

Science Progression of Substantive Knowledge

EYFS and KS1

PHASE	Cycle Year	Working scientifically	Animals including humans	Living things and their habitats	Plants	Materials and properties	Seasonal Changes
Rec/Y1/Y2	A	Ask questions Collect data Observe Notice patterns Record findings Possible investigations Sorting keys/hoops for different animals (minibeasts) Which material is best for ... (an umbrella) materials Weather diaries (weather and seasons)	My brilliant body (to include RSHE) <ul style="list-style-type: none"> Recognise and compare main external parts of the human body Describe other animals and what they look like Importance of hygiene, washing hands, cleaning teeth, showering 	Marvellous minibeasts <ul style="list-style-type: none"> Sort animals on observed characteristics Explain difference between animals including fins, arms, skin, feathers, scales etc... Know that some animals are carnivores/herbivores and omnivores Identify that most living things have a habitat Explore simple food chains and interdependence within a habitat 	Growth and care <ul style="list-style-type: none"> Observe and describe how seeds and bulbs grow into mature plants Explore the importance of water, light and temperature for plants to grow and stay healthy. 		Weather and seasons <ul style="list-style-type: none"> Observe changes across the four seasons Observe and describe weather associated with the seasons Observe and describe how day length varies
	B	Ask questions Collect data Observe Notice patterns Record findings Possible investigations Observation – Let it grow	Growth <ul style="list-style-type: none"> Understand animals have offspring that grow into adults Compare differences between animals and how they grow Explore simple life cycle of a human (baby/toddler/child/adolescent/adult) Diet and health <ul style="list-style-type: none"> Explore basic needs of animals for survival (water, food, air) Importance of exercise for health To begin to know which foods are good for us and what can make us unwell Understand how medicine can make us better 			Exploring uses everyday materials <ul style="list-style-type: none"> Know the difference between an object and its material Name a variety of materials Describe simple physical properties of everyday materials Compare and group everyday materials based on simple physical properties Explore suitability of everyday materials use particular uses Find out how the shapes of solid objects can be changed 	
	C	Ask questions Collect data Observe Notice patterns Record findings Possible Investigations Collecting – totally natural Changes in shape of dough, when dropping it (forces)	Senses <ul style="list-style-type: none"> Identify, name and draw basic body parts associated with each of our senses Explore sense of smell, taste, touch, sight and hearing 	Animals <ul style="list-style-type: none"> Identify differences between what is alive, dead and never been alive Explore habitats, discussing adaptations can a polar bear live in a forest? 	Introduction to Plants <ul style="list-style-type: none"> Identify and name a variety of common plants and trees Identify and describe the basic structure of a flowering plant and tree 	Forces and fun (machines/toys) <ul style="list-style-type: none"> To compare how different things move Notice and describe how things are moving, slowly, quickly Sort objects (toys) according to how they move Identify pushes, pulls and twists Identify pushes and pulls in the classroom 	

Science Progression of Substantive Knowledge

KS2 lower

PHASE	Cycle Year	Working scientifically	Animals including humans	Living things and their habitats	Plants	Materials and properties	States of matter	Electricity
3/4	A	<p>Ask questions</p> <p>Collect data</p> <p>Observe</p> <p>Notice patterns</p> <p>Record findings</p> <p>Possible investigations</p> <p>What happens if a plant has no leaves?</p> <p>What happens to our teeth if they are not cleaned? (eggs different drinks)</p> <p>Celery in food colouring to explore how water moves around a plant (plants)</p>	<p>Life cycles (to include RSHE)</p> <ul style="list-style-type: none"> Identify what a life cycle is Explore life cycle of plant Explore life cycle of frog/butterfly looking at metamorphosis Explore how humans change over their life time How do animals reproduce including egg laying, live birth and metamorphosis <p>Food and digestion and Bones – How do we move? Teeth</p> <ul style="list-style-type: none"> Identify that humans and some animals have skeletons and muscles for support, protection and movement (The human skeleton) (Joints and muscles) Identify animals, including humans need the right types of nutrition (Diet and exercise) That they can't make their own food and get nutrition from what they eat Describe simple functions of digestive system (The digestive system) Identify different types of teeth in humans and their functions. (teeth) 	<p>Classifying living things and their habitats (to include RSHE)</p> <ul style="list-style-type: none"> Construct and interpret a variety of food chains, identifying producers, consumers, predators and prey (Food chains) Understand how to group living things and identify them using classification keys (Classifying living things) Recognise how changes in the environment affect living things 	<p>Helping plants grow well</p> <ul style="list-style-type: none"> Explore what green plants need to stay alive Study the importance of leaves Study importance of roots (how water is transported) To name parts of the flower and what they do (Parts of a plant) Explore germination/pollination /seed dispersal (Reproduction and Fertilisation and dispersal) 	<p>Forces and magnets</p> <ul style="list-style-type: none"> Understand that force is push, pull or a combination creating a twist (What is force?) Compare how things move on different surfaces (friction) Observe how magnets attract and repel (Magnetism) Describe poles in terms of magnets <p>Rocks and soils</p> <ul style="list-style-type: none"> Compare and group different kinds of rocks (sedimentary, metamorphic and igneous) (Rocks) Describe how fossils are formed Recognise that soils are made from rocks and organic matter (Soil) 		
	B	<p>Ask questions</p> <p>Collect data</p> <p>Observe</p> <p>Notice patterns</p> <p>Record findings</p> <p>Possible investigations</p> <p>Find patterns in how shadows can change/plot movement throughout the day (light)</p> <p>Create own water cycles (solids, liquids and gasses)</p>				<p>Light and sound</p> <ul style="list-style-type: none"> Recognise that light is needed to see things (What is light?) To understand that light is reflected from surfaces (Reflection) Know that shadows form when light is blocked (Shadows) Recognise that light from sun is dangerous and we must protect our eyes Identify how sound is made (What is sound?) Understand how sound travels (waves) (Changing pitch and 	<p>Solids, liquids and gases</p> <ul style="list-style-type: none"> Compare and group materials together, according to their state (Solid, liquid and gas) Observe changes of state due to heating and cooling (Changes of state) (Separation by evaporation) Understand the impact of temperature in the water cycle 	<p>Electricity</p> <ul style="list-style-type: none"> Identify appliances that run on electricity Construct simple series electrical circuits, identifying and naming parts (Series and parallel circuits) Identify if a circuit would allow electricity to flow To understand and recognise common conductors and insulators (Conductors and dangers of electricity)

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	Creating complete circuits investigating materials that are conductors or insulators (electricity)					how does sound travel?)	
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Upper KS2

PHASE	Cycle Year	Working scientifically	Animals including humans	Living things and their habitats	Plants	Materials and their properties	Earth and space	Electricity
5/6	A	Ask questions Collect data Observe Notice patterns Record findings Possible investigations Moon dairy Total eclipse of my lid Candle with care	Human life cycles (to include RSHE) <ul style="list-style-type: none"> Describe changes as humans develop to old age (Life Cycles) Describe the life processes of reproduction in some plants and animals (Reproduction) 	Living things and their habitats <ul style="list-style-type: none"> Describe the differences in life cycles between mammal, amphibian, insect and bird (Life Cycles) Explore habitat destruction and its impact on animals Describe how living things are classified into groups according to common observable characteristics, including micro-organisms (Why classify?) Give reasons for classifying animals (Classification Keys) 		Light <ul style="list-style-type: none"> Recognise that light appears to travel in straight lines (What is light?) Explain that light travels from a source, to our eyes or from a source to an object and then to our eyes. Use this idea to link to how we see by reflection To know that shadows are the same shape as the objects that cast them (The sun as a light source) To recognise the differences between transparent, opaque and translucent 	<ul style="list-style-type: none"> Begin to observe the changes over time of the movements of the Moon relative to Earth. Understand what the Solar System is (Solar System) Explain day and night (Sun and Earth) Understand what a constellation is. (Beyond the solar system) Draw conclusions from the observations of changes over time relating to the movements of the Moon relative to Earth. (The Moon) 	<ul style="list-style-type: none"> Use recognised symbols when drawing circuit diagrams Compare and give reasons for variations in how components function, including brightness of bulbs, the loudness of buzzers (Electrical circuits?) Discuss voltage and cells
	B	Ask questions Collect data Observe Notice patterns Record findings Possible investigation Filtering mixtures coffee, sugar, water Sand, mud, water Utterly gene-ius	Heart and Health, Blood and transportation <ul style="list-style-type: none"> Identify and name the main parts of the human circulatory (The circulatory system) 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 	Evolution and inheritance <ul style="list-style-type: none"> Recognise that living things produce offspring of the same kind (Reproduction) Recognise that living things have changed over time Fossils provide information about living things millions of years ago Adaptations lead to evolution (Adaptation and evolution) 	Plants <ul style="list-style-type: none"> Describe the ways in which nutrients and water are transported within plants Explore habitat destruction and its impact on plants Describe how living things are classified into groups according to common observable characteristics, including plants Give reasons for classifying plants Identify how plants are pasted to suit their environment in different ways 	Plants <ul style="list-style-type: none"> Describe the ways in which nutrients and water are transported within plants Explore habitat destruction and its impact on plants Describe how living things are classified into groups according to common observable characteristics, including plants Give reasons for classifying plants Identify how plants are pasted to suit their environment in different ways 	Forces <ul style="list-style-type: none"> Explain the force of gravity and impact on a falling object (Gravity) Identify effects of air resistance, water resistance and friction (Friction) Recognise that some mechanisms, including levers, pulleys and gears allow a smaller force to have a greater effect (Gears and pulleys) 	

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						<ul style="list-style-type: none"> • Understand that some materials are soluble and recover a substance from a solution • Using knowledge of solids, liquids and gases to decide how mixtures can be separated. Using sieving, filtering, evaporating • Demonstrate reversible changes and explain that some changes are irreversible (Changes of state) 		
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