building that is adapted to these changes? **Key vocabulary:** climate, environment, global warming, industrialisation, greenhouse gages, temperature, biodiversity, deforestation **Key scientists and inventors:** **Maria Telkes** (worked on solar energy technologies), **William Kamkwamba** (Created and built wind turbines for villages in Africa with no electricity)
Wk7&8	• Everyday Materials – Physics • 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	• Uses of everyday materials – Chemistry • 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	• Forces and Magnets - Physics • **How do we make things move?** Know what a force is Understand how forces can affect objects. Compare how things move on different surfaces Investigate a force in nature	• Electricity – Physics • **What is electricity?** Recall different types of electricity. Know what is meant by electricity. Know how static electricity is made. • **How do we produce electricity for our homes?**	• Properties and changes of materials – Chemistry • **What do we use materials for?** Test material properties. Compare material properties. Assess the suitability of a material for a particular use.	• Living things and their habitats – Biology • **How do we classify animals?** Recall characteristics of animals. Distinguish between vertebrates and invertebrates. Compare characteristics of different vertebrate groups.

	• 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. Suggested Extended Abstract/Greater Depth Task: Compare the same object made from different materials in terms of its effectiveness **Key vocabulary:** materials, objects, metal, plastic, wood, paper, fabric, glass, properties, sorting, soft, rough, bumpy, shiny, transparent, translucent, hard, smooth, opaque, bumpy, stretchy, bendy **Key scientists and inventors:** **Leo Baekeland** (inventor of plastic) , **Becky Schroeder** (Inventor of Glo-sheets which she patented as a 12-year-old), **Chester Greenwood** (Inventor of earmuffs)	some materials can be changed by squashing, bending, twisting and stretching. Suggested Extended Abstract/Greater Depth Task: Identify that some changes to shapes are permanent and others are temporary, and that this can influence their uses **Key vocabulary:** materials, magnet, objects, metal, plastic, wood, paper, fabric, glass, properties, sorting, soft, rough, bumpy, shiny, transparent, translucent, hard, smooth, opaque, bumpy, stretchy, bendy **Key scientists and inventors:** **Charles Macintosh** (Chemist and inventor of waterproof clothing), J**ohn McAdam** (Inventor of the modern road surface), **Victoria Callaghan** (Develops sustainable packaging for BASF plc), **Dr Pearl Agyakwa** (Materials scientist who studies why some materials wear out and other don't)  **Key vocabulary:**	• **What are some contact forces?** Know some examples of contact forces. Compare the advantages and disadvantages of friction. Investigate the force of friction on different surfaces. • **What are some non-contact forces?** Recall some non-contact forces. Describe the structure of a magnet Investigate how magnets attract and repel objects at a distance. • **Are all metals magnetic?** Name the magnetic materials. Group materials as magnetic or non-magnetic. Develop an investigation to test magnetic materials. • **Can you make a magnet stronger?** Know some different types of magnets. Understand how the strength of a magnet can be changed Investigate the strength of different magnets. • **Can magnets help us when we are lost?** Describe the structure of a simple compass. Understand how a compass works. Make a compass. Suggested Extended Abstract/Greater Depth Task: Describe ways in which the attraction and repulsion of magnets is used in daily life (e.g. handbag clasps) Progression maps **Key vocabulary:**	Know what is meant by electric current. Describe some ways electricity is made. Explain what a circuit is. • **What are the parts of a circuit?** Recall the different components of a circuit. Describe how different components have different uses in devices. Explain how a switch helps us control a circuit. • **Conductors or insulators?** Define the volume of a sound. Describe how volume can be increased. Explain some negative effects of loud sounds. • **Is electricity safe?** **Define a hazard. Identify** some electrical hazards. Explain how insulators can be used for protection. • H**ow has electricity changed the word?** Consider the availability of electricity around the world. Discuss some of the social issues around electrical supply. Suggest some solutions for supplying electricity. Suggested Extended Abstract/Greater Depth Task: Explore why some appliances run on mains electricity whilst others run on battery Progression maps **Key vocabulary:** charge, electrostatic forces, static, flow, appliances,	• **What are thermal conductors and insulators?** Name some conductors and insulators. Give some uses of conductors and insulators. Carry out tests to compare the properties of some materials. • **What happens when we mix materials?** Recognise some soluble materials. Give some examples of solutions. Explain how we can make things dissolve faster. • **What are reversible changes?** Recall some insoluble materials. Describe some reversible changes. Carry out an investigation to show that changes of state are reversible changes. • **How do we separate some mixtures?** State how sieves can be used to separate some mixtures. Describe the filtering technique. Explain how evaporation is used to separate some mixtures. • **What are reversible changes?** Recall some irreversible changes. Describe the characteristics of irreversible changes. Investigate an irreversible change. Suggested Extended Abstract/Greater Depth Task:	• **How do we classify plants?** Distinguish between flowering and non-flowering plants. Understand how different plants reproduce. Explore the uses of various plants. • **What are microorganisms?** Name some microorganisms. Consider the role of various microorganisms. Plan an investigation. • **Are there some tricky classifications?** Revisit characteristics of a variety of plants and animals. Study some organisms that are difficult to classify. Create an organism. • **Can we study local habitats?** Identify some organisms in their natural habitat. Study some organisms in their natural habitat. Classify organisms found in a local habitat. • **Who was Carl Linnaeus?** Recall who Carl Linnaeus was. Describe the binomial naming system. Explain the importance of a universal naming system. Suggested Extended Abstract/Greater Depth Task: Explain why other features are less useful as a basis for classification, such as colour Progression maps **Key vocabulary:** plants, animals, classify, vertebrate, invertebrate,

		stem, leaf, root, blossom, bulbs, seeds, petals, fruit, germinate, grow, life cycle **Key scientists and inventors:** **George Washington Carver** (Researched farming techniques to keep soil full of nutrients), **Daniel Solander** (Botanist who worked with Joseph Banks on Captain Cook's voyage around the World), **Joseph Banks** (Naturalist on Captain Cook's voyage around the World), **Thomas Wyatt Turner** (Botanist who studied plant disease), **Poppy Okotcha** (Horticulturalist interested in the connection between healthy environments, healthy food, and healthier people), **Dr Ben Woodcock** (Ecological Entomologist who helps farmers grow food, so it is safe for insects and other wildlife), **Angie Burnett** (Plant Biologist who grows plants and sees how they react to different conditions)	contact, contraction, tendon, friction, lubricant, attract, repel, gravity, magnetic, pole, compass **Key scientists and inventors:** **Maglev trains**, **William Gilbert** (Doctor who developed the theory of magnetism), **Leonardo Da Vinci** (First person to plan and carry out tests on friction) **Eric Laithwaite** (Electrical Engineer who developed the technology behind the Maglev train)	circuit, current, fossil fuels, nuclear, renewable, components, voltage, generator, hazards, conductor, insulator, electric shock. **Key scientists and inventors:** **Josephine Cochrane (**invented the dishwasher**), Benjamin Franklin, Luigi Galvani, Nikola Tesla, Thomas Edison** (Inventor of the lightbulb and power grid), J**oseph Swan** (Physicist & Chemist who developed a primitive electric light 20 years before Thomas Edison), **Lewis Howard Latimer** (Electronic Engineer who improved the design of Edison's light bulb and brought street lighting to the world), **Ronit Kanwar** (Businessman who set up company to provide affordable, sustainable solar-powered lights for poor in rural India), **William Kamkwamba** (Inventor who used wind turbines to bring electricity to his village in Malawi), **Zubera Iqbal** (Chemist who explores sustainable ways to recycle electric vehicle batteries)	Provide examples of when changes being irreversible are a good thing, e.g. making bricks, or not, e.g. non-biodegradable plastic bags Progression maps **Key vocabulary:** Ceramics, durability, silica, silicon, synthetic, thermal conductors, thermal insulators, microplastics, sieve, acetone, alloy, dissolved, soluble, solution, solvent, alkali, bicarbonate, irreversible, neutralisation, phlogiston **Key scientists and inventors:** **Stephanie Kwolek** (Inventor of Kevlar), **Spencer Silver & Arthur Fry** (Chemical Engineer & Chemist respectively who invented the post-it note) **Ruth Benerito** (Chemist who developed wrinkle-free cotton fabric), **Andre Geim & Konstantin Novoselov** Physicists who discovered graphene), **Jamie Garcia** Chemist who discovered a fully recyclable plastic), **Raquel Prado** (Chemist who develops a sustainable fabric that looks like leather but comes from pineapple leaves)	insects, spiders, fish, amphibians, mammals, birds **Key scientists and inventors:** **Carl Linnaeus** (Botanist & Zoologist who developed a taxonomy for classifying organisms), **Agnes Arber** (Botanist and first woman to become a fellow of the Royal Society who studied aquatic flowering plants and monocots, a group of flowering plants), **Hu Xiansu** (Botanist and founder of plant taxonomy in China), **Beatrix Potter** (Mycologist, study of fungi, and Scientific Illustrator)
Wk9,10&11	• Seasonal Change – Physics • Observe changes across the four seasons	• Animals including humans – Biology	• Plants – Biology • **What are the plants of a plant?**	• Living things and their **habitats – Biology**	• Living things and their habitats – Biology	• Electricity – Physics • **How do electrical appliances work?**

	• Observe and describe weather associated with the seasons and how day length varies Suggested Extended Abstract/Greater Depth Task: Make and test predictions relating to changing day length and weather patterns **Key vocabulary:** summer, spring, winter, autumn, weather, seasons, temperature, frost, comparing, longer, shorter **Key scientists and inventors:** **George James Symons** (British meteorologist Invented his own version of the rain gauge), **Jim Cantore** (Meteorologist and storm tracker)	• 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. Caterpillars / frogs Suggested Extended Abstract/Greater Depth Task: Suggest how the basic needs of different animals influences their choice of habitat **Key vocabulary:** healthy, unhealthy, survival, offspring, grow, nutrition, diet **Key scientists and inventors:** **Florence Nightingale** (Nurse and founder of modern nursing), **Elizabeth Garrett Anderson** (First English woman to qualify as a doctor), **Dr Kelly Blacklock** (Veterinary Surgeon), **Daniella Dos Santos** (Veterinary Surgeon), **Maria Merian (**recognised the life cycle of a caterpillar)	Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • **What do plants need to grow?** 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 • **How does water move through a plant?** Investigate the way in which water is transported within plants • **Why do plants need flowers?** Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. • **How do plants make more plants?** Follow the journey of pollen in a plant and describe what happens when eggs and pollen meet. Explain how wind and animals are involved in plant processes • **What are the stages of a life cycle?** Sequence stages in plant life cycle. Describe the process of germination. Investigate conditions for seed growth Suggested Extended Abstract/Greater Depth Task: Contrast the features of two very different plants (e.g. sunflower v ivy) and hypothesise as to why they may be this way	• **How can we sort living things?** Know what is meant by characteristics. Know some characteristics of non-flowering plants. Sort plants into groups **Name the different types of vertebrates.** Name the different types of vertebrates. Give some characteristics of different types of vertebrates. Summarise the similarities and differences between different types of vertebrates. **What are invertebrates?** Recognise different types of invertebrates. Give some characteristics of different types of invertebrates. Compare the characteristics of different invertebrates. • What is a classification key? Develop questions that can be used to sort living things in to groups. Use a classification key. Construct a classification key. • **How can we see living things in their habitats?** Understand ways habitats can change naturally. Consider ways humans have changed habitats. Suggest ways humans can positively affect habitats. • **How do humans affect plant and animal habitats?** Pupils use a video clip as a secondary source of data to	• **Do all mammals develop the same way?** Recall the life cycle of mammals . Outline the similarities in the life cycles of mammals . Describe some differences in the life cycle of mammals. • **What is metamorphosis?** Recall the life cycle of amphibians. Describe how water supports an amphibian life cycle . Explain some of the challenges amphibians face on land. • **What is inside a cocoon?** Recall the life cycle of insects . Outline the similarities in the life cycles of different insects. Describe some differences in the life cycle of different insects. • **Which came first, the chicken or the egg?** Recall the life cycle of birds . Outline the ways birds care for unhatched young. Give examples of ways young birds are cared for. • **Why is there variation amongst living things?** Know what is meant by sexual reproduction . Know how sexual reproduction produces variation . Know why variation is important. • **Do you always need to have 2 parents to reproduce?**	Recall what an electric circuit is. Identify the main parts of a circuit. Describe the role of the components • **Why do batteries have voltage?** Define voltage. Compare batteries of different sizes and their typical voltage. Explain how adding batteries together increases total voltage. • **What are parts of a circuit?** Identify common electrical components. Explain how each component uses electricity to serve its function. Draw a circuit diagram with various components. • **What are circuit diagrams?** Identify common circuit symbols. Construct simple circuit diagrams. Explain the advantages of using circuit diagrams. • **How can we use electricity safely?** Identify electrical hazards. Describe risks. Suggest ways to reduce electrical risks. • **What is the history of electricity?** Read about early experiments. Recall important scientists and inventors. Describe some major developments.

			Progression maps **Key vocabulary:** absorb, anchor, carbon dioxide, flowers, fertiliser, leaves, minerals, nutrients, stem, trunk, roots, carpel, filament, anther, stamen, stigma, style, pollen egg, ovary, fruit, seed, germination, pollination, fertilisation **Key scientists and inventors:** **Jan Baptiste Van Helmont** (chemist, physiologist, physicist), **Mary Seacole** (herbalist), **Jan Ingenhousz** (Doctor & Scientist who discovered the process of photosynthesis), **Carl Linnaeus** (Botanist who studied the conditions for successfully growing bananas), **Dr Kelsey Byers** (Biologist who studies flower smells and how they attract insects)	answer questions. Pupils make anti-litter posters. Suggested Extended Abstract/Greater Depth Task: Devise own classification keys to group living things Classification grids in science cupboard. Progression maps **Key vocabulary:** characteristics, invertebrates, vertebrates, cold-blooded, warm-blooded, gills, entomologist, antennae, abdomen, thorax, colonies, pooter, sweep net, deforestation, endangered, extinct, slash-and-burn. **Key scientists and inventors:** Hesy-Re (an Egyptian scribe considered the first dentist), **Jacques Cousteau** (Oceanographer and co-inventor of the aqualung), **Rachel Carson** (Aquatic Biologist who wrote about environmental pollution), **Rachel Carson** (Aquatic Biologist who wrote about environmental pollution), **Kelsey Archer Barnhill** (Deep Sea Ecologist who sends robots to the seafloor to collect samples of different animals to study), **Liz Bonnin** (TV Presenter & Wildlife Conservationist) • Animals including humans – Biology • **Can we group animals by what they eat?**	Know what is meant by asexual reproduction . Know some plants and animals that reproduce asexually. Know some advantages and disadvantages of asexual reproduction. Chicks hatching. Tadpoles and frogs from pond- pond dipping equipment in cupboard. Suggested Extended Abstract/Greater Depth Task: Consider why there are different forms of reproductive systems for animals such as egg laying, larvae and live young Progression maps **Key vocabulary:** Mammary glands, marsupials, offspring, camouflaged, clusters, embryo, frog spawn, metamorphosis, tadpole, cocoon, entomologists, larva/ larvae (plural), moulting, nymph, parasites, pupa, scabies, down, egg tooth, incubated, asexual, fertilisation, ovaries, ovules, testes, variation, bulb, cutting, clone, plantlet, regenerate, tuber **Key scientists and inventors:** **Alfred Russel Wallace (**Explored the Amazon 1848), **David Attenborough** (Naturalist & TV Presenter), **Jane Goodall**	Suggested Extended Abstract/Greater Depth Task: Explain how the switch for a fridge light works. Draw the circuit. Progression maps **Key vocabulary:** Circuit, component, insulator, lithium, switch, voltage, electrical engineers, shaft **Key scientists and inventors:** **Garrett Morgan** (Inventor 3 position traffic signal and gas masks **), Nikola Tesla** (Electrical & Mechanical Engineer who developed the AC electrical system and made important advances in technologies such as x-rays, neon lights and robotics), **Alessandro Volta** (Physicist who developed the electric battery), **Mildred S Dresselhaus** (Materials Scientist whose research led to the development of the rechargeable batteries) • Animals including humans – Biology • **What is the circulatory system?** Know what the circulatory system does. Identify the main parts of the heart. Know the importance of cardiac muscle. • **How does blood get around the body?** Know the role of blood vessels.

				Recall why plants are important. Recall which feeding group animals belong to. Explain the importance of herbivores. • **Who eats what?** Understand what is meant by a food chain. Construct food chains. Describe how food chains can be disrupted. • **Why are we born without teeth?** Understand what is meant by digestion. Identify the parts of the human digestive system. Explain how digestion begins in the human body. • **Why doesn't the stomach digest itself?** Recall the role of the oesophagus. Describe the conditions in the stomach. Explain how the stomach breaks down food in animals. • **How big is the small intestine?** Recall the structure of the small intestine. Describe the role of the small intestine. Explain what happens to nutrients that are absorbed across the small intestine. • **Are all bacteria bad for us?** Recall the structure of the large intestine. Describe the role of the large intestine. Explain the role of bacteria in the large intestine. Suggested Extended Abstract/Greater Depth Task: Debate and explain why	(Wildlife Researcher & Conservationist who studied chimpanzees), **Roger Arliner Young** (Zoologist who studied reproduction in marine organisms), **Ernest Everett Just** (Zoologist who studied the early development of marine invertebrates) • Animals including humans – Biology • **Where does human life begin?** Know the stages of the human life cycle. Describe the baby stage of the human life cycle. Recognise development milestones. • **How does a child prepare for adulthood?** Know what is meant by an adolescent. Describe some changes during puberty. Investigate growth during puberty Suggested Extended Abstract/Greater Depth Task: Explain how old age is – in many way – similar to early life (e.g. muscular strength) Progression maps **Key vocabulary:** milestones, acne, adolescence, adolescent, antiperspirant, puberty, scrotum, testes, wet dreams, foetus, mature, menstrual cycle, mood swing, peer pressure, period, vaginal discharge, womb, amniotic fluid, ultrasound, umbilical	Describe the structure of blood vessels. Explain how blood pressure is generated. • **What is in the blood?** Identify the components of blood. Know the function of blood components. Create a model representing blood components. • **How do we get water and nutrients?** Recall the role of the digestive system. Know how the blood transports nutrients. Explain the effects of lack of nutrients. • **How can we keep our heart healthy?** State some circulatory system illnesses. Describe some causes of illness. Explain how we can keep our circulatory system healthy. • **What are some blood disorders?** Recall blood components. Describe disorders of the blood. Explain how different components are affected by blood disorders. Progression maps Suggested Extended Abstract/Greater Depth Task: Predict what might happen to someone's organs if they only ever ate McDonalds food; which organs would be most affected and how? **Key vocabulary:**

				humans have ended up at the top of the food chain Progression maps **Key vocabulary:** carnivore, consumer, herbivore, omnivore, predator, prey, producer, food chain, microplastics, canines, enamel, incisors, molars, premolars, salivary glands, taste buds, umami. **Key scientists and inventors:** **William Beaumont** (Surgeon who first observed and studied human digestion as it occurs in the stomach) **Washington & Lucius Sheffield** (Dentists who invented toothpaste in a tube)	cord, gestation period, Alzheimer's, dementia, elastic **Key scientists and inventors:** **Jean Piaget** (Human Development), **Stephanie Kwolek** (Inventor of Kevlar), **David Attenborough** (Naturalist & TV Presenter) **Jane Goodall** (Wildlife Researcher & Conservationist who studied chimpanzees), **Roger Arliner Young** (Zoologist who studied reproduction in marine organisms), **Ernest Everett Just** (Zoologist who studied the early development of marine invertebrates), **Robert Winston** (Professor of Science and Society, Emeritus Professor of Fertility Studies & TV presenter)	Cardiac, muscle, circulatory system, valves, arteries, blood pressure, capillaries tourniquet, veins, varicose veins, clot plasma, platelet, red blood cells, white blood cells, cholesterol, stroke, anaemia, disorder, haemophilia, leukaemia, sickle cell **Key scientists and inventors:** **William Harvey** (Doctor who discovered the nature of blood circulation and the function of the heart as a pump), **Santorio Santorio** (Doctor who invented an instrument to measure pulse), **Richard Doll** (Doctor who proved the link between lung cancer and smoking), **Ruth Ella Moore** (Bacteriologist who researched immunology, blood groups and tuberculosis), **James Miranda Steuart Barry** (Doctor - born Margaret Bulkley, who went to medical school by presenting as male and lived the rest of his life as a man – who became Inspector General of military hospitals and improved conditions for wounded soldiers, native inhabitants, and performed the first caesarean section in Africa)

IT Resources

LGFL - Busythings
LGFL – Virtual Experiments Years 1&2
LGFL – Virtual Experiments Years 3 & 4
LGFL – Virtual Experiments Years 5 & 6

LGFL – Switched On Science
LGFL – Space Adventures – Mission to the Moon KS2 resource
LGFL – Polar Explorations KS2 resource

HEP Resources
Password: **CurriculHEP24***

Steam School Years 5 & 6

Textmarker
Username: n178nn
Password: writing

Explorify
Activities for pre and multi.

Reach Out CPD
CPD for all subjects taught in science in each year group.

Trips

Chemistry	Rocks	1. Sir John Soane's Museum, Holborn 2. Lesnes Abbey Woods, Bexley 3. Fulham Palace House & Garden, Fulham	1. Rocks and Soils, Shadows and Reflection 2. Rocks and Soils, Habitats 3. Materials
Biology	Plants	1. Garden Museum, Lambeth 2. Kew Gardens, Richmond 3. Forty Hall Museum, Enfield 4. Tottenham Marshes, Tottenham	1. Vegetable Investigations, Water Transport in Plants, Photosynthesis, Plant Adaptation, Food Chains and Webs, Seeds 2. Plants, Evolution and Adaptation, Pollination, Ecology, Nature 3. Wildlife 4. Rocks and Soils, Habitats

		5. Lesnes Abbey Woods, Bexley 6. Natural History Museum, South Kensington 7. Fulham Palace House & Garden, Fulham 8. Hall Place & Gardens, Bexley 9. Epping Forest Field Centre 10. Horniman Museum and Gardens, Dulwich	5. Marine Life, Habitats, Fossils, 6. Plants 7. Plants 8. Plants and animals, living things and their habitats, nature, fieldwork 9. Habitats, Classification, Adaptations, 10. Anthropology, Bones and Teeth, Evolution, Fossils, Pond Dipping,
	Animals including humans	1. Horniman Museum and Gardens, Dulwich 2. Science Museum, South Kensington 3. Hall Place & Gardens, Bexley 4. Alexander Fleming Laboratory Museum, Paddington 5. British Dental Association, Marylebone 6. Grant Museum of Zoology, Fitzrovia 7. Bruce Castle Museum, Tottenham	1. Medicine and Health, Digestive System, Medicine and Health 2. Medicine and Health, Digestive System, Medicine and Health 3. Life Cycles, Classification, 4. Antibiotics, History of Medicine 5. Teeth and eating 6. Bones, Skeletons, Teeth, Classification, Adaptations and Evolution 7. Fossils, Teeth, Vertebrates, Plants and Trees
	Evolution	1. Hall Place & Gardens, Bexley 2. Grant Museum of Zoology, Fitzrovia	1. Adaptation, 2. Bones, Skeletons, Teeth, Classification, Adaptations and Evolution
Physics	Space	1. National Maritime Museum, Greenwich 2. National Army Museum, Chelsea	1. Space 2. Coding, Materials, Gravity

		3. Royal Observatory, Greenwich 4. Science Museum, South Kensington	3. Space 4. Space, Forces
	Light	1. Sir John Soane's Museum, Holborn 2. Benjamin Franklin House, Covent Garden	1. Rocks and Soils, Shadows and Reflection 2. Light
	Forces	1. RAF Museum London, Colindale 2. Faraday Museum at The Royal Institution	1. Gravity, Forces, Flight, Materials, Levers, Pulleys and Simple Machines 2. Magnets and Motors,