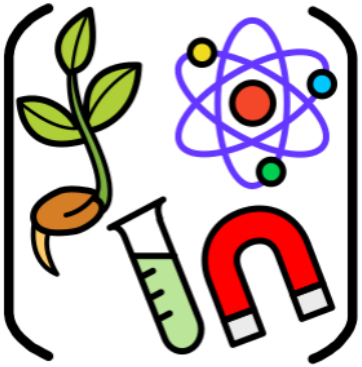
Science

Subject Intent

At Three Bridges Primary School, we want every child to **engage** with working scientifically to foster an **enjoyment** of science. This will be **achieved** through the implementation of an ambitious curriculum that promotes the real life application of science, and provides pupils with the knowledge and skills they need to succeed in life. Working scientifically helps pupils to develop **resilience** by overcoming problems and gives them the skills they need for future learning such as observation, questioning, enquiry and to become confident scientists.



Science progression:

	Intent: The Science curriculum aims to nurture curiosity, embed knowledge and develop the enquiry skills that enable children to understand the science of the world around them.					
EYFS	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	Animals including humans					
Can they explain how they have changed? Can they describe the difference between herbivores and carnivores? Can they talk about the lifecycles of an animal?	Can they point out some of the differences between different animals? Can they sort photographs of living things and non-living things? Can they identify and name a variety of common animals? (birds, fish, amphibians, reptiles, mammals, invertebrates) Can they describe how an animal is suited to its environment? Can they identify and name a variety of common animals that are carnivores, herbivores and omnivores? Can they name the parts of the human body that they can see? Can they draw & label basic parts of the human body? Can they identify the main parts of the human body and link them to their senses? Can they name the parts of an animal's body? Can they name a range of domestic animals?	Can they describe what animals need to survive? Can they explain that animals grow and reproduce? Can they explain why animals have offspring which grow into adults? Can they describe the life cycle of some living things? (e.g. egg, chick, chicken) Can they explain the basic needs of animals, including humans for survival? (water, food, air) Can they describe why exercise, balanced diet and hygiene are important for humans?	Can they explain the importance of a nutritionally balanced diet? Can they describe how nutrients, water and oxygen are transported within animals and humans? Can they identify that animals, including humans, cannot make their own food: they get nutrition from what they eat? Can they describe and explain the skeletal system of a human? Can they describe and explain the muscular system of a human?	Can they identify and name the basic parts of the digestive system in humans? Can they describe the simple functions of the basic parts of the digestive system in humans? Can they identify the simple function of different types of teeth in humans? Can they compare the teeth of herbivores and carnivores? Can they explain what a simple food chain shows? Can they construct and interpret a variety of food chains, identifying producers, predators and prey?	Can they describe the changes as humans develop to old age? **Challenging** Can they create a timeline to indicate stages of growth in certain animals, such as frogs and butterflies? Can they describe the changes experienced in puberty? Can they draw a timeline to indicate stages in the growth and development of humans?	Can they identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood? Can they recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function? Can they describe the ways in which nutrients and water and transported within animals, including humans? **Challenging** Can they explore the work of medical pioneers, for example, William Harvey and Galen and recognise how much we have learnt about our bodies? Can they compare the organ systems of humans to other animals? Can they make a diagram of the human body and explain how different parts work and depend on one another? Can they name the major organs in the human body?

	Can they classify animals by what they eat? (carnivore, herbivore, omnivore) Can they compare the bodies of different animals?					Can they locate the major human organs? Can they make a diagram that outlines the main parts of a body?
	Seasonal change					
Can they talk about and recognise the signs of Autumn? Can they talk about and recognise the signs of Winter? Can they talk about and recognise the signs of Spring? Can they talk about and recognise the signs of Summer?	Can they observe changes across the four seasons? Can they name the four seasons in order? Can they observe and describe weather associated with the seasons? Can they observe and describe how day length varies?					
	Plants					
Can they plant seeds? Can they describe how to care for and grow plants? Can they harvest grown fruit and vegetables? Can they talk about the life cycle of a plant?	Can they name the petals, stem, leaf, bulb, flower, seed, stem and root of a plant? Can they identify and name a range of common plants and trees? Can they recognise deciduous and evergreen trees? Can they name the trunk, branches and root of a tree? Can they describe the parts of a plant (roots, stem, leaves, flowers?)	Can they describe what plants need to survive? Can they observe and describe how seeds and bulbs grow into mature plants? Can they find out & describe how plants need water, light and a suitable temperature to grow and stay healthy?	Can they identify and describe the functions of different parts of flowering plants? (roots, stem/trunk, leaves and flowers)? Can they explore the requirement of plants for life and growth (air, light, water, nutrients from soil, and room to grow)? Can they explain how they vary from plant to plant? Can they investigate the way in which			

			water is transported within plants? Can they explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal?			
	Everyday materials					
Can they talk about some important processes To know some changes in the natural world including states of matter (freezing)? Can they talk describe Important processes and changes in the natural world including states of matter (melting, floating and sinking)?	Can they distinguish between an object and the material from which it is made? Can they describe materials using their senses? Can they describe materials using their senses, using specific scientific words? Can they explain what material objects are made from? Can they explain why a material might be useful for a specific job? Can they name some different everyday materials? e.g. wood, plastic, metal, water and rock Can they sort materials into groups by a given criterion? Can they explain how solid shapes can be changed by squashing, bending, twisting and stretching?	Can they explore how the shapes of solid objects can be changed? (squashing, bending, twisting, stretching) Can they find out about people who developed useful new materials? (John Dunlop, Charles Macintosh, John McAdam) Can they identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses? Can they explain how things move on different surfaces? Can they describe the simple physical properties of a variety of everyday materials? Can they compare and group together a variety of materials based on their simple physical properties?		Can they compare and group materials together, according to whether they are solids, liquids or gases? Can they explain what happens to materials when they are heated or cooled? Can they measure or research the temperature at which different materials change state in degrees Celsius? Can they use measurements to explain changes to the state of water? Can they identify the part that evaporation and condensation has in the water cycle? Can they associate the rate of evaporation with temperature?	Can they compare and group together everyday materials on the basis of their properties, including hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets? Can they explain how some materials dissolve in liquid to form a solution? Can they describe how to recover a substance from a solution? Can they use their knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving, evaporating? Can they give reasons, based on evidence for comparative and fair tests for the particular uses of everyday materials, including metals wood and plastic? Can they describe changes using scientific words?	

					(evaporation, condensation) Can they demonstrate that dissolving, mixing and changes of state are reversible changes? Can they explain that some changes result in the formation of new materials, and that this kid of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda? Can they use the terms 'reversible' and 'irreversible'? **Challenging** Can they describe methods for separating mixtures? (filtration, distillation) Can they work out which materials are most effective for keeping us warm or for keeping something cold? Can they use their knowledge of materials to suggest ways to classify? (solids, liquids, gases) Can they explore changes that are difficult or averse, e.g. burning, rusting and reactions such as vinegar with bicarbonate of soda? Can they explore the work of chemists who created new materials,	

					e.g. Spencer Silver (glue on sticky notes) or Ruth Benerito (wrinkle free cotton)?	
	Living things and their habitats					
Can they talk about different habitats? Can they recognise that some animals are nocturnal?		Can they match certain living things to the habitats they are found in? Can they explain the differences between living and non-living things? Can they describe some of the life processes common to plants and animals, including humans? Can they decide whether something is living, dead or non-living? Can they describe how a habitat provides for the basic needs of things living there? Can they describe a range of different habitats? Can they describe how plants and animals are suited to their habitat?		Can they recognise that living things can be grouped in a variety of ways? Can they explore and use a classification key to group, identify and name a variety of living things? (plants, vertebrates, invertebrates) Can they compare the classification of common plants and animals to living things found in other places? (under the sea, prehistoric) Do they recognise that environments can change and this can sometimes pose a danger to living things?	Can they describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird? Can they describe the life cycles of common plants? Can they explore the work of well know naturalists and animal behaviourists? (David Attenborough and Jane Goodall) **Challenging** Can they observe their local environment and draw conclusions about life-cycles, e.g. plants in the vegetable garden or flower border? Can they compare the life cycles of plants and animals in their local environment with the life cycles of those around the world, e.g. rainforests?	Can they 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? Can they give reasons for classifying plants and animals based on specific characteristics? **Challenging** Can they explain why classification is important? Can they readily group animals into reptiles, fish, amphibians, birds and mammals? Can they sub divide their original groupings and explain their divisions? Can they group animals into vertebrates and invertebrates? Can they find out about the significance of the work of scientists such as Carl Linnaeus, a pioneer of classification?
	Rocks					
			Can they compare and group together different rocks on the			

			basis of their appearance and simple physical properties? Can they describe and explain how different rocks can be useful to us? Can they describe and explain the differences between sedimentary and igneous rocks, considering the way they are formed? Can they describe in simple terms how fossils are formed when things that have lived are trapped within rock? Can they recognise that soils are made from rocks and organic matter?			
	Light					
			Can they recognise that they need light in order to see things? Can they recognise that dark is the absence of light? Can they notice that light is reflected from surfaces? Can they recognise that light from the sun can be dangerous and that there are ways to protect their eyes? Can they recognise that shadows are formed when the light from a light source is blocked by a solid object?			Can they recognise that light appears to travel in straight lines? Can they 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? Can they explain that we see things because light travels from light sources to our eyes or from light sources to object s and then to our eyes? Can they use the idea that light travels in straight lines to explain why shadows have the

			Can they find patterns in the way that the size of shadows changes?			same shape as the objects that cast them? **Challenging** Can they explain how different colours of light can be created? Can they use and explain how simple optical instruments work? (periscope, telescope, binoculars, mirror, magnifying glass, Newton's first reflecting telescope) Can they explore a range of phenomena, including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters.
	Forces and magnets					
			Can they compare how things move on different surfaces? Can they observe that magnetic forces can be transmitted without direct contact? Can they observe how some magnets attract or repel each other? Can they classify which materials are attracted to magnets and which are not? Can they notice that some forces need contact between two objects, but magnetic forces can act at a distance? Can they compare and group together a variety of everyday materials on the basis of whether they are		Can they explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object? Can they identify the effects of air resistance, water resistance and friction that act between moving surfaces? Can they recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect? **Challenging** Can they describe and explain how motion is affected by forces? (including gravitational	

			attracted to a magnet? Can they identify some magnetic materials? Can they describe magnets have having two poles (N & S)? Can they predict whether two magnets will attract or repel each other depending on which poles are facing?		attractions, magnetic attraction and friction) Can they design very effective parachutes? Can they work out how water can cause resistance to floating objects? Can they explore how scientists, such as Galileo Galilei and Isaac Newton helped to develop the theory of gravitation?	
	Sound					
				Can they describe a range of sounds and explain how they are made? Can they associate some sounds with something vibrating? Can they compare sources of sound and explain how the sounds differ? Can they explain how to change a sound (louder/softer)? Can they recognise how vibrations from sound travel through a medium to an ear? Can they find patterns between the pitch of a sound and features of the object that produce it? Can they find patterns between the volume of the sound and the strength of the vibrations that produced it? Can they recognise that sounds get fainter as the distance from		

				the sound source increases? Can they explain how you could change the pitch of a sound? Can they investigate how different materials can affect the pitch and volume of sounds?		
	Electricity					
				Can they identify common appliances that run on electricity? Can they construct a simple series electric circuit? Can they identify and name the basic part in a series circuit, including cells, wires, bulbs, switches and buzzers? Can they 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? Can they recognise that a switch opens and closes a circuit? Can they associate a switch opening with whether or not a lamp lights in a simple series circuit? Can they recognise some common conductors and insulators? Can they associate metals with being good conductors?		Can they identify and name the basic parts of a simple electric series circuit? (cells, wires, bulbs, switches, buzzers) Can they compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers, the on/off position of switches? Can they use recognised symbols when representing a simple circuit in a diagram? **Challenging** Can they make their own traffic light system or something similar? Can they explain the danger of short circuits? Can they explain what a fuse is? Can they explain how to make changes in a circuit? Can they explain the impact of changes in a circuit?

						Can they explain the effect of changing the voltage of a battery?
	Earth and space					
Can they talk about features of the world and Earth?					Can they identify and explain the movement of the Earth and other plants relative to the sun in the solar system? Can they explain how seasons, and the associated weather, is created? Can they describe and explain the movement of the Moon relative to the Earth? Can they describe the sun, earth and moon as approximately spherical bodies? Can they use the idea of the earth's rotation to explain day and night and the apparent movement of the sun across the sky? **Challenging** Can they compare the time of day at different places on the earth? Can they create shadow clocks? Can they begin to understand how older civilizations used the sun to create astronomical clocks, e.g. Stonehenge? Can they explore the work of some scientists? (Ptolemy, Alhazen, Copernicus)	
	Evolution and inheritance					
						Can they recognise that living things have

						changed over time and that fossils provide information about living things that inhabited the earth millions of years ago? Can they recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents? Can they give reasons why offspring are not identical to each other or to their parents? Can they explain the process of evolution and describe the evidence for this? Can they identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution? **Challenging** Can they talk about the work of Charles Darwin, Mary Anning and Alfred Wallace? Can they explain how some living things adapt to survive in extreme conditions? Can they analyse the advantages and disadvantages of specific adaptations, such as being on two rather than four feet? Can they begin to understand what is meant by DNA?