

Mansfield Primary Academy- Science Curriculum 22-23

Throughout Science at Mansfield Primary Academy, we teach children to stimulate their curiosity through an interactive and practical curriculum incorporating four key concepts: work scientifically, physics, biology and chemistry.

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
1	Seasonal Changes (Autumn and Winter) <ul style="list-style-type: none"> - Observe changes across the 4 seasons - Observe and describe weather associated with the seasons and how day length varies 	Animals Including Humans <ul style="list-style-type: none"> - 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 - 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 	Materials <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, including wood, plastic, glass, metal, water, and rock - 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 	Seasonal Changes (Spring and Summer) <ul style="list-style-type: none"> - Observe changes across the 4 seasons - Observe and describe weather associated with the seasons and how day length varies 	Plants <ul style="list-style-type: none"> - 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 	Scientists and Inventors <ul style="list-style-type: none"> - To describe the simple physical properties of a variety of everyday materials - To use observations to suggest answers to questions - To ask simple questions and use simple secondary sources to find answers - To perform simple tests
2	Living Things and Their Habitat <ul style="list-style-type: none"> - 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 	Animals including Humans <ul style="list-style-type: none"> - 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 	Uses of Everyday Materials <ul style="list-style-type: none"> - 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 - 	The Environment <ul style="list-style-type: none"> - Set up a simple test. - Measure and record the time taken for ice to melt. - Sort objects into groups. - Generate questions about the rainforest. - Sort rainforest animals into groups. - Ask questions about endangered animals. 	Plants <ul style="list-style-type: none"> - 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. 	Scientists and Inventors <ul style="list-style-type: none"> - Discuss whether doctors are scientists - Describe when and why we should wash our hands - Take part in an activity to show how germs spread - give a minimum of two facts about Charles Macintosh - identify Charles Macintosh's famous invention

	<p>habitats, including microhabitats</p> <ul style="list-style-type: none"> - 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 					<ul style="list-style-type: none"> - give facts about Rachel Carson - take part in an investigation to prove what Rachel Carson found out about water pollution - answer questions about where our energy comes from.
3	<p>Forces and Magnets</p> <ul style="list-style-type: none"> - Compare how things move on different surfaces - Notice that some forces need contact between 2 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 2 poles - Predict whether 2 magnets will attract or repel each other, depending on which poles are facing 	<p>Rocks</p> <ul style="list-style-type: none"> - Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties - Describe in simple terms how fossils are formed when things that have lived are trapped within rock - Recognise that soils are made from rocks and organic matter 	<p>Light</p> <ul style="list-style-type: none"> - 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 - Recognise that light from the sun can be dangerous and that there are ways to protect their eyes - Recognise that shadows are formed when the light from a light source is blocked by an opaque object - Find patterns in the way that the size of shadows change - 	<p>Animals including Humans</p> <ul style="list-style-type: none"> - Identify that animals, 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 <p>Identify that humans and some other animals have skeletons and muscles for support, protection and movement</p>	<p>Plants</p> <ul style="list-style-type: none"> - 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 - Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal - 	<p>Scientists and Inventors</p> <ul style="list-style-type: none"> - give the names of four people who brought new plants to Britain; - give four facts about Marie Curie's life and work; - explain how scientists use fossils to date rocks today; - describe how William Smith found fossils; - match fossils to time periods; - give four facts about Inge Lehmann's life and work; - identify concave and convex mirrors as curved mirrors; - participate in an investigation into convex and concave mirrors; - identify devices and inventions that use curved mirrors; - describe electromagnets as magnets powered by electricity; - describe how the first electromagnets were developed and name a scientist who worked on them; - recognise that inventions and

						<p>discoveries come from all over the world;</p> <ul style="list-style-type: none"> - give an example of how some things are invented to make people's lives easier
4	<p>Animals Including Humans</p> <ul style="list-style-type: none"> - 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 - Construct and interpret a variety of food chains, identifying producers, predators and prey 	<p>Electricity</p> <ul style="list-style-type: none"> - 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 - 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 	<p>States of Matter</p> <ul style="list-style-type: none"> - Compare and group materials together, according to whether they are solids, liquids or gases - 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) - Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature 	<p>Sound</p> <ul style="list-style-type: none"> - Identify how sounds are made, associating some of them with something vibrating - Recognise that vibrations from sounds travel through a medium to the ear - Find patterns between the pitch of a sound and features of the object that produced it - Find patterns between the volume of a sound and the strength of the vibrations that produced it - Recognise that sounds get fainter as the distance from the sound source increases 	<p>Living Things and Their Habitat</p> <ul style="list-style-type: none"> - Recognise that living things can be grouped in a variety of ways - Explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment - Recognise that environments can change and that this can sometimes pose dangers to living things. 	<p>Scientists and Inventors</p> <ul style="list-style-type: none"> - investigate and describe the dangers of deforestation in Madagascar with some support; - with support, pick out key facts about Alexander Graham Bell's life and work and present findings to a group; - with support, describe the achievements of Maria Telkes - discuss the achievements of Garrett Morgan - with prompts, sort facts about the scientists who discovered oxygen and explain the effect of oxygen on burning; - with support, explore Lord Kelvin's work, - with support, explain how inventions by inventors, such as Thomas Edison and Lewis Latimer, changed people's lives; - with support, explore the invention of toothpaste and compare the effectiveness of different toothpastes
5	<p>Properties and Materials</p> <ul style="list-style-type: none"> - compare and group together everyday materials on the basis of their properties, including their hardness, 	<p>Earth and Space</p> <ul style="list-style-type: none"> - describe the movement of the Earth and other planets 	<p>Forces</p> <ul style="list-style-type: none"> - explain that unsupported objects fall towards the Earth because of the force of gravity acting between 	<p>Living Things and Their Habitat</p> <ul style="list-style-type: none"> - describe the differences in the life cycles of a 	<p>Animals including Humans</p>	<p>Scientist and Inventors</p> <ul style="list-style-type: none"> - explain whether evidence supports or refutes ideas;

	<p>solubility, transparency, conductivity (electrical and thermal), and response to magnets</p> <ul style="list-style-type: none"> - know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution - use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating - 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 	<p>relative to the sun in the solar system</p> <ul style="list-style-type: none"> - 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 	<p>the Earth and the falling object</p> <ul style="list-style-type: none"> - identify the effects of air resistance, water resistance and friction, that act between moving surfaces - recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect 	<p>mammal, an amphibian, an insect and a bird</p> <ul style="list-style-type: none"> - describe the life process of reproduction in some plants and animals 	<ul style="list-style-type: none"> - Describe the changes as humans develop to old age 	<ul style="list-style-type: none"> - identify a mixture by analysing its components; - explain how Margaret Hamilton's software inventions changed the way computer programmes were used; - explain Neil deGrasse Tyson's ideas about Pluto; - record their results accurately and explain what they show; - use their results to make new predictions; - describe the life cycle of bees; - order facts about Stephanie Kwolek's life; - identify evidence that supports or refutes the idea that Stonehenge was used as an astronomical calendar;
6	<p>Animals Including Humans</p> <ul style="list-style-type: none"> - identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood - recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function 	<p>Light</p> <ul style="list-style-type: none"> - 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 	<p>Electricity</p> <ul style="list-style-type: none"> - 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 	<p>Living Things and Their Habitats</p> <ul style="list-style-type: none"> - 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 	<p>Evolution and Inheritance</p> <ul style="list-style-type: none"> - recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago - recognise that living things produce offspring of the same kind, but 	<p>Scientists and Inventors</p> <ul style="list-style-type: none"> - share facts about Stephen Hawking's life and work; - set up an enquiry into the effects of black holes; - draw a diagram of their observations from an enquiry into black holes;

- describe the ways in which nutrients and water are transported within animals, including humans	- use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them	from light sources to objects and then to our eyes	- buzzers and the on/off position of switches - use recognised symbols when representing a simple circuit in a diagram	- give reasons for classifying plants and animals based on specific characteristics -	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	- give facts about Libbie Hyman's life and work; - describe Alexander Fleming's discovery of penicillin; - construct a scatter graph from a table of results; - sort facts about Mary Leakey's life and work; - describe the fossils found by Mary Leakey; - answer questions about Steve Jobs' life and work;
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EYFS- Early Learning Goal for Understanding the World

ELG 15 The Natural World

- Explore the natural world around them, making observations and drawing pictures of animals and plants.
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
- Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Progression of Skills

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically	Observe closely, using simple equipment.	Use observations, ideas and gather and record data to suggest answers to questions.	Set up simple, practical enquires and comparative and fair tests.	Use straight forward, scientific evidence to answer questions or to support their findings.	Use appropriate techniques, apparatus and materials during fieldwork and laboratory work.	Use test results and simple models to describe scientific ideas, identifying scientific evidence that has been used to support or refute ideas and arguments.
Understanding Plants	Identify and describe the basic structure of a variety of common flowering plants, including roots, stem/trunk, leaves and flowers.	Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.	Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant.			

<p>Animals Including Humans</p>	<p>Describe and compare the structure of a variety of common animals.</p> <p>Identify name, draw and label the basic parts of a human body and say which part of the body is associated with each sense.</p>	<p>Describe the importance of exercise, eating the right amounts of different types of foods and hygiene.</p>	<p>Construct and interpret a variety of food chains, identifying producers, predators and prey.</p>	<p>Identify the different types of teeth in humans and their simple functions.</p>	<p>Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.</p>	<p>Describe the ways in which nutrients and water are transported within animals, including humans.</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p>
<p>Investigating Living Things</p>	<p>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.</p>	<p>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.</p>	<p>Recognise that living things can be grouped in a variety of ways</p>	<p>Recognise that environments can change and that this can sometimes pose dangers to specific habitats</p>	<p>Describe the life process of reproduction in some plants and animals.</p>	<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p>
<p>Investigating Materials</p>	<p>Distinguish between an object and the material from which it is made.</p> <p>Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock.</p>	<p>Find out how the shapes of solid objects made from materials can be changes by squashing, bending, twisting and stretching.</p> <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick/rock, and</p>	<p>Relate the simple physical properties of some rocks to their formation (igneous or sedimentary).</p>	<p>Observe that some materials change state when they are heated or cooled and measure the temperature at which this happens in degrees Celsius (°C), building on their teaching in mathematics.</p>	<p>Understand how some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution.</p> <p>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating.</p>	<p>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, oxidation and the action of acid on bicarbonate of soda.</p>

		paper/cardboard for uses.				
Electricity, Forces and Magnets			<p>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.</p> <p>Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p>	<p>Identify common appliances that run on electricity.</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether a lamp lights in a simple series circuit.</p>	<p>Investigate whether two magnets attract repel.</p> <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p>	<p>Use recognised symbols when representing a simple circuit in a diagram.</p>
Understanding Sound and Light	Observe and name a variety of sources of light, including electric lights, flames and the Sun.		<p>Identify how sounds are made. Associating some of the sounds with something vibrating.</p> <p>Notice that light is reflected from surfaces.</p>	<p>Find patterns in the way that the size of shadows changes.</p> <p>Recognise that vibrations from sounds travel through a medium to the ear.</p>	<p>Describe the movement of the Moon relative to the Earth.</p>	<p>Recognise that sounds get fainter as the distance from the sound source increasing.</p> <p>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.</p>

Progression of Vocabulary						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Understanding Plants	Deciduous, Evergreen trees, Leaves, Flowers (blossom), Petals, Fruit, Roots, Bulb, Seed, Trunk, Branches, Stem	Seeds, Bulbs, Water, Light, Temperature, Growth	Air, Light, Water, Nutrients, Soil, Reproduction, Transportation, Dispersal, Pollination, Flower			
Animals including Humans	Fish, Reptiles, Mammals, Birds, Amphibians (+ examples of each) Herbivore, Omnivore, Carnivore, Leg, Arm, Elbow, Head, Ear,	Survival, Water, Air, Food, Adult, Baby, Offspring, Kitten, Calf, Puppy, Exercise, Hygiene	Movement, Muscles, Bones, Skull, Nutrition, Skeletons,	Mouth, Tongue, Teeth, Oesophagus, Stomach, Small Intestine, Large Intestine, Herbivore, Carnivore, Canine, Incisor, Molar	Foetus, Embryo, Womb, Gestation, Baby, Toddler, Teenager, Elderly, Growth, Development, Puberty	Circulatory, Heart, Blood Vessels, Veins, Arteries, Oxygenated, Deoxygenated, Valve, Exercise, Respiration

Living Things and Their Habitats		Living, Dead, Habitat, Energy, Food chain, Predator, Prey, Woodland, Pond, Desert		Vertebrates, Fish, Amphibians, Reptiles, Birds, Mammals, Invertebrates, Snails, Slugs, Worms, Spiders, Insects, Environment, Habitats	Mammal, Reproduction, Insect, Amphibian, Bird, Offspring	Classification, Vertebrates, Invertebrates, Micro-organisms, Amphibians, Reptiles
Everyday Materials	Wood, Plastic, Glass, Paper, Water, Metal, Rock, Hard, Soft, Bendy, Rough, Smooth	Hard, Soft, Stretchy, Stiff, Shiny, Dull, Rough, Smooth, Bendy, Waterproof, Absorbent, Opaque, Transparent Brick, Paper, Fabrics, Squashing, Bending, Twisting, Stretching Elastic, Foil	Fossils, Soils, Sandstone, Granite, Marble, Pumice, Crystals, Absorbent	Solid, Liquid, Gas, Evaporation, Condensation, Particles, Temperature, Freezing, Heating	Hardness, Solubility, Transparency, Conductivity, Magnetic, Filter, Evaporation, Dissolving, Mixing	Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics
Understanding Sound and Light	Summer, Spring, Autumn, Winter, Sun, Day, Moon, Night, Light, Dark		Light, Shadows, Mirror, Reflective, Dark, Reflection	Volume, Vibration, Wave, Pitch, Tone, Speaker	Earth, Sun, Moon, Axis, Rotation, Day, Night, Phases of the Moon, star, constellation	Refraction, Reflection, Light, Spectrum, Rainbow, Colour,
Forces and Electricity			Magnetic, Force, Contact, Attract, Repel, Friction, Poles, Push, Pull	Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators	Air resistance, Water resistance, Friction, Gravity, Newton, Gears, Pulleys	Cells, Wires, Bulbs, Switches, Buzzers, Battery, Circuit, Series, Conductors, Insulators, Amps, Volts, Cell