

Long term Plan for Science 2023/2024

Phase	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	<p>Our Early Years curriculum has been designed using the statutory educational programmes of study and the development matters to ensure that all children are equipped with knowledge and skills to achieve expected in the Early Learning Goals that link to Science. The following Early Learning Goals link to Science:</p> <p>Communication and Language (Listening, Attention and Understanding)</p> <ul style="list-style-type: none"> • Make comments about what they have heard and ask questions to clarify their understanding. <p>Personal, Social and Emotional Development (Managing Self)</p> <ul style="list-style-type: none"> • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. <p>Understand the World (The Natural World)</p> <ul style="list-style-type: none"> • Explore the natural world around them, making observations and drawing pictures of animals and plants. • Know some similarities and difference between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class. • Understand some importance processes and changes in the natural world around them, including the seasons and changing states of matter. <p>Throughout the year, the children will observe and talk about the changes that they can see in their local environment including the weather, trees, plants and animals.</p>					
Nursery	<p>Marvellous Me</p> <p>To know simple body parts such as head, shoulder, arm, leg, foot</p>	<p>Amazing Animals</p> <p>To know basic animals that live on a farm including pigs, cows and sheep *</p> <p>To know baby animals are sometimes known by different names to the adult *</p> <p>To know the names of some animals and their babies *</p> <p>To know some baby animals do not look like the adult. *</p> <p>To know the leaves fall off the trees in autumn</p>	<p>Amazing Animals</p> <p>To know dinosaurs lived a long time ago *</p> <p>To name at least two dinosaurs *</p> <p>To know some dinosaurs are big and some are small *</p> <p>To know polar bears and penguins live where it is cold *</p> <p>To know it is cold in the winter</p>	<p>Terrific Tales</p> <p>To begin to know some food that is healthy or unhealthy for them *</p> <p>To know in spring flowers start to grow</p>	<p>Off We Go!</p> <p>To know there are some different planets *</p> <p>To know in spring flowers start to grow</p>	<p>Come Outside!</p> <p>To know plants need water to help them to grow *</p> <p>To know the name of at least 3 minibeasts*</p> <p>To know the lifecycle of a butterfly *</p> <p>To know it is hot in the summer</p>

Linked to Science:

Children will know how to follow a simple recipe to make play dough

Children will make playdough using a range of materials and notice how it has changed state. To observe changes in playdough.

Children will know names of resources, how they can be used and will know the right resources to use for their chosen task/purpose

Children will know the name of some resources and equipment that may, in the future, link to Science experiments.

Children will know about their family, living in Barnsley and begin to know about how to look after things that are important to them e.g. pets, animals and the environment

Children will begin to know what animals need to survive and how to care for them.

Reception	<p>All About Me!</p> <p>To know the names of basic parts of the body and also other parts of the body including elbow, wrist, kneecap, ankle* To know it is important to stay healthy by eating a balanced diet, exercising, drinking enough water, getting enough sleep, following good hygiene.* To know we have five senses - taste, touch, sight, hearing, smell.* To know about the importance brushing their teeth. * To know there are 4 seasons are Autumn, Winter, Spring and Summer. To know about and recognise signs of autumn To know in Autumn some leaves change colour and start to fall off the trees.</p>	<p>Our Amazing World</p> <p>To know animals that live on a farm including basic such as pigs, cows and sheep and also other animals such as goat, geese, ducks, horses.* To know where animals live on the farm e.g. in a field / sty / barn * To know the names of farm animals and their babies * To know Dinosaurs are extinct** To know some dinosaurs are herbivores and eat plants* To know some dinosaurs are carnivores and eat meat* To know the names of at least 3 dinosaurs including T Rex* To know Dinosaur bones are known as fossils ** To know that some animals are nocturnal and this means they sleep during the day. * To know some nocturnal animals including bat, fox, hedgehog and owl*</p>	<p>Our Amazing World</p> <p>To know there are 8 Planets * To know the name of some planets* To know Neil Armstrong was the first man on the moon ** To know we live on the Earth* * To know there is more sea than land on earth. * To know Polar regions are cold, icy and have snow and not many plants grow there. * * To know Polar bears live in the arctic and penguins live in the Antarctic * To know Polar bears have a layer of fat to keep them warm* To know about and recognise signs of winter To know not much grows in Winter. It is cold and can be snowy and icy.</p>	<p>Once Upon a Time</p> <p>To know and talk about the lifecycle of a chick – egg, chick, hen * To know which materials are best to build houses and begin to understand why e.g. waterproof* To know about goats / pigs – where they live? What they like to eat? Any special features of the animals. *</p>	<p>Growing and Changing</p> <p>To know we have a responsibility to look after our world. ** To know plants grow from seeds or bulbs. * To know parts of a plant including roots, stems/stalks, leaves and flowers. * To know plants need light, warmth, water and food to grow * To know about and recognise signs of spring To know in Spring it starts to get warmer and things start to grow again.</p>	<p>Growing and Changing</p> <p>To know spiders have 8 legs. * To know insects have 6 legs and three body sections * To know the name of at least 3 minibeasts* To know some minibeasts have soft and slimy bodies, some have a shell and some have an exoskeleton * To know the lifecycle of a butterfly and a frog * To know what some animals that live in the sea and name at least 3* To know where we might find a lighthouse and what its job is To know in Summer it can be hot and lots of things grow.</p>
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<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Reception Curricular Goals</p>	<p style="text-align: center;">Children will know and understand hygiene rules and routines around toileting, eating, hand washing and brushing of teeth.</p> <p>Children will know about their health including germs, bacteria, healthy/unhealthy hygiene.</p> <p style="text-align: center;">Children will know about the world beyond Barnsley including countries, celebrations, animals and environments.</p> <p>Children will know about animals, environments and habitats. Children will begin to know how animals have made adaptations to their habitat.</p>			
	<p>(Biology) Seasonal Changes to be taught throughout the year through observations:</p> <ul style="list-style-type: none"> • Observe changes. • Describe weather associated with seasons. • Understand that the length of day changes throughout the year. <p>Guidance</p> <ul style="list-style-type: none"> • Make tables and charts about the weather after observing and talking about changes. • Make displays of what happens in the world around them including day length as the seasons change. <p>Key Scientists</p> <ul style="list-style-type: none"> • George James Symons (Meteorologist) • Anders Celsius (Astronomer, Physicist and Mathematician) 			
<p style="text-align: center;">KS1</p>	<p>(Biology) Living things and their habitats:</p> <ul style="list-style-type: none"> • Explore and compare difference between living and dead things. • Identify habitats that living things live in. • Know why some animals are more suited to certain habitats. • Understand that habitats provide a basic need. • Identify and name a variety of plants and animals in their habitats including micro habitats. • Know how animals get food from plants and animals. • Use a simple food chain. <p>Guidance:</p> <ul style="list-style-type: none"> • Compare animals living in familiar habitats with less familiar such as seashore, ocean, rainforest. 	<p>(Chemistry) Everyday Materials:</p> <p>Y1 Objectives</p> <ul style="list-style-type: none"> • Distinguish between an object and the material from which it is made • Identify and name materials such as wood, plastic, glass, metal, water and rock • Describe simple properties such as hard, soft, bumpy etc. 	<p>30th Anniversary of British Science Week 8-17th March 2024</p> <p>Theme: Time!</p> <p>(Chemistry) Everyday Materials:</p> <p>Y2 Objectives</p> <ul style="list-style-type: none"> • Identify and compare suitability of materials e.g. wood, metal, plastic, glass, brick, rock, paper and cardboard • Find out how the shape of 	<p>(Biology) Plants:</p> <p>Y1 Objectives</p> <ul style="list-style-type: none"> • Identify and name common wild and garden plants. • Identify and name deciduous and evergreen trees. • Identify and describe basic structure of common flowering plants and trees. <p>Y2 Objectives</p> <ul style="list-style-type: none"> • Observe how seeds and bulbs grow into plants. • Find out why plants need water, light and temperature. <p>Guidance:</p> <ul style="list-style-type: none"> • Plant structures include: leaves, flowers, petals, fruit, roots, bulb, seed, trunk, branches, stem.

	<ul style="list-style-type: none"> Identify plants and animals within a habitat and observe how they rely on each other. Sort and classify things by whether they are living, dead or never alive Construct a simple food chain e.g. grass, cow, human Observe conditions in different habitats and if they effect how many animals live there. <p>Key Scientists</p> <ul style="list-style-type: none"> Sylvia Earle (Marine Biologist) Sir Ernest Shackleton (Antarctic Explorer) 	<ul style="list-style-type: none"> Compare and group materials based on their properties. <p>Guidance:</p> <ul style="list-style-type: none"> Perform simple tests such as ‘What is the best material for an umbrella?’ Raise and answer questions about a range of everyday materials to become familiar Look at how one material can be used for more than one thing e.g. metal for coins, can, cars, table legs. Observe everyday material around school, identify and classify materials and record observations. <p>Key Scientists</p> <ul style="list-style-type: none"> Charles Mackintosh (waterproof coat) John Dunlop (inflatable rubber tyre) Ole Kirk Christiansen (creator of Lego) 	<p>objects can be changed by squashing, bending, twisting and stretching.</p>	<ul style="list-style-type: none"> Experiment growing seeds and bulbs in different environments and compare findings. Observe growth of plants they have planted by drawing diagrams and using magnifying glasses to look closely. Look at the local environment and see how plants grow. <p>Key Scientists</p> <ul style="list-style-type: none"> Beatrix Potter (Botanist and Natural Scientist) John Ray (Naturalist) Jane Colden (Botanist) Agnes Arber (Botanist) 		
LKS2	<p>(Physics) Electricity:</p> <ul style="list-style-type: none"> Identify appliances that run on electricity Construct a simple series circuit Identify and name cells, wires, bulbs, switches and buzzers Identify whether a lamp will light in a circuit if it is a 	<p>(Physics) Sound:</p> <ul style="list-style-type: none"> Identify how sound is made – vibrations. Know how vibrations travel. Understand how objects making sounds can affect pitch. Understand how volume depends on vibrations. 	<p>(Physics) Light:</p> <ul style="list-style-type: none"> Recognise you need light in order to see things and that dark is the absence of light Notice that light is reflected from surfaces Light from the sun can be dangerous and it is important to protect eyes 	<p>30th Anniversary of British Science Week 8-17th March 2024 Theme: Time!</p>	<p>(Biology) Plants:</p> <ul style="list-style-type: none"> Identify and describe functions of different parts of flowering plants: roots, stem, trunk, leaves, flowers Explore what a plant needs to grow: air, light, water, nutrients, room and how this varies. 	<p>(Biology) Animals including humans:</p> <p>Year 3 Objectives</p> <ul style="list-style-type: none"> Identify the right types of nutrition for animals and humans and that they get nutrition from what they eat. Identify skeletons and muscles for

	<p>complete loop with a battery</p> <ul style="list-style-type: none"> Recognise that a switch opens and closes a circuit and associate with lamps Recognise common conductors and insulators Associate metals with being good conductors. <p>Guidance</p> <ul style="list-style-type: none"> Construct simple series circuit using bulbs, buzzers, motors and switches. Create simple devices and draw as pictorial representation (it does not have to use the proper symbols) Observe patterns where the bulbs get brighter when more cells are added. Metals tend to be conductors. <p>Key Scientists</p> <ul style="list-style-type: none"> Hertha Ayrton (Engineer, Physicist and Inventor) 	<ul style="list-style-type: none"> Recognise sounds get fainter as distance increases. <p>Guidance</p> <ul style="list-style-type: none"> Use a range of musical instruments to explore vibrations. Find out how the pitch and volume can be changed Find patterns in the sounds that are made e.g. saucepan lids of different sizes or elastic bands of different thicknesses. Make earmuffs from a variety of materials to discover which gives the best insulation. Make and play their own instruments. <p>Key Scientists</p> <ul style="list-style-type: none"> James West (Inventor and Acoustician) (Microphones) Alexander Graham Bell (Inventor and Engineer) (Telephones) 	<ul style="list-style-type: none"> Shadows are formed when the light from a source is blocked by a solid object. Find patterns in the way that the size of shadows change. <p>Guidance</p> <ul style="list-style-type: none"> Play mirror games to explore what happens when light reflects off a mirror. Look for and measure shadows and find out what might cause them to change. Look for patterns when the light sources moves or the distance between the light source and object changes. <p>Key Scientists</p> <ul style="list-style-type: none"> Ibn al-Haytham (Alhazen) Lewis Latimer 		<ul style="list-style-type: none"> Investigate how water is transported in plants. Life cycle of flowering plants: pollination, seed formation and dispersal. <p>Guidance</p> <ul style="list-style-type: none"> Explore the relationship between structure and function. Roots and stem for nutrition and support, leaves for nutrition and flowers for reproduction. Explore the effect of different factors on plant growth: amount of light or fertiliser. Discover how seeds are formed Observe how water is transported by putting white carnations in coloured water. <p>Key Scientists</p>	<p>support, protection and movement.</p> <p>Year 4 Objectives</p> <ul style="list-style-type: none"> Know the basic parts of digestive system. Identify different teeth in humans and their functions. Construct and interpret food chains using producers, predator and prey. <p>Guidance</p> <ul style="list-style-type: none"> Identify and group animals with and without skeletons and observe their movement. What would happen if humans didn't have skeletons? Group animals based on what they eat. Design healthy meals. <p>Key Scientists</p> <ul style="list-style-type: none"> Marie Maynard Daly (Biochemist studied cholesterol, super, protein) Pierre Fauchard (father of modern dentistry)
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	<ul style="list-style-type: none"> Joseph Swan (Physicist, Chemist and Inventor) 				<ul style="list-style-type: none"> Stephen Hales (Botanist) Anna Atkins (Botanist) 	
UKS2	<p>(Biology) Evolution and Inheritance:</p> <ul style="list-style-type: none"> Living things have changed over time and fossils give us information about living things from millions of years ago. Adults produce offspring that normally differ to their parents. Identify how animals have adapted to their environment and how this leads to evolution. <p>Guidance</p> <ul style="list-style-type: none"> Builds on Rocks from Y3. Characteristics are passed on from parents. What happens when a Labrador breeds with a poodle? Explore how giraffe's necks get longer Explore development of insulating fur on the arctic fox. 	<p>(Physics) Light:</p> <ul style="list-style-type: none"> Recognise that light travels in straight lines. Explain how light reflects in the eye. Explain that we see objects because of light sources. Understand why shadows have the same shapes as objects that cast them. <p>Guidance</p> <ul style="list-style-type: none"> Build on Y3 Explore how light behaves with light sources, reflection and shadows Decide where to place rear-view mirrors Design and make a periscope Use shadow puppets Investigate rainbows, soap bubbles, objects in 	<p>(Physics) 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 buzzers and the on/off position of switches. Use recognised symbols when representing a simple circuit. <p>Guidance</p> <ul style="list-style-type: none"> Build on Y4 Construct simple series circuits to answer questions about what happens when they try different components 	<p>30th Anniversary of British Science Week 8-17th March 2024 Theme: Time!</p>	<p>(Biology) Living Things and their Habitats:</p> <p>Y5 objectives</p> <ul style="list-style-type: none"> Describe the differences in life cycles of mammals, amphibians, insects and birds. Describe reproduction in plants and animals. <p>Y6 objectives</p> <ul style="list-style-type: none"> Describe how living things are classified according to common characteristic including micro-organisms, plants and animals. Give reasons for classifying plants and animals based upon characteristic. <p>Guidance</p> <ul style="list-style-type: none"> Observe life cycle in 	<p>(Biology) Animals including humans:</p> <p>Y5 objectives</p> <ul style="list-style-type: none"> Describe the changes as humans develop to old age. <p>Y6 objectives</p> <ul style="list-style-type: none"> Identify human circulatory system and describe functions of the heart, blood vessels and blood. Recognise impact of diet, exercise, drugs and lifestyle. Describe how nutrients and water are transported in animals and humans. <p>Guidance</p> <ul style="list-style-type: none"> Draw a timeline to indicate growth and development of humans Changes in puberty Compare gestation periods

	<ul style="list-style-type: none"> • Compare how some living things have adapted to survive: cacti, penguins, camels. • Analyse advantages and disadvantages of adaptations e.g. 2 or 4 feet, long or short beak, gills or lungs. <p>Key Scientists</p> <ul style="list-style-type: none"> • Mary Anning (Palaeontologists) • Charles Darwin (Naturalist) • Gregor Mendel (Botanist and Biologist) • Alfred Wallace 	<p>water and coloured filters.</p> <p>Key Scientists</p> <ul style="list-style-type: none"> • Thomas Edison (inventor) • Edith Clarke (electrical engineer) 	<ul style="list-style-type: none"> • Series circuits only. • Design and make a set of traffic lights or burglar alarm <p>Key Scientists</p> <ul style="list-style-type: none"> • Michael Faraday (Physicist) • William Kamkwamba (inventor) 		<p>vegetable garden, animals.</p> <ul style="list-style-type: none"> • Find out about the work of the key scientists listed. • Sexual and asexual reproduction in plants and sexual reproduction in animals. • Compare life cycles in local area to animals in rainforests, oceans, deserts etc. • Grow new plants from parent plant using seeds, stems, root cuttings, bulbs and observe. • Compare how different animals reproduce and grow. • Broad groupings can be subdivided. • Decide where unfamiliar animals would 	<p>of animals with humans</p> <ul style="list-style-type: none"> • Find out and record length and mass or a baby as it grows. • Use learning in Y3/4 on skeletal, muscular and digestive systems to answer questions that help to understand circulatory system. • How to keep bodies healthy and what can be harmful to humans <p>Key Scientists</p> <ul style="list-style-type: none"> • Elizabeth Blackwell (Doctor) • Marie Curie (Physicist and Chemist) • Alexander Fleming (Physicist and Microbiologist)
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					<p>belong on a classification system.</p> <p>Key Scientists</p> <ul style="list-style-type: none">• May Agnes Chase• David Attenborough• Carl Linnaeus• Jane Goodall	
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