



Totley All Saints CE Primary School: Our Curriculum for Science



Early Learning Goals		How this is achieved in FS2	
Understanding the world	Managing Self <ul style="list-style-type: none">➤ manage own basic hygiene and personal needs, including dressing, going to the toilet, and understanding the importance of healthy food choices ELG 14 The Natural World <ul style="list-style-type: none">➤ explore the natural world around them, making observations and drawing pictures of animals and plants	<ul style="list-style-type: none">➤ discuss at snack time of the importance of healthy food choices➤ use stories and circle time discussions➤ P.E lessons that encourage getting dressed and undressed independently➤ name body parts through songs➤ talk about pets at home➤ explore minibeasts and recording observations➤ go on walks to observe the local environment and to compare and learn about the seasons➤ take photos to compare seasons and discuss➤ planting seeds and plants➤ create bug hotels➤ Woodland workshop activities	
	ELG 14 The Natural World <ul style="list-style-type: none">➤ understand some important processes and changes in the natural world around them, including seasons and changing states of matter	<ul style="list-style-type: none">➤ grow plants from bulbs and seeds➤ water tray activities to explore water, ice, and materials that float and sink, testing boats made of different materials➤ explore and test the best material for different functions eg. waterproof, transparent	
Year 1		Year 2	
Plants (Biology)	<ul style="list-style-type: none">➤ know and identify the basic structure of plants and trees, such as roots, bulbs, stem, leaf, flower, fruits, trunk, branch and crown➤ know and identify the common names of wild and garden plants➤ know and identify different trees in the locality, such as oak➤ know and explain the difference between evergreen and deciduous trees, including the influence of seasons	Plants (Biology)	<ul style="list-style-type: none">➤ know and explain what conditions are needed for seeds and bulbs to germinate and mature into plants➤ know and describe how plants need water, light and a suitable temperature to grow and stay healthy

Animals including humans (Biology)	<ul style="list-style-type: none"> ➤ know and explain what an animal is and what a plant is ➤ know and explain how seasons influence plants and animals ➤ know and identify a variety of common animals including fish, amphibians, reptiles, birds and mammals ➤ describe and compare the structure of this variety of common animals, including pets ➤ know, explain and group animals by the types of food they eat, as carnivores, herbivores and omnivores ➤ know and explain the places (habitats) that fish, amphibians, reptiles, birds and mammals live ➤ identify, name, draw and label the main body parts of the human body ➤ know the five senses, say which part of the body is associated with each and explain how they help compare different textures, sounds and smells 	Animals including humans (Biology)	<ul style="list-style-type: none"> ➤ know and explain that animals, including humans, have offspring which grow into adults ➤ know and explain simple life cycles of animals, including humans ➤ know and explain that animals need water, food and air to survive ➤ know and explain that to be healthy, humans need to exercise, eat the right amounts of different types of food and keep clean
Seasonal changes (Physics)	<ul style="list-style-type: none"> ➤ know and explain the order of seasons ➤ know and explain the changes within each season including months of the year ➤ know different patterns of weather associated with the seasons e.g. how rain can occur in all seasons ➤ know that the earth rotates and describe how day length varies 	Living things and their habitats (Biology)	<ul style="list-style-type: none"> ➤ know and explain the common characteristic of living things, such as MRS GREN ➤ know and explain the difference between things that are living, dead and things that have never been alive ➤ know and explain what a habitat is, why plants and animals that live there are best suited to it, and how they depend on each other ➤ know and identify a variety of plants and animals in their habitats, including microhabitats ➤ know and explain what an animal is and how they get their food from other plants and animals ➤ know and explain what a simple food chain is, including different sources of food and the direction of energy
Everyday materials (Chemistry)	<ul style="list-style-type: none"> ➤ distinguish between an object and the material from which it is made ➤ identify and name a variety of everyday materials, e.g. wood, plastic, glass, metal, water, rock ➤ know and explain the difference between an object and the material from which it is made, such as metal and a spoon ➤ know and explain the properties of a variety of everyday materials, such as hard / soft, stretchy, / stiff, rough / smooth, bendy / rigid, waterproof /not waterproof, absorbent / not absorbent, opaque / translucent / transparent ➤ know, explain and group a range of everyday materials depending using simple physical properties 	Everyday materials (Chemistry)	<ul style="list-style-type: none"> ➤ know and explain some properties of everyday materials ➤ know, compare and explain the properties and suitability of everyday materials for particular uses, such as glass in windows or bricks for building – identifying what is suitable or unsuitable ➤ know and explain how the shape of everyday materials can be changed, for example by squashing, bending, twisting and stretching ➤ explain how significant scientists have made useful things from knowing about the properties of materials, such as Charles Macintosh

Year 3		Year 4	
Plants (Biology)	<ul style="list-style-type: none"> ➤ know and identify the structure of the different parts of flowering plants: roots, stem/trunk, leaves and flowers ➤ know and explain the function of the parts of flowering plants ➤ know and explain what plants need to live and grow, such as air, light, water, nutrients from soil and space to grow, and how they vary from plant to plant ➤ investigate how water is transported within plants and explain the process of transpiration ➤ know and explain the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal 	Living things and their habitats (Biology)	<ul style="list-style-type: none"> ➤ know and explain that living things can be grouped in a variety of ways, such as vertebrate or invertebrate and flowering and non-flowering plant ➤ know, use and explain the classification of vertebrates, such as fish, amphibians, reptiles, birds and mammals ➤ know, use and explain the classification of invertebrates, such as snails and slugs, worms, spiders and insects ➤ know and use classification keys to group, identify and name a variety of living things in their local environment ➤ know and explain the impact on living things if their habitat changes
Animals including humans (Biology)	<ul style="list-style-type: none"> ➤ know and explain that animals, including humans, need the right types and amounts of nutrition ➤ know and explain that animals only get nutrition from the food they eat – they cannot make their own food like plants ➤ know, identify and explain the purpose and function of the human skeleton, such as supporting the body, protecting the lungs and helping joints move ➤ know, identify and explain the purpose and function of the muscles such as skeletal, cardiac or smooth muscles ➤ know and explain the difference between vertebrates and invertebrates 	Animals including humans (Biology)	<ul style="list-style-type: none"> ➤ know and identify the parts of the human digestive system, such as the mouth, tongue, teeth, oesophagus, stomach, small and large intestine ➤ know and explain the simple functions of the parts of the human digestive system, such as the mouth, tongue, teeth, oesophagus, stomach, small and large intestine ➤ know and explain the different teeth that humans have and their simple functions ➤ know and explain the teeth that carnivores and herbivores have and why this is important for their diet ➤ know, construct and explain food chains ➤ know and identify producers, predators and prey in a food chain
Forces and magnets (Physics)	<ul style="list-style-type: none"> ➤ compare how objects move on different surfaces using friction and resistance to explain why ➤ know and explain the difference between contact and non-contact forces ➤ know and explain how magnets attract and repel each other ➤ know and explain how magnets attract some materials and not others ➤ use what they know about the properties of materials from KS1 to group everyday materials that are attracted to a magnet ➤ know and identify magnetic materials ➤ know and explaining that a magnet has two poles, and predict whether they will attract or repel each other, depending on which poles are facing each other 	Electricity (Physics)	<ul style="list-style-type: none"> ➤ know and explain that household appliances run on electricity from mains or batteries, giving examples ➤ know, identify and explain what a simple single loop circuit is (also known as a simple series electrical circuit) ➤ know, identify and explain the components of a single loop circuit, such as cells, wires, bulbs, switches and buzzer ➤ know and explain 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 ➤ know and explain that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a single loop circuit ➤ know and identify that some common conductors and insulators as well as associating metals with being good conductors ➤ know and explain that current is the flow of electricity through a circuit

Light (Physics)	<ul style="list-style-type: none"> ➤ know and explain that light is needed to see things ➤ know and explain that dark is the absence of light ➤ know and explain that light is reflected from surfaces and enters our eyes ➤ know that the light of the sun can be dangerous and how to protect their eyes ➤ know and explain that shadows are formed when light from a source is blocked by an opaque object ➤ observe patterns and explain how shadows change size 	Sound (Physics)	<ul style="list-style-type: none"> ➤ know and explain how sounds are made through vibrations and travel as waves ➤ know and explain how sounds travel through a medium, such as a solid (wood), a liquid (water) or gas (air) ➤ know and explain how sounds travel through a medium to the ear as vibrations ➤ know and explain that sound is the transfer of energy ➤ know and explain what pitch means – frequency of the sound wave ➤ know and explain what loudness means – the size of the sound wave ➤ know, identify and explain patterns between the pitch of a sound and the features of the object that produced it, such as the length of an elastic band ➤ know, identify and explain patterns between the volume of a sound and the strength of the vibrations that produced it, such as the bang of a drum ➤ know and explain that sounds get fainter as the distance from the sound source increases
Rocks (Chemistry)	<ul style="list-style-type: none"> ➤ know and explain that rocks can be grouped together on the basis of their appearance and simple physical properties ➤ know and explain how rocks are formed ➤ know and explain what a rock is and what is not a rock ➤ know and explain different types of rock, such as igneous, sedimentary and metamorphic rock ➤ know and explain how fossils of animals and plants are formed when things that have lived are trapped in the rock ➤ know and explain the different types of fossils, including body and trace fossil ➤ know and explain the different types of material that make up soil, including rocks and organic matter 	States of matter (Chemistry)	<ul style="list-style-type: none"> ➤ know and explain what matter and state means ➤ observe simple models that explain what particles are ➤ know and explain the difference between solids, liquids and gases, such as solids hold their shape, liquids form a pool not a pile and gases escape from an unsealed container ➤ compare and group materials according to whether they are solids, liquids or gases ➤ observe and know that some materials change state when they are heated or cooled, such as water evaporating or butter melting ➤ know and use Celsius as a measure of temperature ➤ know and explain the part played by evaporation and condensation in the water cycle ➤ observe, know and explain how the rate of evaporation is associated with temperature

Year 5		Year 6	
Animals including humans (Biology)	<ul style="list-style-type: none"> ➤ know, describe and explain the changes humans go through to old age ➤ know and use a timeline to show stages of growth and development of humans, including puberty ➤ know, compare and explain the difference in gestation periods of humans to other animals, such as an elephant or butterfly 	Animals including humans (Biology)	<ul style="list-style-type: none"> ➤ know, identify and explain the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood ➤ know and use the terms: aorta, pulmonary vein, left atrium, right atrium, left ventricle, right ventricle, arteries, veins and capillaries, oxygenated and deoxygenated ➤ know, identify and explain the components and function of blood, such as plasma, red blood cells, white blood cells, platelets, nutrients and oxygen ➤ know and explain the impact of diet, exercise, drugs and lifestyle on the way their bodies function ➤ know, describe and explain the ways in which nutrients and water are transported within animals, including humans ➤ know and explain how significant scientists helped us understand more about the circulatory system, such as Galen or William Harvey
Living things and their habitats (Biology)	<ul style="list-style-type: none"> ➤ know, identify and explain the differences in the life cycles of a mammal (dog), an amphibian (frog), an insect (ladybird) and a bird (chicken) ➤ know and explain the life process of reproduction in some plants and animals ➤ know and explain about a significant scientist, such as Maria Merion who David Attenborough described as one of the most important contributors to entomology 	Living things and their habitats (Biology)	<ul style="list-style-type: none"> ➤ know and explain 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 ➤ know and identify the five major kingdoms of living things, including plant, animal, fungi, algae, slime and mould, and bacteria ➤ know and explain how significant scientists, such as Aristotle or Carl Linnaeus, helped us understand more about classification ➤ know, use and explain taxonomy ➤ know and explain reasons for classifying plants and animals based on specific characteristics, such as vertebrates or invertebrates ➤ know and use classification systems and keys to identify some animals and plants in the immediate environment ➤ know how to classify animals and plants they are unfamiliar with using a classification system

Forces (Physics)	<ul style="list-style-type: none"> ➤ know and explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object ➤ know, identify and explain the effects of air resistance, water resistance and friction, that act between moving surfaces, such as a parachute or a brake on a bike ➤ know and explain how significant scientists, such as Isaac Newton or Galileo Galilei helped develop the theory of gravitation ➤ know, experience and explain how the effect of friction on movement slows or stops moving objects ➤ know and explain that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect known as a force multiplier ➤ know and experience how levers, pulleys and gears multiply a smaller force to achieve a greater effect, such as removing a nail using a claw hammer, making simple pulleys and gears on a bike 	Evolution and inheritance (Biology)	<ul style="list-style-type: none"> ➤ know and explain that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago, such as body fossils, mould fossils, cast fossils and trace fossils ➤ know and explain that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents ➤ know, identify and explain how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution ➤ know and explain about significant scientists who have helped us understand the theory of evolution, such as Alfred Wallace and Charles Darwin
Earth in space (Physics)	<ul style="list-style-type: none"> ➤ know and identify the eight planets in our solar system - Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune ➤ know and identify Pluto as a dwarf planet ➤ know, identify and explain the movement of the Earth and other planets, relative to the Sun in the solar system ➤ know and explain the movement of the Moon relative to the Earth ➤ know and explain that a moon is a celestial body that orbits a planet, such as the Moon around Earth or the four large moons of Jupiter - Io, Europa, Ganymede and Callisto first seen by Galileo Galilei ➤ know and explain that the Sun, Earth and Moon are approximately spherical bodies ➤ know about Earth's rotation to explain day and night and the apparent movement of the sun across the sky 	Electricity (Physics)	<ul style="list-style-type: none"> ➤ know and explain how a single loop circuit (series circuit) works ➤ know and explain how the brightness of a lamp or the volume of a buzzer is affected by the number and voltage of cells used in a circuit ➤ know, use and explain the reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches ➤ know and use recognised symbols when representing a simple circuit in a diagram ➤ know and explain how to be safe when working with electricity

Properties and changes of materials (Chemistry)	<ul style="list-style-type: none"> ➤ know, identify and group the properties of everyday materials, such as hardness, solubility, transparency, conductivity (electrical and thermal) and response to magnets ➤ know and explain how some materials dissolve in liquid to form a solution ➤ know and describe how to recover a substance from a solution ➤ know and use their knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating ➤ know and explain, by giving reasons based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic ➤ know and explain how dissolving, mixing and changes of state are reversible changes ➤ know and explain that some changes result in the formation of new materials that are not usually reversible, such as burning and the action of acid 	Light (Physics)	<ul style="list-style-type: none"> ➤ know and explain that light appears to travel in straight lines ➤ know that light travels in straight lines to explain how objects are seen because they give out or reflect light into the eye ➤ know and 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 ➤ know that light travels in straight lines to explain why shadows have the same shape as the objects that cast them
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National curriculum objectives/ELG are highlighted in bold.