Science Progression Components Map

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically		*Do all objects form a shadow?* *Can I test the forces of gravity?* *Can I record how the body changes during and after exercise?* *Do all minibeasts live under rocks?* *Does my plant need water and light to grow?* *Can I locate and identify deciduous and evergreen trees?* *Can I test objects which are porous and impermeable to see if they float or sink?* *Can I decide which objects will be best to make a boa that can float?* *Which materials are best to keep my shelter waterproof?* *Can I plan and test the materials which make the strongest shelter?*	*Can I make carefully observations of the effect of sugar on teeth?* *Can I sort materials according to their properties?* *Can I explain which materials are the most absorbent?* *Can I perform a test to see how to make a paper aeroplane fly the furthest?* *Can I make careful observations over time of the change in weather?* *Can I make observations about micro-habitats in our school grounds?* *Can I group animals and plants according to their habitat?* *Can I predict, then discover the best conditions to grow cress?*	*Can I use scientific equipment to explore how light travels through different materials?* *Can I plan a fair test to discover how to create shadows and find patterns?* *Can I Sort and classify rocks and present my findings?* *Can I explore the properties of soil and classify my findings?* *Can I plan test to explore how friction affects the movement across different surfaces?* *Can I investigate which materials are magnetic and report my conclusions?* *Can I classify living things and present my learning, explaining choices?* *Can I use standard measurements accurately to investigate what happens to the state of water when it is heated or cooled?*	*Can I report on and explain the importance of light?* *Can I use scientific equipment to explore how to make a light bulb work?* *Can I use scientific drawings to show the parts of a plant?* *Can I prove how water is transported through plants?* *Can I plane a fair investigation to answer the question 'What are best conditions for plant growth'?* *Can I prove that sound travels through vibrations and explain my findings scientifically?* *Can I use scientific diagrams to explain how the digestive system works?* *Can I make accurate measurements to investigate the weight of gas?* *Can I investigate the effects of heating and cooling different materials?*	*Can I take accurate measurements to measure force?* *Can I use a range of scientific equipment to investigate how to make a simple lever?* *Can I plan and carry out an investigation to test magnet strength?* *Can I prove scientifically which is the best material to keep warm?* *Can I use a fair test to answer 'Which ice cube will melt the quickest'?* *Can I demonstrate how to separate mixtures using scientific equipment?* *Can I explain and prove which materials would be best to use when making a boat?* *Can I show and explain how gestation periods vary across a range of animals and humans?* *Can I present my finding to show which substances dissolve in water?* *Can I use scientific models to demonstrate how day and night work?* *Can I take accurate measurement to discover if a crater will have a larger diameter when a marble is dropped from a greater height?* *Can I report scientifically on the parts of a flower and explain the differing ways in which they reproduce?*	*Can I make observations over time to explore what happens when we mummify tomatoes?* *Can I plan a fair test to demonstrate how to impact the size of a tornado?* *Can I take accurate measurements to discover if the structure of a building impacts on how it withstands an earthquake?* *Can we prove Darwin's theory that finches adapted to survive on the Galapagos Islands they inhabit?* *Can I use scientific equipment to show what is blood made up of?* *Can I use my knowledge of materials and how light travels to block out light to show the impact of a black out?* *Can I investigate and then present my findings on what can affect how components in a circuit work?*
		asking simple questions and recognising that they can be answered in different ways **observing closely, using simple equipment** **performing simple tests** **identifying and classifying** **using their observations and ideas to suggest answers to questions**		**asking relevant questions and using different types of scientific enquiries to answer them** **setting up simple practical enquiries, comparative and fair tests** **making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers**		**planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary** **taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate**	

		gathering and recording data to help in answering questions.		**gathering, recording, classifying and presenting data in a variety of ways to help in answering questions** **recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions** **using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions** **identifying differences, similarities or changes related to simple scientific ideas and processes** **using straightforward scientific evidence to answer questions or to support their findings.**		**recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs** **using test results to make predictions to set up further comparative and fair tests** **reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations identifying scientific evidence that has been used to support or refute ideas or arguments**	
Biology		**PLANTS**					
		Maria Sibylla Merian (German artist, scientific illustrator, and naturalist) **Become familiar with different types of plants and their structure.** **Identify and name a variety of common plants, including garden plants, wild plants and trees and those classified as deciduous and evergreen.** **Identify the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers.** **Observe and describe what is needed for seeds to grow into plants.** **Find out that plants need water, light and a suitable temperature to grow and stay healthy.** **Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers.**	**Poppy Okotcha** (Horticulturalist interested in the connection between healthy environments, healthy food, and healthier people) **Angie Burnett** (Plant Biologist who grows plants and sees how they react to different conditions that make it more difficult for them to grow) **Thomas Wyatt Turner** (Botanist who studied plant disease) **Identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers.** **Observe and describe how seeds and bulbs grow into mature plants.** **Describe how plants need water, light and a suitable temperature to grow and stay healthy.**		**Dr Kelsey Byers** (Biologist who studies flower smells and how they attract insects) **Carl Linnaeus** (Botanist who studied the conditions for successfully growing bananas and developed a method to reproduce them in Europe) **Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers** **Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant** **Investigate the way in which water is transported within plants.**	**Charles Henry Turner** (Zoologist who made ground-breaking discoveries about insect behaviour) **Jagadish Chandra Bose** (Biophysicist who measured plant response to different stimuli) **George Washington Carver** (Agricultural Scientist who encouraged the planting of different crops to prevent soil degradation) **Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.** **Identify how animals and plants are adapted to suit their environment in different ways and that adaptation**	
		LIVING THINGS AND THEIR HABITATS					
		Explore the differences between things that are	**Prem Singh Gill** (Polar Scientist who studies where Antarctic seals live,	**Construct and interpret a variety of food chains and food webs, identifying**	**Kelsey Archer Barnhill** (Deep Sea Ecologist who sends robots to the seafloor	**David Attenborough** (Naturalist & TV Presenter)	**Agnes Arber** (Botanist and first woman to become a fellow of the Royal

		living, that are dead and that have never been alive. **Identify and name a variety of animals in their habitats, including micro-habitats.** **Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.** **Identify and name a variety of common animals that are birds, fish, amphibians, reptiles, mammals and invertebrates.** **Identify and name a variety of common animals that are carnivores, herbivores and omnivores.**	breed and feed, so we can know more about where they prefer to live) **Know and compare the differences between things that are living, that are dead and 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 plants and how they depend on each other.** **Identify and name a variety of plants and animals in their habitats, including micro-habitats.** **Describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name prey and predator.**	**producers, predators and prey.** **Recognise that living things can be grouped in a variety of ways.** **Recognise that environments can change and that this can sometimes pose dangers to specific habitats.**	to collect samples of different animals to study) **Demonstrate and explain 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** **Construct and interpret a variety of food webs, identifying producers, predators and prey.**	**Jane Goodall** (Wildlife Researcher & Conservationist who studied chimpanzees) **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.**	Society who studied aquatic flowering plants and monocots, a group of flowering plants) **Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals.** **Give reasons for classifying plants and animals based on specific characteristics.** **Explain the differences in the life cycles of a mammal, an amphibian, an insect and a bird.** **Explain the life process of reproduction in some plants and animals.**
	ANIMALS, INCLUDING HUMANS						
		Miller Hutchinson (Engineer who invented the first electric hearing aid) **Patricia Bath** (Ophthalmologist and inventor of using lasers in cataract operations) **Investigate basic human needs. (How do you grow and change? What do humans need to stay healthy?)** **Label the basic parts of the human body and say which part of the body is associated with each sense.** **Describe the importance for humans of exercise, eating**	**Florence Nightingale** (Nurse and founder of modern nursing) **Elizabeth Garrett Anderson** (First English woman to qualify as a doctor) **Washington & Lucius Sheffield** (Dentists who invented toothpaste in a tube) **Investigate and describe the basic needs of animals, including humans, for survival (water, food and air).** **Explain the importance for humans of exercise, eating the right amounts of**	**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) **Adelle Davis** (Biochemist & Nutritionist who linked health and diet) **Identify that animals and humans need the right types / 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**	**William Beaumont** (Surgeon who first observed and studied human digestion as it occurs in the stomach) **Paul Sharpe** (Bioengineer who studies how to regrow teeth if they become damaged) **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.** **Explain how animals and humans need the right types / amount of nutrition, and that they cannot make their**	**Virginia Apgar** (Doctor & Medical Researcher who developed a method of evaluating the well-being of new-born babies) **Describe the changes as humans develop to old age.**	**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 accurately using a pendulum and did the first scientific study of the metabolism) **Richard Doll** (Doctor who proved the link between lung cancer) **Identify and name the main parts of the human circulatory system, and describe the functions of the**

		the right amounts of different types of food.	**different types of food and hygiene.** **Identify different parts of the human body and describe their core function, eg. Ears to listen, mouth to talk and eat, teeth to chew food, etc.** **Notice that animals, including humans, have offspring which grow into adults.** **Identify and name a variety of common animals e.g. fish, amphibians, reptiles, birds.** **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).**	**skeletons and muscles for support, protection and movement.**	**own food; they get nutrition from what they eat.** **Explain how humans and some other animals have skeletons and muscles to support, protection and movement.** **Name different types of skeleton in animals.**		**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.**
	EVOLUTION AND INHERITANCE						
		Identify how humans look like their parents in many features.		**Mary Anning** (Fossil hunter who developed the theory that dinosaurs had become extinct a long time ago) **Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.** **Describe in simple terms how fossils are formed when things that have lived are trapped within sedimentary rock.**			**Alfred Wallace** (Natural Historian who developed the theory of evolution by natural selection) **Emma Dunne** (Palaeobiologist who investigates how ancient climate change affected the evolution of different species) **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) **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.** **Explain how living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.**
CHEMISTRY	**ROCKS AND SOILS**						
				William Smith (Engineer & Geologist who developed the science of rock strata) **James Hutton** (Scientist who studied rocks and the effects of natural processes on them, such as rain, running water, tides and volcanoes, on the development of the Earth) **Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties.** **Recognise that soils are made from rocks and organic matter.** **Relate the simple physical properties of some rocks to their formation (igneous or sedimentary).**			
	MATERIALS AND STATES OF MATTER						
		Chester Greenwood (Inventor of earmuffs) **Distinguish between an object and the material from which it is made.**	**Charles Macintosh** (Chemist and inventor of waterproof clothing) **Dr Pearl Agyakwa**	**Compare and group materials together, according to whether they are solids, liquids or gases.** **Observe that water changes state when it is heated or**	**Group materials together, according to whether they are solids, liquids or gases and explain choices using scientific vocabulary.**	**Jamie Garcia** (Chemist who discovered a fully recyclable plastic) **Raquel Prado** (Chemist who develops a sustainable fabric that looks	**Use knowledge of solids, liquids and gases to explain how mixtures can be separated.** **Demonstrate and explain how dissolving, mixing and**

		Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. **Describe the simple physical properties of a variety of everyday materials.** **Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.** **Identify and compare suitability of a variety of everyday materials.**	(Materials scientist who studies why some materials wear out and other don't) **Recall the simple physical properties of a variety of everyday materials.** **Distinguish between an object and the material from which it is made, giving reasons for why it is made from that material.** **Compare and group together a variety of everyday materials on the basis of their simple physical properties.** **Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses.** **Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching, and link to the purpose of the object.**	**cooled, and measure 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.**	**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).**	like leather but comes from pineapple leaves that would otherwise be burnt) **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.** **Understand how some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.** **Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.** **Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic.** **Demonstrate that dissolving, mixing and changes of state are reversible changes.** **Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.**	**changes of state are reversible changes.** **Explain, with evidence, 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, oxidisation and the action of acid on bicarbonate of soda.**
	WEATHER AND SEASONS						
		Observe changes across the four seasons.	**Jim Cantore** (Meteorologist and storm tracker) **Explain changes across four seasons.**				

PHYSICS			**Observe the apparent movement of the Sun during the day.** **Observe and describe weather associated with the seasons and how day length varies.**				
	LIGHT AND DARK						
		Observe and name a variety of sources of light, including electric lights, flames and the Sun. **Know that when light is blocked, a shadow is formed.**		**Percy Shaw** (Inventor of the cat's eye) **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.** **Explain how light from the sun can be dangerous and that there are ways to protect eyes.** **Explain how shadows are formed when the light from a light source is blocked by a solid object.** **Find patterns in the way that the size of shadows change.**			**Euclid** (Mathematician who predicted that light travels in straight lines and we only see things that light falls on) **Ibn al-Haytham (Alhazen)** (Physicist & Mathematician who developed a theory that light travels in a straight line, and proved it by carrying out the first scientific experiment) **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, and to predict the size of shadows when the position of the light source changes.**
	SOUND						
					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) **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 pitch and features of the object that produced it. Find patterns between 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.		
	FORCES, MAGNETS AND ELECTRICITY						
			Notice and describe how things move, using simple comparisons such as faster and slower. Compare how different things move.	**William Gilbert** (Doctor who developed the theory of magnetism) **Leonardo Da Vinci** (First person to plan and carry out tests on friction) Compare how things move on different surface. 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. Make and use simple magnetic compasses.	**Thomas Edison** (Inventor of the lightbulb and power grid) **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) Identify common appliances that run on electricity. Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery.	**Archimedes** (Mathematician who developed theories about how levers and pulleys can lift and move heavy objects) **Isaac Newton** (Mathematician & Physicist who developed theories about gravity) **Brahmagupta** (Mathematician & Astronomer who was the first scientist to talk about gravity) Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effect of drag forces, such as air resistance and friction that act between moving surfaces. Predict whether two magnets will attract or repel each other, depending on which poles are facing – explaining how you know. Recognise that some mechanisms, including levers, pulleys and gears,	**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) **Mildred S Dresselhaus** (Materials Scientist whose research led to the development of the rechargeable batteries in all modern electronic equipment) 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 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.**	**allow a smaller force to have a greater effect.** **Identify the effect of water resistance.**	
	EARTH AND SPACE						
						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) **Margaret Hamilton** (Computer Scientist who was responsible for the software that allowed astronauts Neil Armstrong and Buzz Aldrin to land on the Moon) **Valentina Tereshkova** (Astronaut and first woman in space) **Mae Jemison** (Astronaut and first Black woman in space) **Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.** **Describe the movement of the Moon relative to the Earth.**	

						Describe the Sun, Earth and Moon as approximately spherical bodies. **Use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.**	