





Queensgate Foundation Primary School












Science Long Term Plan

Year 1

Topic	Knowledge Covered	Overview
<p><u>Everyday Material</u></p>	<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 properties 	<p>Children will explore, name and discuss questions about everyday materials. They will learn the properties such as hard/soft stretchy/stiff shiny/dull rough/smooth waterproof/ not waterproof absorbent/ not absorbent opaque/transparent.</p> 
<p><u>Animals including Humans</u></p>	<ul style="list-style-type: none"> - 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 - Describe and compare common animals - Identify name draw and label basic parts of the human body and say which is associated with each sense 	<p>Children will use the local environment throughout the year to explore animal habitats. They will also learn the names of the main body parts including head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth and teeth. They will also relate this to the 5 senses through games, songs and rhymes.</p> 

<p><u>Seasonal Changes</u></p>	<ul style="list-style-type: none"> - Observe changes across the 4 seasons - Observe and describe weather - How the length of seasons vary 	<p>Children will observe and discuss changes in the weather across seasons.</p> 
<p><u>Plants</u></p>	<ul style="list-style-type: none"> - Identify and name a variety of garden plants including deciduous and evergreen trees - Identify and describe the basic structure of a variety of common flower and plants including trees 	<p>Children will use the local environment throughout the year to explore and answer questions about plants growing in their habitats. Observe growth of flowers and vegetables that they have planted to know simple structures of a plant.</p> 

Year 2

Topic	Knowledge Covered	Overview
<p>Uses of Everyday Material</p>	<ul style="list-style-type: none"> - Identify and compare a variety of everyday materials including wood, metal, plastic, glass, brick, rock, paper and cardboard - Find out how the shapes of how the shapes of solid objects can be changed by squashing, bending, twisting and stretching - 	<p>Children will become familiar with how some materials are used for more than one thing. They will discuss how some materials are more suitable for particular purposes.</p> <div style="display: flex; flex-wrap: wrap; justify-content: space-around;"> <div style="text-align: center;"> Bricks</div> <div style="text-align: center;"> Cement</div> <div style="text-align: center;"> Concrete</div> <div style="text-align: center;"> Sand</div> <div style="text-align: center;"> Reinforcement</div> <div style="text-align: center;"> Glass</div> <div style="text-align: center;"> Plastic</div> <div style="text-align: center;"> Wood</div> <div style="text-align: center;"> Tiles</div> </div>
<p>Living things and their habitats</p>	<ul style="list-style-type: none"> - Compare differences between living and non living things that have never been alive - Identify that most living things live in habitats to which they are suited and describe how these habitats provide for them. - Describe how animals and plants depend on each other - Identify and name a variety of plants and habitats including microhabitats - Describe how animals obtain their food using the idea of a simple food chain - Identify and name sources of food 	<p>Children will work scientifically by sorting and classifying animals and plants into living, dead or never alive. They will learn how to construct a simple food chain. They will have the opportunity to raise and answer questions about their local environment that help them to study a variety of plants and animals within their habitats.</p> 
<p>Animals including Humans</p>	<ul style="list-style-type: none"> - Basic needs of animals for survival - Importance of exercise and nutrition - The processes of growth and reproduction in animals 	<p>Children will learn examples of reproduction such as egg/chick/chicken; caterpilla/pupa/butterfly ect. They will learn about growing from a baby to a teenager and adult. Children will ask questions about what things animals and humans need for survival and what is needed to stay healthy.</p> 


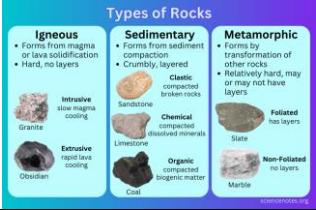
Plants

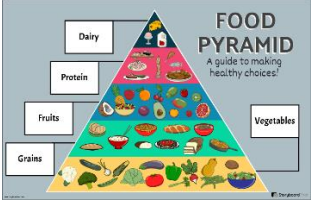


- Observe and describe how seeds and bulbs grow
- Find out and describe how plants need water, light and a suitable temperature to grow and be healthy

Children will use the local environment throughout the year to observe how different plants grow. They will learn the requirements for plants growth and survival as well as the process of reproduction in plants. Pupils will work scientifically by observing and recording with accuracy the growth of a variety of plants. They will do a comparative test to show that plants need light and water to stay healthy.






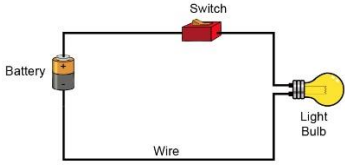

Year 3

Topic	Knowledge Covered	Overview
<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 the ways to protect their eyes. 	<p>Children will explore what happens when light reflects off of a mirror or other reflective surfaces. They will learn about the importance of protecting their eyes from bright light. They will look for and measure shadows as well as finding out how they are formed and can change. They will work scientifically looking for patterns in what happens to shadows when the light source moves or the distance changes.</p> 
<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 - Recognise that soil are made from rock and organic matter - 	<p>Linked with geography work children will explore rocks and soils in the local environment. Pupils will work scientifically by observing rocks including those used in buildings, gravestones and explore how they might change over time. They will use microscopes to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them. They will research different types of living things who may be in sedimentary rock. Children will explore soils and identify similarities and differences and investigate what happens when rocks are in water or rubbed together (permeable/ non permeable)</p> 


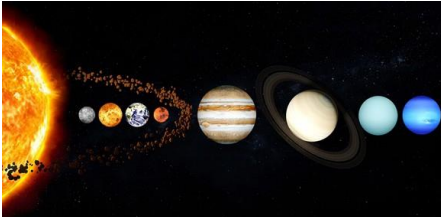
<p>Animals including Humans</p>	<ul style="list-style-type: none"> - Identify that animals including humans need the right nutrition and that they cannot make their own food - Nutrition comes from what they eat - Identify that humans and some animals have skeletons and muscles for support, protection and movement 	<p>Children will continue to learn about the importance of nutrition and will be introduced to the main body parts associated with the skeleton and muscles, They will find out how parts of the body have special functions. Pupils will work scientifically by identifying and grouping animals with and without skeletons and observing and comparing movement. They will research different food groups and how they keep us healthy then design meals.</p> 
<p>Plants</p>	<ul style="list-style-type: none"> - Identify and describe the functions of the different parts of the flower including roots, stem, trunk, leaves and flowers - Explore the requirements of plants for life and growth (air, light, water, nutrients from soil and room) - Investigate the transportation of water in plants - Explore the part that flowers play in the life cycle of flowering plants including pollination, seed formation and seed dispersal. 	<p>Children will be introduced to relationship between the structure and function – the idea that every part of a plant has a job to do. They will explore questions that focus on the role of roots and stem in nutrition and support, leaves for nutrition and flowers for reproduction. They will discover that plants make their own food and how. They will work scientifically by comparing the effect of different factors on plant growth eg light, fertilizer and formation of seeds.</p> 
<p>Forces including Magnets</p>	<ul style="list-style-type: none"> - Compare how things move on different surfaces - Notice that some forces need contact between two objects - Magnetic forces can act at a distance - Observe how magnets attract or repel each other and other materials - Compare and group a variety of everyday materials and identify some magnetic materials - Describe magnets as having two poles - Predict if two magnets will attract or repel 	<p>Children will observe ,magnetic forces and how they act in comparison to other forces, They will explore the behaviour of everyday uses od everyday magnets. They will work scientifically to compare and group how things move. They will carry out experiments to find out how far things move and the strengths of different magnets. They will find a fair way to compare them. They will identify how magnetic properties are useful in everyday items and suggest creative uses for them.</p> 



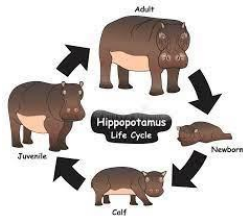
Year 4

Topic	Knowledge Covered	Overview
<p><u>Animals including Humans</u></p>	<ul style="list-style-type: none"> - Describe the main functions and basic parts of the digestive system - Identify the different types of teeth in humans and simple functions - Construct and interpret a variety of food chains - Identify predators, producers and prey - 	<p>Children will be introduced to the main parts of the digestive system eg mouth, tongue, teeth, oesophagus, stomach and intestine. They will learn to understand their functions and label a diagram. Pupils will work scientifically by comparing the teeth of carnivores and herbivores they will be given the opportunity to suggest reasons for differences. They will find out what damages teeth and how to look after them. They will complete an experiment using eggs to investigate the effect of different liquids on tooth decay.</p> 
<p><u>Sound</u></p>	<ul style="list-style-type: none"> - Identify how sounds are made associating some of them with something vibrating - Recognise that vibrations of sounds travel through a medium to the ear - Find patterns between pitch and features of the object producing it - Find patterns between the volume of a sound and the strength of the vibrations that produced it - Recognise sounds get fainter as the distance from the source increases 	<p>Children will explore and identify the way sounds are made through vibration in a range of different musical instruments. They will investigate how the pitch and volume can be changed in a variety of ways. They will work scientifically to identify patterns in sounds that are made by different objects.</p> 
<p><u>States of Matter</u></p>	<ul style="list-style-type: none"> - Compare and group materials together according to whether they are solid, liquid and gasses. - Observe that some materials change state when they are heated or cooled. Research and measure the temperature at which this happens. - Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature - 	<p>Children will continue to explore everyday materials and will develop simple descriptions about the states of matter eg solids hold their shape, liquids form a pool and gasses escape. Pupils will observe water as a solid liquid and gas. Pupils will work scientifically by grouping and classifying different materials into their state. They will explore the effect of temperature on substances through baking in cookery.</p> 

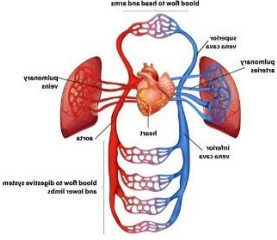
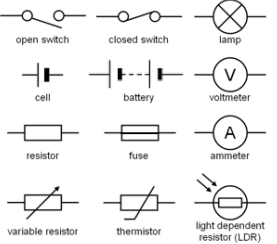
<p>Electricity</p>	<ul style="list-style-type: none"> - Identify common appliances that run on electricity - Construct a simple series circuit, identify and name basic parts - Identify whether or not a lamp will light in a simple circuit based on if it is a complete loop - Recognise that a switch will open and close a circuit and relate to a lamp lighting - Recognise common conductors and insulators and associate metals with being good conductors 	<p>Children will experiment with making simple series circuits with various different components. They will use their circuits to make simple creative devices linked to Design and Technology. Pupils will also learn to draw a circuit using conventional symbols.</p> 
<p>Living things and their Habitats</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 <p>Recognise that environments can change and this can pose dangers to living things</p>	<p>Pupils will identify how habitats change throughout the year and how this can affect living things. Pupils will explore ways of grouping a wide selection of living things that include animals, flowering plants and non-flowering plants. They will put vertebrate animals into groups fish, mammals, amphibians, reptiles and birds. They will explore examples of positive and negative human impact on the environment. Children will work scientifically to make simple guides or keys to identify local plants and animals.</p> <p style="text-align: center;">TYPES OF HABITATS</p> 

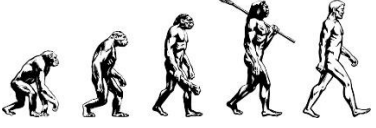
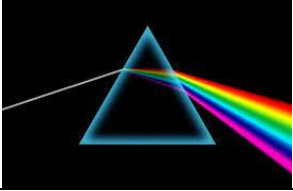
Year 5

Topic	Knowledge Covered	Overview
<p><u>Animals including Humans</u></p>	<ul style="list-style-type: none"> - Describe the changes as humans develop to old age 	<p>Pupils will draw a timeline to indicate the stages in development in humans. They will learn about the changes experienced in puberty related PSHE. They will work scientifically to research the gestation periods of other animals and compare with humans.</p> 
<p><u>Earth and Space</u></p>	<ul style="list-style-type: none"> - Describe the movement of the Earth and other planets relevant to the sun in the solar system - 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 movement of the sun across the sky. 	<p>Children will be introduced to a model of the Sun and Earth so they can see day and night. They will learn the sun is at the centre of our solar system with 8 planets orbiting. They will learn that the moon is a celestial body that orbits a planet. Pupils will find out about how the idea of the solar system has developed over time through research. They will work scientifically comparing the time of day at different places on the Earth.</p> 

<p><u>Properties and Changes of materials</u></p>	<ul style="list-style-type: none"> - Compare and group together everyday materials on the basis of their properties including hardness, solubility, transparency, conductivity, response to magnets - Know that some materials dissolve to a liquid to form a solution and describe how to recover a substance from a solution - Use knowledge of solids, liquids and gasses to decide how mixtures might be separated - Give reasons based on evidence from fair tests for the particular uses of everyday materials - Demonstrate that dissolving, mixing and changes of state are reversible - Explain that some changes result in new materials and that this is not usually reversible including changes associated with burning and acid on bicarbonate of soda 	<p>Pupils will build a systematic understanding of materials by exploring and comparing the properties of a broad range of materials including relating these to magnetism. Pupils will explore changes that are difficult to reverse such as burning, rusting, burning etc. They will research how chemists create new materials. Pupils will work scientifically by carrying out tests to answer questions such as what materials are the most effective for making a warm jacket, for stopping ice cream melting and making blackout curtains. The children will research and discuss how chemical changes have impacted our lives.</p> 
<p><u>Forces</u></p>	<ul style="list-style-type: none"> - Explain that unsupported objects fall towards the earth because of gravity acting between the earth and the falling object - Identify the effects of air resistance, water resistance and friction, that act between moving forces - Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect - 	<p>Children will work scientifically to explore falling objects and raise questions about the effects of Air Resistance by observing how different objects such as parachutes and sycamore seeds fall. They will experience how forces make things begin to move, get faster or slow down. They will explore the effects of friction on movement and find out how it slows or stops moving objects. They will research how scientists such as Galileo and Issac Newton helped to develop the theory of gravity. They will explore resistance in water by making boats in water. They may also design and make artefacts that use simple levers and pulleys and springs and explore the effects.</p> 
<p><u>All Living things and their Habitats</u></p>	<ul style="list-style-type: none"> - Describe the differences between the life cycle of a mammal, an amphibian, an insect and a bird - Describe the life process of reproduction of some plants and animals - 	<p>Pupils will raise questions about their local environment throughout the year. They should observe a life cycle changes in a variety of different things eg plants. They will find out about naturalists and animal behaviourists. Children will find out about sexual and asexual reproduction in plants. They will work scientifically to observe and compare how animals change over a period of time.</p> 

Year 6

Topic	Knowledge Covered	Overview
<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 and drugs on the body - Describe the ways in which nutrients and water are transported within animals, including humans - 	<p>Pupils will explore and answer questions that help them to understand how the circulatory system enables the body to function. They will learn how to keep their bodies healthy building on prior knowledge. They will move on to learn drugs and substances can be harmful to the human body linked to PSHE. They will work scientifically exploring the work of scientists about the relationship between diet, exercise, drugs and lifestyle and health.</p>  <p>The diagram illustrates the human circulatory system. It shows the heart in the center, with four main chambers: the right and left atria and ventricles. Red lines represent oxygenated blood, and blue lines represent deoxygenated blood. Labels include: 'vena cavae (inferior and superior)', 'pulmonary artery', 'pulmonary veins', 'aorta', 'heart', 'arteries', 'veins', 'capillaries', 'venous sinuses', and 'arterial sinuses'. The diagram shows blood flowing from the heart to the lungs and then to the rest of the body, and returning from the body to the lungs and back to the heart.</p>
<p>Electricity</p>	<ul style="list-style-type: none"> - Associate the brightness of a lamp with the number and voltage of cells in a circuit - Compare and give reasons for variations in how components function including bulb brightness, buzzer loudness and on/off switch - Use recognised symbols to represent a simple circuit in a diagram 	<p>Children will build on prior knowledge to construct series circuits and test out different components. They will use diagrams to represent circuits using recognised symbols. Pupils work scientifically by systematically identifying the effect of changing a component in a circuit. They will use their circuit to make a useful product eg burglar alarm or traffic lights</p>  <p>The diagram shows standard circuit symbols for various components: <ul style="list-style-type: none"> open switch: a break in the wire with two small circles at the ends. closed switch: a break in the wire with a diagonal line connecting the two ends. lamp: a circle with a cross inside. cell: a long vertical line next to a shorter, thicker vertical line. battery: a series of four cells connected together. voltmeter: a circle with a 'V' inside. resistor: a rectangle. fuse: a rectangle with a diagonal line through it. ammeter: a circle with an 'A' inside. variable resistor: a rectangle with a diagonal arrow pointing through it. thermistor: a rectangle with a diagonal line through it and a small circle at the end. light dependent resistor (LDR): a rectangle with a diagonal line through it and a circle at the end with two arrows pointing towards it. </p>

<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. That 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 	<p>Pupils will be introduced to the idea that characteristics are passed from parents to offspring. They will do this by considering breeds of dogs and considering what happens when breeds are crossed. Children will appreciate the variation in offspring over time can make animals more or less able to survive in particular environments. Pupils will research the work of paleontologists. They will work scientifically by raising questions about local animals and how they have adapted to their environment. They will also compare how some living things are adapted to survive in extreme conditions eg cats and penguins.</p> 
<p>Light</p>	<ul style="list-style-type: none"> - Recognise that light appears to travel in straight lines - Use the idea of light travelling 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 to objects and then to our eyes - Use the idea that light travels in straight lines to explain shadows 	<p>Children will build on prior knowledge to explore the way light behaves including light sources, reflection and shadow. They will make predictions and experiment before discussing their results. They will work scientifically by designing and making a periscope and explain how it works. They will explore phenomena such as rainbows, colours on soap bubbles, objects looking bent in water and coloured filters.</p> 
<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 based on similarities and differences including microorganisms, plants and animals - Give reasons for classifying plants and animals based on characteristics 	<p>Pupils will work scientifically by using classification systems and keys to identify animals and plants in their immediate environment. They will research unfamiliar animals and plants from a broad range of other habitats and decide where they belong in a classification system. They will be introduced to the idea that broad groupings such as microorganisms plants and animals can be subdivided through direct observations. They will classify animals into invertebrates and vertebrates.</p> 