St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

## Purpose

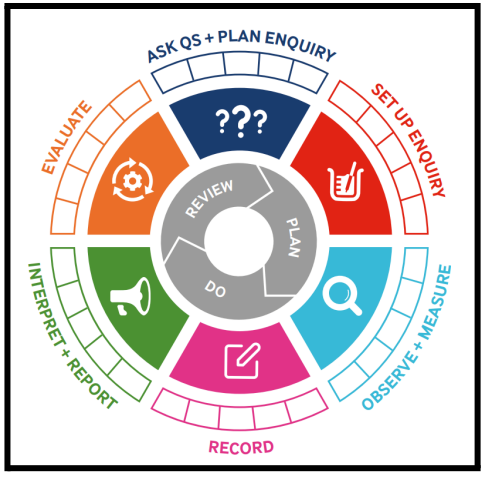
A high-quality science education provides the foundations for understanding the world through the specific disciplines of Biology, Chemistry and Physics. Science has changed our lives and it is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

The National Curriculum for Science aims to ensure that all pupils:

- Develop **scientific knowledge and conceptual understanding** through specific disciplines of biology, chemistry and physics.
- Develop understanding of **nature, processes and methods of science** through different types of scientific enquiries that help them to answer scientific questions about the world around them.
- Are equipped with the scientific knowledge required to understand the **uses and implications** of science, today and in the future.

## Working Scientifically

In addition to the substantive scientific knowledge, children will experience a curriculum rich in opportunities to hone their skills as a scientist. 'Working Scientifically' specifies the understanding of the nature, processes and methods of science for each year group. The disciplinary knowledge is taught within each strand of Biology, Chemistry and Physics, focusing on the key features of scientific enquiry so that pupils learn how to use a variety of approaches to answer relevant questions. The 'Working Scientifically' skills, laid out in the National Curriculum, reflect the cyclical nature of scientific research: asking questions, planning and investigation, making observations, recording results, drawing conclusions and evaluating the efficacy of the



investigation at advancing knowledge, including asking further questions and planning further relevant enquiries. Science lessons should be practical and interactive, teaching knowledge through using and applying the skills of scientific enquiry, enabling children to ask questions with confidence and accuracy. The National Curriculum states that types of enquiry that should be covered include:

| Observing Over Time | Pattern Seeking | Identifying, Classifying and Grouping | Comparative and Fair Testing | Research Using Secondary Sources |
|---|---|---|---|---|
|  |  |  |  |  |

It is expected that the skills in 'Working Scientifically' are woven through each unit of learning and that substantive knowledge is not gained solely through practical approaches to answering questions. Research using secondary sources, which include lessons, teacher models and diagrams, is therefore given weight as a type of enquiry due to being essential in gaining scientific knowledge required for every child to have a deep understanding of each of the 'big ideas' at the end of KS2. Along with ensuring that the majority of science lessons will enable children to undertake scientific enquiry in some form, children will be explicitly taught how to approach these in the cyclical nature of science. These Working Scientifically Skills are crucial for scientific understanding and thinking, with the expectation for children to be explicitly taught these and relate them to their experiences.

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

Threshold concepts:

| Biology | Chemistry | Physics |
|---|---|---|
| Plants<br>Animals, including humans<br>Living things and their habitats<br>Evolution and inheritance | Materials, including rocks and soils | Movement, forces and magnets<br>Light<br>Sound<br>Electricity<br>Earth in space, including the seasons |

Working Scientifically Skills Taught Explicitly

| Asking Questions | Making Predictions | Setting Up Tests | Observing and Measuring | Recording Data | Interpreting and Communicating Results | Evaluating |
|---|---|---|---|---|---|---|
| Asking questions that can be answered using a scientific enquiry. | Using prior knowledge to suggest what will happen in an enquiry. | Deciding on the method and equipment to use to carry out an enquiry. | Using senses and measuring equipment to make observations about the enquiry. | Using tables, drawings and other means to note observations and measurements. | Using information from the data to say what you found out. | Reflecting on the success of the enquiry approach and identifying further questions for enquiry. |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | |
|---|---|
| **How learning starts in the early years:** | The first steps learning Science is built on developing an enquiring mind, promoting children's intellectual development, equipping children for the ever growing scientific and technological world. This includes the development of thinning logically, problem solving and learning that Science can be fun!<br><br>The Early Years Foundation Stage Curriculum's Characteristics of Effective Learning, provide the foundations for Working Scientifically:<br>• Asking Questions: Guide their own thinking and actions by referring to visual aids or by talking to themselves while playing. Use pretend play to think beyond the "here and now". Know more, so feel confident about coming up with their own ideas. Make more links between those ideas.<br>• Plan: plan and think ahead about how they will explore or play with objects. Show goal-directed behaviour. Concentrate on achieving something that's important to them.<br>• Make Observations: Realise that their actions have an effect on the world, so they want to keep repeating them. Respond to new experiences that you bring to their attention.<br>• Gather, Record and Classify Data: Sort Materials.<br>• Answer Questions and Make Conclusions/Predictions: Solve real problems.<br>• Evaluate: Begin to correct their mistakes themselves. Review their progress as they try to achieve a goal. Check how well they are doing.<br><br>In the Early Years, Science is very exploratory, immersive and language rich. Children are encouraged to observe change in the environment, seasons, materials and weather. Planned experiments are provided with a rich vocabulary in order to discuss scientific threshold concepts. Along with the learning environment being enhanced with scientific equipment, books and visual aids are provided to develop understanding of natural changes in the world. Within the provision, toys and resources linked to threshold concepts in science support the observation skills. e.g Light box, circuits, magnifying glasses, rocks, shells, fossils, magnets and loose parts. Pupils will have visited parks and looked at the natural world around the school. They will listen to a broad selection of stories which will have provided a foundation to their learning in this area. |

| | |
|---|---|
| | Children will have some understanding of different seasons.<br>They will learn about the **life cycles** of chickens, frogs and butterflies with eggs, spawn and caterpillars being bought into school. They are encouraged to observe the daily changes, comment on what they see and develop their questioning skills to find out more.<br>Children will learn about **planting** and the conditions needed for plants to grow. They will have opportunities to grow vegetables in our raised bed, plant sunflowers and beans, watching and commenting on the progress and stages in growth.<br>Children will learn about **substances and properties** when cooking and within the malleable area. They will make dough and explore the properties of malleable materials such as corn flour, sand, clay. Children will have made observations and drawn pictures of plants.<br>**Earth in space** as a theme is explored through the use of books, stories, and media clips.<br>Forest School plans for exploration of the natural world, looking for similarities and differences, **habitats,** and spotting **changes** in the seasons. Children are asked to explain findings, and explain why things occur and how changes happen.<br><br>The Early Learning Goals directly link to Science along with this.<br>• People, Culture and Communities: Describe their immediate environment using knowledge from observation, discussion, stories and non-fiction texts and maps.<br>• The Natural World: Explore the natural world around them, making observations and drawing pictures of plants and animals. Understand some processes and changes in the natural world around them, including the seasons and changing states of matter. Pupils should understand that we use materials to make things in the context of familiar stories, for example 'The Three Little Pigs.' 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. |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | Key Stage One | | Key Stage Two | | | |
|---|---|---|---|---|---|---|
| | Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | Year 6 |
| Breath Of Study (NC Ref): | **Context: Animals, Including Humans - Biology**<br>*Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals.*<br>*Identify and name a variety of common animals that are carnivores, herbivores and omnivores.*<br><br>**Context: Plants - Biology**<br>*Identify and name a variety of common wild and garden plants,* | **Context: Animals, Including Humans - Biology**<br>*Notice that animals, including humans, have offspring which grow into adults.*<br>*Find out about and describe the basic need of animals, including humans, for survival (water, food and air).*<br>*Describe the importance for humans of exercise, eating the right amounts of different types of* | **Context: Animals, Including Humans - Biology**<br>*Identify what 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.*<br>*Identify that humans and some other animals have skeletons and muscles for support, protection and movement.* | **Context: Animals, Including Humans - Biology**<br>*Describe the simple functions of the basic parts of the digestive system in humans.*<br>*Identify the different types of teeth in humans and their simple functions.*<br>*Construct and interpret a variety of food chains, identifying producers, predators and prey.* | **Context: Animals, Including Humans - Biology**<br>*Describe the changes as humans develop to old age.*<br><br>**Context: Living Things and Their Habitats - Biology**<br>*Describe the difference in the life cycles of a mammal, an amphibian, an insect and a bird.*<br>*Describe the life process of reproduction in some plants and animals.*<br><br>**Context: Properties and Changes of Materials - Chemistry** | **Context: Animals, Including Humans - Biology**<br>*Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood.*<br>*Recognise the impact of diet, exercise drugs and lifestyle on the way their bodies function.*<br>*Describe the ways in which nutrients and water are transported within animals, including humans.* |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | including deciduous and evergreen trees.<br>Identify and describe the basic structure of a variety of common flowering plants, including trees.<br><br>**Context: Seasonal Changes - Biology**<br>Observe changes across the four seasons.<br>Observe and describe weather associated with the seasons and how day length varies.<br><br>**Context: Everyday Materials - Chemistry**<br>Distinguish between an object and the material | food, and hygiene.<br><br>**Context: Plants - Biology**<br>Observe and describe how seeds and bulbs grow into mature plants.<br>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.<br><br>**Context: Living Things and Their Habitat - Biology**<br>Explore and compare the differences between things that are | **Context: Plants - Biology**<br>Identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers.<br>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.<br>Investigate the way in which water is transported within plants. | **Context: Living Things and Their Habitats - Biology**<br>Recognise that living things can be grouped in a variety of ways.<br>Explore and use classification keys to help group, identify and name a variety of living things in their local and wider community.<br>Recognise that environments can change and that this can sometimes pose dangers to living things.<br><br>**Context: States of** | Compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets.<br>Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution.<br>Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including | **Context: Living Things and Their Habitats - Biology**<br>Describe 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.<br>Give reasons for classifying plant and animals based on specific characteristics.<br><br>**Context: Evolution and Inheritance - Biology** |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | from which it is made.<br>Identify and name a variety of everyday materials, including wood, plastic, grass, metal, water and rock.<br>Describe the simple physical properties of a variety of everyday materials.<br>Compare and group together a variety of everyday materials on the basis of their simple physical properties. | living, dead and things that have never been alive.<br>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.<br>Identify and name a variety of plants and animals in their habitats, including micro habitats. | Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.<br><br>**Context: Rocks - Chemistry**<br>Compare and group together different kinds of rocks in the basis of their appearance ad simple physical properties,<br>Describe in simple terms how fossils are formed when things that have | **Matter - Chemistry**<br>Compare and group materials together, according to whether they are solids, liquids or gases.<br>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).<br>Identify the part played by evaporation and condensation in the water cycle and | metals, wood and plastic.<br>Demonstrate that dissolving, mixing and changes of state are reversible changes.<br>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.<br><br>**Context: Earth and Space - Physics**<br>Describe the movement of the Earth, and other planets, relative to | Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.<br>Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents.<br>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution. |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | | 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.<br><br>**Context: Everyday Materials - Chemistry**<br>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and | lived are trapped within rock.<br>Recognise that solids are made from rocks and organic matter.<br><br>**Context: Light - Physics**<br>Recognise that they need light in order to see things and that dark is the absence of light.<br>Notice that light is reflected from surfaces.<br>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. | associate the rate of evaporation with temperature.<br><br>**Context: Sound - Physics**<br>Identify how sounds are made, associating some of them with something vibrating.<br>Recognise that vibrations from sounds travel through a medium to the ear.<br>Find patterns between the pitch of a sound and features of the object that produced it. | the Sun in the solar system.<br>Describe the movement of the Moon relative to the Earth.<br>Describe the Sun, Earth and Moon as approximately spherical bodies.<br>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky.<br><br>**Context: Forces - Physics**<br>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the | **Context: Light - Physics**<br>Recognise that light appears to travel in straight lines.<br>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.<br>Explain that we see things because light travels from light sources to our eyes from light sources to objects and then to our eyes.<br>Use the idea that ight travels in straight lines to explain why |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | | cardboard for particular uses.<br>Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. | Recognise that shadows are formed when the light from a light source is blocked by an opaque object.<br>Find patterns in the way that the size of shadows change.<br><br>**Context: Forces and Magnets - Physics**<br>Compare how things move on different surfaces.<br>Notice that some forces need contact between two objects, but magnetic forces can act at a distance.<br>Observe how magnets attract or | Recognise that sounds get fainter as the distance from the sound source increases.<br><br>**Context: Electricity - Physics**<br>Identify common appliances that run on electricity.<br>Construct a simple electrical circuit, identifying and naming basic parts, including cells, wires, bulbs, switches and buzzers.<br>Identify whether or not a lamp will light in a simple series circuit and | Earth and the falling object.<br>Identify the effects of air resistance and friction that act between moving surfaces.<br>Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. | shadows have the same shape as the objects that cast them.<br><br>**Context: Electricity - Physics**<br>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit.<br>Compare and give reasons for variations in how components function, including the brightness and bulbs, the loudness of buzzers and the on/off position of switches.<br>Use recognised |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | repel each other and attract some materials and not others.<br>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.<br>Describe magnets as having two polars.<br>Predict whether two magnets will attract or repel each other, depending on which poles are facing. | associate this with whether or not the lamp is part of a complete loop with a battery.<br>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.<br>Recognise some common conductors and insulators, and associate metals with being good conductors. | | symbols when representing a simple circuit in a diagram. |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| Knowledge and Understanding  | Threshold Concept: Biology | | | | | |
|---|---|---|---|---|---|---|
| | **Context: Animals, including Humans.** Different parts of the human body. Each job each part of the body has a function. Humans have five senses, each with an associated body part - touch (skin), sight (eyes), smell (nose), hearing (ears) and taste (tongue). Birds - all lay eggs; have beaks, feathers, two legs and two wings. Most can fly but not all. They have lungs, breathe air, and are warm blooded. Fish - all | **Context: Animals, Including Humans.** All animals, including humans, have offspring, they get older and bigger, and most will go on to have offspring of their own. All animals are at a stage in their lifecycle. Animals, including humans, change a lot as they move through the cycle. Humans begin as babies and grow into adults; we go through different stages of growth. | **Context: Animals, Including Humans** Animals, including humans, cannot produce their own food. Animals get the energy they need to survive from a balanced and varied diet with specific types and amounts of nutrients. Humans need a balanced diet of fruit and vegetables, carbohydrates, protein, dairy and fat to stay healthy. To keep pets healthy, provide | **Context: Animals, Including Humans** Humans have three types of teeth. Molars: the teeth at the back of the mouth, used for cutting food. Incisors: the teeth at the very front of the mouth, used for cutting food. Canines: the teeth at the sides of the mouth between the incisors and molars, used for tearing up food. Different animals have different teeth based on their diet. | **Context: Living Things and Their Habitats** A lifecycle is the different stages of life for all living things. There are normally four major events in the lifecycle of animals: birch, growth, reproduction, death. There are some significant differences in the specific development processes for the lifecycle of mammals, amphibians, insects and birds. | **Context: Living Things and Their Habitats** The classification of animals involves organising them into groups based on shared characteristics - taxonomy. This helps scientists study and understand the enormous variety of living organisms. Animals can be sorted in a variety of ways e.g. vertebrates, invertebrates, warm-blooded, cold-blooded or into groups such as annelids, molluscs, |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | live in water and have scales; have gills that allow them to breathe underwater and are cold blooded. Do not have legs. Most lay eggs.<br>Mammals - have fur; lungs to breathe air; are warm blooded; give birth to their young. Not all live on land.<br>Amphibians - can live on land and water; most have slimy skin; lay eggs; are cold blooded. Reptiles - have dry, scaly skin; breathe air; are cold blooded; | Human body parts change with age. As people grow older, their body goes through various changes.<br>Animals, including humans, all need water, air, shelter and food to survive. Humans should exercise to keep us fit and healthy and help our body to function. Exercise is a way of moving our bodies to eat a balanced diet to stay healthy, and helps us feel good.<br>Animals, including | balanced nutrition, regular exercise, routine veterinary care, proper hygiene, and a loving environment.<br>Animals, including humans need a skeleton for support, protection of organs, and to enable movement.<br>It is important to eat a healthy diet with enough calcium to help your bones grow. We find calcium in dairy products like milk and cheese.<br>Muscles often work in pairs, pulling | Herbivores: need flat molars and flat incisors.<br>Carnivores: need canines and incisors. Humans and Omnivores: need all three types of teeth.<br>Digestion happens in the digestive system. Made up of different organs that break down the food so it can be absorbed into our blood to give our body the nutrients and energy it needs to function.<br>All living things need energy from | A naturalist is an individual who has a keen interest and expertise in the study of the natural world. They observe, document and study plants, animals, fungi, rocks, and other elements of the environment.<br>Asexual reproduction allows for plants to reproduce without seeds and produce offspring that are genetically identical to the parent plant.<br>Sexual reproduction in plants is where pollen (from the male part) and ovule (from | arachnids.<br>Classification enables scientists to identify relationships among species, predict traits, and communicate biological information effectively. It is a crucial tool in simplifying the study of animals and contributing to our overall understanding of the natural world.<br>Plants can be classified based on shared characteristics: plant taxonomy. This process helps scientists organise plants into systematic |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | lay eggs; can live on land and water. Carnivores eat other animals. Herbivores eat plants. Omnivores eat both plants and animals.<br><br>**Context: Plants**<br>Know and name a variety of common wild and garden plants, including evergreen and deciduous trees. Roots are the part of the plant which is usually under the ground. Roots hold the plant up and take in water from the soil. Flowers, petals, roots, stem and leaves are all parts | humans, need to eat a balanced diet to stay healthy. This includes eating the right amount of fruit, vegetables, cereal, meat, dairy, fat and sugar.<br><br>**Context: Living Things and Their Habitats**<br>Living things can move, feed, grow, reproduce and use their senses. Dead things were once alive (were once part of a living things or a living thing that has died) but no longer | on your bones so that you can move. Your skeleton has joints which allow movement. When a muscle contracts it gets shorter and then relaxes to return to its normal length. It is important to eat a healthy diet with enough protein to help your muscles grow properly. We find protein in meat, fish, eggs and beans. People who engage in more physical activity often develop stronger muscles | food to grow, repair and reproduce. Animals need to eat plants/other animals to get their energy. The flow of energy from one living thing to another is shown in the arrows in a food chain.<br><br>**Context: Living Things and Their Habitats**<br>Classification is putting things into groups. Living things can be divided into these groups of 'classified' by looking at | the female part) come together to make seeds, and these seeds grow into new plants. Reproduction means to have babies and offspring. Animals need both male and female to reproduce to mate. This is sexual reproduction. Internal reproduction involves the fertilisation of eggs inside the body of the female. External reproduction involves the release of eggs and sperm into the external | and meaningful groups. Plants can be classified in a range of ways: seeds, no seeds, flowers, no flowers, leaf size, shape. Different plant groups have specific adaptations that suit particular environmental conditions. Microorganisms, including bacterial, viruses, fungi, and protists, play a crucial role in various aspects of life on Earth.<br><br>**Context: Evolution and Inheritance**<br>Evolution explains |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | of flowering plants. Trunks, branches, bark, blossom and fruit are parts of a tree. Trees are plants. Deciduous trees change and drop their leaves with the seasons. Evergreen trees stay green and keep their leaves all year round.<br><br>**Context: Seasonal Changes**<br>In the UK, there are four seasons: spring, summer, autumn and winter. The weather is often different in each season. In summer the day is longer than the night. In Winter | shows signs of life. Things that have never been alive are objects or materials that were never part of a living thing. A habitat is a place where an animal or plant lives. It is an environment that has everything the animals and plants in it need to live. A microhabitat is a very small habitat that also has everything animals and plants in it, need to live. There are a range of different habitats | because exercise promotes muscle growth and strength.<br><br>**Context: Plants**<br>Plants spread their seeds in lots of different ways. This is called seed dispersal. Some seeds are transported by the wind and are shaped to float, glide or spin through the air. This is important to prevent seeds from needing to compete for space, light, water and nutrients. Roots: | similarities and differences between the way they look and behave.<br>Animals are divided into two main groups. Animals that have a backbone(spine) are called vertebrates. Animals that do not have a backbone are called invertebrates.<br>A classification key is a tool used by scientists and naturalists to help identify and categorise living things.<br>An environment | environment, where fertilisation takes place.<br><br>**Context: Animals, Including Humans.**<br>Know that the human lifecycle has many stages: embryo, foetus, baby, toddler, child, adolescent, adult, older adult.<br>Puberty is a natural process during which an individual undergoes physical and hormonal changes, marking the transition from childhood and adulthood. Changes including the | how the living things on our planet today have slowly developed from simpler life forms that lived millions of years ago. By comparing fossils from older and newer layers of rock, scientists can see how things have changed over time. When living things reproduce, they pass on characteristics to their offspring - inheritance. Variation explains the different features and characteristics of living things. Variation is a key |

| | | | | | | |
|---|---|---|---|---|---|---|
| | the day is shorter than the night. Different seasons lead to changes in plant and animal behaviour. | around the world. Each habitat has specific features like temperature, water availability, and types of food that meet the needs of the different animals and plants living there. Living things depend on each other. A simple food chain shows the flow of food (energy) from one living thing to another. For example, grass (producer) is eaten by a rabbit (prey), which is then eaten by a fox (predator). | keep the plant steady and upright in the soil. Root hairs absorb water and nutrients (food) from the soil. Stem: carries water and nutrients to different parts of the plant. The stem of a tree is called its trunk. This often divides into smaller branches. Leaves: Use light from the Sun, along with carbon dioxide from the air and water to make food for the plant. Flowers: are involved in plant reproduction and | refers to the surroundings or conditions in which living things exist and interact. This can be made up of natural and human-made features. Humans affect the environment in many ways for different reasons. Changes to environments can damage habitats and cause danger to animals and plants that live in them, including us. Conservation is the careful protection | development of characteristics, such as growth of body hair, changes in voice pitch and the onset of reproductive capabilities. Generally, the larger the animals, the longer the gestation period. The human gestation period is nine months. | factor in the evolution and adaptation of living things to their environments. Natural selection is the process by which living things with traits better suited to their environment are more likely to survive and reproduce, passing those beneficial traits on to their offspring. Adaptation is the process by which living things develop traits or characteristics that enhance their ability to survive and reproduce their |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | | **Context: Plants**<br>Plants can grow from seeds and bulbs. Germination is the process where seeds grow into plants. Most seeds and bulbs need water to grow. Seeds and bulbs have a store of food inside them. Plants need these things to grow and keep them healthy: water, light, suitable temperature, air. The cycle from seed to plant to flower to seed is called a | produce seeds from which new plants grow. Plants need water to make their own food. Water is absorbed and transported through the stem, leaves and roots. All plants are alive. They need air (carbon dioxide), light, water, nutrients, and the right temperature to grow and stay healthy. Many plants rely on animals and insects (like bees) to reproduce. To make a seed, a flower | and management of our natural environment to keep it healthy and balanced for the benefit of all living things, now and in the future. | | specific environment.<br><br>**Context: Animals, Including Humans**<br>The circulatory system has three main parts: the heart (a muscular organ that pumps blood), blood vessels (arteries, veins and capillaries), and blood (which carries oxygen, nutrients, hormones, and waste products). The circulatory system transports nutrients, water and oxygen to the entire body. Blood is made from four parts: red blood cells - transport oxygen, while blood |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | lifecycle. | needs to be pollinated. This means that pollen from one flower needs to travel to another. Bees and other animals move pollen from plant to plant. This is called pollination. | | | cells - protect against disease, blood platelets - help blood to clot and form scabs to repair a cut, plasma - a yellowy liquid that carries these cells and important nutrients around your body. When you engage in physical activity, especially aerobic exercise like running or cycling, your heart rate typically increases. This is because your muscles require more oxygen and nutrients to meet increased demand for energy during |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | exercise. The heart responds by pumping more blood, leading to a higher heart rate. The circulatory system transports water and nutrients around the body. Not all animals have the same system - some have double circulatory systems and some have single, some have closed circulatory systems and some have open. It is important to eat a healthy diet for our brains to concerntrate, bodies can fight off infections and that we |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | do not become overweight which cna cause long-term poor health. We need sleep to help us recover and recharge. This is good for our mental health and physical health. Some drugs are helpful, like medicines, that should be taken according to instructions. Taking drugs, drinking alcohol and smoking can have very harmful effects on our bodies. They are highly addictive which means it can be difficult to stop and |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | this has damaging, long-term effects on our bodies. |
| | Threshold Concept: Chemistry | | | | | |
| | **Context: Materials**<br>An object is something that you can touch. A material is what the object is made from. Properties s a word that helps us to describe the characteristics (look or feel) of different materials. We can group different materials together based on their properties. Materials which have the property of being absorbent, soak up liquids. For | **Context: Everyday Materials**<br>Everyday objects are made from materials that have different properties. Different materials have properties that make them suitable for specific purposes and uses. The shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching. | **Context: Rocks**<br>Rock, or stone, is a hard material. Different groups of rock have their own unique appearance and set of physical properties. Sedimentary rocks are laid down in layers which are made from broken up bits of other rocks and remains of animals and plants that have been squashed together. They can be soft and wear away easily. | **Context: States of Matter**<br>Solids, liquids and gases are called the three states of matter. Each one has its own unique set of properties. Solids: stay in one place, can be held, keep their shape, always take up the same amount of space and can be cut or shaped. Liquids: flow or can be paused (not easy to hold) and change their shape depending on the | **Context: Properties and Changes of Materials**<br>A thermal conductor is a material that lets heat pass through it easily. Thermal: anything related to heat. Conductor: something that allows the flow of a particle thing. A thermal insulator is a material that reduces or prevents the transfer of heat. Insulator: is a material or substance that does not easily allow the | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | example, water. Waterproof means that water cannot pass through an object or material. It is a material that keeps water out. | | Igneous rocks are made when molten rock (lava or magma from a volcano) cools down. They are very hard and do not wear away easily. Metamorphic rocks are rocks that have been changed over time by intense heat and pressure deep underground. They are hard and can be polished. Some rocks are more durable than others. These rocks are good for building as they last a long time without breaking or getting weaker. Some rocks, such | container they are in; they always take up the same amount of space (volumes stays the same). Gases: are often invisible, do not have a fixed shape (they spread out and change their shape and volume to fill whatever container they are in); they can be squashed. When some solids are heated, they melt and turn into a liquid. The temperature this happens at is called the melting point, and is measured in degrees Celsius (°C). | transfer of electricity, heat or sound properties, including thermal conductivity, Materials that make the best thermal insulators are typically those that trap air well. These materials trap small pockets of air that act as barriers to slow down the transference of heat, helping to keep things warm or cool. Air is a good insulator because it is a poor conductor of heat. A reversible change in science is a change that can be undone or reversed, and the original | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | as sandstone or chalk, let water soak through them. They are called permeable rocks. Other rocks, such as slate, do not let water soak through them. They are called impermeable rocks. Fossils are the preserved remains of a dead plant or animal. Fossils come in all shapes and sizes. Fossils are formed through a process of multiple stages called fossilisation, and this takes place over many, many years. Soil is made from organic matter - dead | When a liquid is cooled, it freezes and turns into a solid. Freezing happens at the same temperature as the melting point. When water (a liquid) is heated, it turns into water vapour (a gas) and evaporates. When water vapour (a gas) is cooled, it condenses and changes back into water (a liquid). Higher temperatures speed up evaporation and lower humidity (dry air) helps things dry faster. | substance or materials can be recovered. Filtering is a method to separate a solid from a liquid in a mixture. It involves passing the mixture through a filter, often made of paper or another porous material. The liquid passes through, leaving the solid behind. Seiving is a method to separate different sized particles in a mixture. A sieve, which is a tool with holes of a specific size, is used. Smaller particles pass through the holes, while larger ones are retained. Evaporation | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | rotting plants, rock, air and water. Soil also contains lots of animals, for example, earth worms and micro-organisms too tiny to see with the naked eye. | | is a method to separate a solute from a solvent to a mixture. It involves heating the mixture to allow the solvent to turn into vapor and leave the solute behind. The vapor can be condensed back into a liquid. An irreversible change is a permanent change that creates something new or different. It cannot be undone. | |
| | Threshold Concept: Physics | | | | | |
| | | | **Context: Forces and Magnets**<br>We need forces to make things move. A contact force can be a push or pull. We can make | **Context: Sound**<br>Sounds are made when objects vibrate. This makes the air around the object vibrate and | **Context: Earth and Space**<br>Life can survive on Earth because the Earth's position in the solar system means we have | **Context: Electricity**<br>A circuit will always have a battery as well as other components (bulbs, buzzers, switches, motors |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | things move faster, slower or even stop if the size of the force changes.<br>A contact force can work against the movement of an object and act in the opposite direction. Some surfaces affect the movement of an object more than others. Not all forces need contact: a magnetic force can act at a distance. Magnets have two ends. These are called the north pole and south pole. When two of the same poles are placed closed together, | their air vibrations then travel to and enter your ear.<br>Sound waves can travel through solids, liquids and gases.<br>Strong vibrations (more energetic sound waves) make sound appear louder. Weak vibrations (less energetic sound waves) make sound appear quieter.<br>Sound decreases in volume as they get further from the sound source. This is because the sound vibrations decrease as they travel through the medium. Soft and | energy, the right temperature and a stable climate. The Earth rotates around the Sun whilst also spinning on its axis. At the same time, the Moon is orbiting the Earth. This is a constant repeating pattern. The Moon orbits the Earth and spins on its axis once each time it orbits the planet. The Sun, Earth and Moon are approximately spherical bodies.<br>The Earth is one of the eight planets that orbit around the Sun. The planets are called Mercury, Venus, Earth, Mars, | which need the battery to work).<br>When drawing circuit diagrams we use simple symbols to represent different components.<br>Increasing the number of batteries/cells in a circuit can increase the voltage travelling to the bulb or buzzer, usually making it brighter or louder.<br>Adding more bulbs in a circuits, means more energy (voltage) is required to keep the brightness the same. If the voltage is not increased, this will affect the brightness of the bulbs.<br>The more |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | they repel (push apart) each other. When close they attract (pull together) each other. Magnets are metals that attract other metals. Every magnet is a metal, but not all metals are magnets. Magnets can vary in strength based on their size, shape and the type of material from which they are made. Some magnets are stronger than others.<br><br>**Context: Light**<br>We need light to see. Light can come from many | dense materials are generally good at providing insulation against sound. This is because they absorb or prevent sound waves from travelling through. The pitch of a sound is how high or low the sound is. A high sound has quick vibrations and produces a low pitch.<br><br>**Context: Electricity**<br>Electricity can be dangerous, and we need to know how to work safely with it. Some appliances require mains electricity, and some require batteries to operate. | Jupiter, Saturn, Uranus and Neptune.<br>The Earth rotates constantly on an axis. It takes 24 hours for a full rotation. When parts of the Earth face the Sun, it is daytime. When Earth is facing away from the Sun, it is night-time. Shadows change throughout the day as the Earth rotates on its axis. Shadows are longer when we are further away from the Sun and shooter when we are closer to the Sun. Shadows change direction during the day as the Earth | components, the more energy they use and so the bulb is not as bright and the buzzer not as loud. A switch opens and closes the circuit. When the switch is open the electricity cannot flow and therefore the component will not light/sound or the motor will not work. The battery provides the power source. Electricity will only travel around a circuit that is complete. When the circuit is complete, the electricity flows around the circuit. The electrical energy is converted to light energy in the bulb. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | different sources, such as the Sun, starts, torches, lamps and candles. Reflection involves a source of light and a surface. The light travels towards the surface and bounces off. When light from an object is reflected by a surface, it changes direction. Smooth, shiny surfaces such as mirrors and polished metals reflect light well. Dill and dark surfaces, such as dark fabrics, absorb light. A shadow is a dark shape formed when | Appliances convert electrical energy into other types of energy.<br>A circuit always needs a power source, such as a battery, with wires connected to both the positive (+) and negative (-) ends. A circuit can also contain other electrical components, such as wires, bulbs, buzzers or motors, which allow electricity to pass through. Electricity will only travel around a circuit that is complete. When a switch is open (off), there is a | rotates from west to east.<br><br>**Context: Forces**<br>Friction is a force between two surfaces that are in contact and sliding, or trying to slide, across each other. Friction always slows a moving object down. Gravity is a force that acts at a distance. Gravity attracts all objects towards each other. Larger objects have a stronger gravitational pull so heavy and light objects fall at the same speed. Everything is pulled to the Earth by gravity. This causes | The switch opens and closes the circuit. If the circuit is broken, the electricity cannot flow so the bulb won't light and/or the buzzer wont sound.<br><br>**Context: Light**<br>Light travels in straight lines. When a beam of light from the light source hits an object, it is reflected by the object and travels in straight lines to our eyes. Our eyes take in some of this light and information is sent to the brain - how we see the object.<br>When a beam of light hits a smooth and shiny surface, that ray is called the |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | light is stopped or blocked by an object or person. Shadows show the shape and size of the object that's blocking the light. They change in size and shape depending on the angle and position of the light source and the object. In the morning shadows are longer when the Sun is lower. As the day goes on, shadows get shorter when the Sun goes higher. In the evening, shadows get longer again as the Sun starts to go down. | gap in the circuit. When a switch is closed (on), it makes the circuit complete. Electricity can travel around the circuit. Some materials let electricity pass through them easily. These materials are known as electrical conductors. Many metals like copper, iron, and steel are excellent conductors. This is why parts of electrical divides that require electricity to pass through them are often made of metal. Some | unsupported objects to fall. Air resistance is a type of friction between air and another material. It is a force that opposes the movement of an object as it moves through the air. Objects with a large surface area create more air resistance so they move more slowly through air. Water resistance is fraction between water and an object that is moving through water. This force acts upwards against gravity when an object is falling through water. If the upthrust is less than | incident ray. This hits the mirror at an angle. The ray of light then bounces off the mirror (is reflected) and this is called the reflected ray. Refraction happens when light changes direction, or bends when it moves from one transparent material to another. Refraction happens when light changes direction, or bends, when it moves from one transparent material to another. This can also cause light to separate into its different colours. This band of colours is called the spectrum. |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | materials do not allow electricity to pass through them. These materials are known as electrical insulators. They are applied as protective coatings for conducting materials. The plastic insulation around wires serves as an insulator, safeguarding against electrical shocks.<br>A circuit always needs a power source, such as a battery, with wires connected to both the positive and negative ends. A circuit can also contain other | the weight of the object, the object will sink. If the upthrust is equal to the weight of the object, the object will float.<br>Some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. | |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

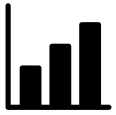
| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | electrical components, such as wires, bulbs, buzzers or motors, which allow electricity to pass through. Electricity will only travel around a circuit that is complete. | | |
| **Experimental and Investigation Skills**  | Ask simple questions.<br>Verbally state what they are going to investigate.<br>Observe closely.<br>Carry out simple tests using non-standard units of measurement where appropriate.<br>Gather and record simple data.<br>Classify and group objects and living | Ask simple questions and recognise that they can be answered in different ways.<br>Make simple predictions based on a question.<br>Identify what they will change and keep the same.<br>Observe closely using simple | Ask questions and understand there are different enquiry types they could use to answer them.<br>Make relevant predictions.<br>Identify what they will change, observe and keep the same.<br>With support, set up simple practical | Ask relevant questions and use different types of scientific enquiry to answer them.<br>Make predictions based on simple scientific knowledge.<br>Identify what they will change, observe or measure and keep the same | Ask scientific questions and begin to understand which questions would be best suited to each enquiry type.<br>Make predictions based on scientific knowledge.<br>With support plan different types of scientific enquiry.<br>Where appropriate, | Ask relevant scientific questions and choose which enquiry type would be best suited to answer them.<br>Make predictions based on scientific knowledge.<br>Plan different types of scientific enquiries to answer questions, including recognising and controlling |

| | | | | | | |
|---|---|---|---|---|---|---|
| | things into groups based on simple properties. | equipment.<br>Perform simple tests using standard units of measurement where appropriate.<br>Gather and record data to help in answering questions.<br>Identify and classify data gathered, along with objects and living things. | enquiries.<br>Begin to use scientific equipment to make observations.<br>Carry out tests and simple experiments and take measurements using standard units.<br>Gather and record data in different ways to help answer questions.<br>Record findings using simple scientific language, drawings, labelled diagrams, bar charts and tables. | Set up simple practical enquiries, comparative and fair tests.<br>Make systematic and careful observations.<br>Take accurate measurements using standing units of measurement, using a range of equipment, including thermometers and data loggers.<br>Gather, record and classify data in a variety of ways to help answering questions. | identify the dependent and independent and controlled variables.<br>Use a range of scientific equipment to make systematic and careful observations.<br>Take accurate measurements using a range of scientific equipment. Start to take repeat readings when appropriate.<br>Gather, record and classify data with increased complexity to help answering questions.<br>Record data using scientific diagrams | variables where necessary.<br>Use a range of scientific equipment to make systematic and careful observations with increased complexity.<br>Take measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.<br>Record data and results of increasing complexity using scientific diagrams and labels, classification keys, |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | Record findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables. | and labels, classification keys, tables, bar and line graphs. | tables, scatter graphs, bar and line graphs. |
| **Analysis and Evaluation of Results**  | With support and scaffolding, make verbal predictions. Explain what they found out to an adult or partner. Answer simple questions. | Make simple verbal predictions. Talk about what they have found out and how they have found it out. Use their observations and ideas to suggest answers to questions. | Make verbal predictions. Report findings from enquiries, including oral and written explanations. Make simple conclusions. Use results, findings or observations to answer questions. Suggest questions for further investigation. | Report findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Use straight-forward scientific evidence to answer questions or to support their | Report and present findings from enquiries, including conclusions. Begin to identify casual relationships in oral and written forms such as displays and other presentations. Use scientific evidence to answer questions. Make conclusions based on scientific | Report and present findings from enquiries, including conclusions, casual relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations. Use scientific evidence to answer questions. Make conclusions |

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | findings.<br>Use results to draw simple conclusions.<br>Begin to identify differences, similarities or changes related to simple ideas or processes<br>Begin to make predictions for new values, suggest improvements and raise further questions. | evidence and from their own testing and findings.<br>Identify differences, similarities of changes related to simple ideas or processes.<br>Make predictions, for new values, suggest improvements and raise further questions. | based on scientific evidence and from their own testing and findings.<br>Identify scientific evidence that has been used to support or refute ideas of arguments.<br>Use test results to make predictions to set up further comparative and fair tests.<br>Suggest investigation improvements including accuracy of results.<br>Provide some simple examples of how to extend the investigation. |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| **Scientific Oracy and Literacy**  | Use verbal communication or simple sentences to present findings. Make observational statements. Pronounce specific vocabulary accurately during discussions most of the time. Begin to read and spell scientific vocabulary correctly either phonetically plausibly or correctly most of the time. Record data using: venn diagrams, drawings. | With support, record their findings in explanatory sentences. Begin to decide how to present evidence. Use and pronounce scientific vocabulary accurately. Read and spell scientific vocabulary correctly. Record data using: venn diagrams, drawings/ diagrams, a table, a bar chart. | With support, record their findings in explanatory sentences. Use and pronounce scientific vocabulary accurately most of the time. Read and spell scientific vocabulary correctly. Record data using: venn diagrams, drawings/ labelled diagrams, a table, a bar chart, physical models, storyboards, yes/no classification keys, graphs, simple | Gather, classify and present their evidence in a variety of ways. Including using explanatory paragraphs, drawing, diagrams, charts and tables. Begin to decide for themselves how to present evidence. Read and spell scientific vocabulary correctly. Record data using: venn diagrams, drawings/ labelled diagrams, a table, a bar chart, physical models, storyboards, | Present their evidence, findings and conclusions in a variety of ways. Including writing explanatory paragraphs, oral forms, drawings, diagrams, charts and tables. With support, decide for themselves how to present evidence. Use and pronounce scientific vocabulary accurately during discussions. Read and spell scientific vocabulary correctly most of the time. Record data using: venn diagrams, | Report and present their findings from enquiries, including conclusions, casual relationships, explanations of and degree of trust in results, in oral and written forms. Choose appropriate means of presenting findings. Use and pronounce scientific vocabulary consistently accurately during discussions. Read and consistently correctly spell scientific vocabulary. Record data using: venn diagrams, drawings/ labelled |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | research reports. | classification keys, graphs, food chains, simple research reports. | drawings/ labelled diagrams, a table, a bar chart, physical models, storyboards, classification keys, graphs, food chains, simple research reports. | diagrams, a table, a bar chart, physical models, storyboards, classification keys, graphs, food chains, simple research reports. |
| Key Vocabulary | Threshold Concept: Biology | | | | | |
| | **Head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth, tongue, feet, hands, skin, senses, ears/hearing, hands/touch, nose/smell, eyes/sight, tongue/taste, birds, fish, feathers, scales, breathe, lay, young, diet.** Characteristic, cold-/ | **Growth, human, child, toddler, teenager, adult, survive, shelter, exercise, muscles, heart, lungs, brain, meat, fruit, vegetables, dairy, fat, sugar, healthy portion.** Offspring, lifecycle, limbs, reproduce, energy, air (oxygen), temperature, | **Growth, carbohydrate, fat, protein, dairy, domestic, pet, environment, diet, behaviour, company, health and welfare, skeleton, skull, ribcage, spine, muscle, relax, contract, physical activity, exercise, muscle growth, strength.** Nutrition, energy, calcium, joints, organs, triceps, biceps. | **Teeth, digestive system, mouth, tongue, stomach, adaptation, energy, prey, predator.** Incisor, canine, molar, premolar, carnivore, omnivore, herbivore, oesophagus, small and large intestine, food chain, producer, primary/ | **Lifecycle, natural world, expertise, observe, document, study.** Stages of development, sexual, asexual, reproduction, larvae, embryo, metamorphosis, naturalist, sexual/asexual reproduction, pistal/carpel, stigma, style, ovary, stamen, | **Insects, algae, moss, fern, conifer, bacteria.** Vertebrate/ non-vertebrate, taxonomy, arachnids, crustaceans, millipedes, annelids, echinoderms, molluscs, coelenterates, dichotomous key, ginkgoes, angiosperms, microorganisms, |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | warm-blooded, mammal, reptile, amphibian, carnivore, omnivore, herbivore.<br><br>**Plants, wild plants, garden plants, weeds, trees, seeds, root, shoot, soil, magnifying glass, flower, petal, stem, leaf/leaves, tree, trunk, bark, branch, blossom, acorn.** Local plant names, hand lens, common tree names, deciduous, evergreen.<br>**Season, changes, autumn, winter, spring, summer, weather, sunrise, sunset.** Temperature. | hygiene, mental health.<br><br>**Living, features, move, feed, grow, senses, shelter, depend/survive, suitability, transfer, environment.** Reproduce, habitat, microhabitat, energy, food chain, producer, prey, predator.<br><br>**Seed, bulb, plant, protect, mature, roots, shoot, food supply, temperature.** Seed coat, food store, seed leaves, germination, nutrients, absorb, energy, lifecycle, reproduce. | **Seed, parent plant, roots, stem, leaves, trunk/branches, flowers, transport, absorb, tubes, air, light, temperature, flower, pollen, nectar, attract.** Dispersal, germination, root hair, function, nutrients, carbon dioxide, nutrient, drought, climate, pollination, reproduce. | secondary/ tertiary consumer.<br><br>**Group, category, key, flowering, non-flowering, environment, surroundings, conditions, natural, human-made, endangered, extinct, positive, negative, indifferent, protect, manage, impact.** Classification, vertebrate, invertebrate, spores, dichotomous key, urbanisation, deforestation, pollution, fossil fuels, natural disaster, human impact, Venn diagram, conversation. | anther, nectar, pollen, pollination, fertilisation, dispersal, tuber, bulb, runner, clone, vegetative, propagation, sperm, egg, external./internal fertilisation.<br><br>**Toddler, stages, lifecycle, puberty, pubic hair, breasts, periods, womb, chemical, mass.** Embryo, foetus, adolescent, hormones, genes, DNA, oestrogen, testosterone, pituitary gland, reproduction, menstruation, gestation period, viviparous, zygote. | microbes, fungi, protists.<br><br>**Diversity, siblings, characteristics, traits, habitats, climate extinction, crossbreed.** Evolution, mould/ body/ trace/ cast fossil, fossil record, species, variation, inheritance, inherited/ environmental variation, selective-breading natural selection, adaptation, organism, pollinators.<br><br>**Pump, heart, lifestyle, drugs, medicine, illegal, vitamins.** Circulatory system, organ, blood vessels, arteries, veins, capillaries, living |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | | | | cells, oxygen, carbon dioxide, deoxygenated, oxygenated, platelets, plasma, red/white blood cells, antibodies, single/double circulatory system, nicotine, caffeine, proteins, stimulant, hallucinogen, depressant, ethanol. |
| | Threshold Concept: Chemistry | | | | | |
| | **Object, wood, plastic, metal, rock, water; hard/soft; stretchy/stiff; shiny/dull; rough/smooth; bendy/not bendy; waterproof/ not waterproof.** Properties, material, opaque/transparen | **Wood, metal, plastic, glass, brick, rock, paper, cardboard, strong, waterproof, bounce, grip (sole), squash, bend, twist, stretch, stretchy/ not stretchy, fabric.** Property, material, object, suitability, | **Rock, material, Earth, remains, heat, pressure, durable, absorb, preserve, decay, earthworm, leaves, soil.** Mineral, formation, physical properties, metamorphic, sedimentary, | **Melt, temperature, freeze.** States of matter, solid, liquid, gas, matter, mass, volume, particles, properties, water vapour, melting point, freezing point, condensation, | **Material, mixture, burning, rust.** Thermal, conductor, insulator, transference, independent/ dependent/ controlled variable, dissolve, solid, liquid, gas, states of matter, solution, filtration, | |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | t, absorbent/not absorbent. | purpose, solid, fair test. | igneous, grains, molten, magma, lava, crystals, permeable, impermeable, sediment, fossil, palaeontologist, fossilisation, organic matter, erode. | evaporation, water cycle, precipitation. | sieving, evaporation, permeable, vapour, particles, irreversible, chemical changes, acid. | |
| | Threshold Concept: Physics | | | | | |
| | | | **Push, pull, surface, movement, direction, magnet, attract, repel, north pole, south pole, metal, iron, steel, nickel.** Contact/ non-contact force, magnetism, horseshoe/bar/ring magnet.<br><br>**Light, reflect, visible, visibility,** | **Sound, vibrate/vibrations, medium, volume, distance, decrease, insulation.** Energy, sound wave, sound source, insulator, pitch.<br><br>**Appliance, mains electricity, battery, generated, power station, electrical energy, pylon, plug socket.** | **Earth, Sun, Moon, planet, star, solar system, rotate, seasons, shadows, position, 24 hours, daytime, night-time.** Orbit, atmosphere, scale, heliocentric, geocentric, planetary movement, axis.<br><br>**Simple machine, effort, load, float, sink, streamlined.** Friction, resistance, | **Symbol, device.** Series circuit, cell, battery, component, voltage.<br><br>**Beam, ray, shadow, cast, object, reflect, light source.** Energy, distortion, factor, incident ray, reflected ray, angle of incidence, angle of reflection, normal line, phenomenon, |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | | | **dark, shiny, bright, dull, matt, mirror, angle, absorb, shadows, position, direction, damage, protection, sunrise, sunset, rotation, compass direction.** Light source, opaque, translucent, transparent, filters, UV rays, retina, pupil. | Convert, series circuit, component, bulb (lamp), lamp holder, buzzer, cell, battery, wire, crocodile clip, electrical conductor, electrical insulator. | force-meter, contact force, gravity, gravitational pull, mass, matter, air resistance, water resistance, drag, upthrust, displace, lever, pulley, gear, transmission, mesh, axle, fulcrum, pivot, mechanism, redirecting force. | refraction, spectrum, prism. |
| | Disciplinary | | | | | |
| | Question, answer, observe, identify, classify, test. Communicate, compare, data, enquiry, equipment, gather, group, measure, pattern, practical activity, record, relationship, | Answer, classify, communicate, compare, data, enquiry, equipment, gather, group, identify, measure, observe, pattern, practical activity, question, record, relationship, | Analyse, bar change, chart, classify, comparative test, conclusion, data, data logger, diagram, display, enquiry, equipment, evidence, explain, fair test, findings, gather, group, | Analyse, bar chart, classify, comparative test, conclusion, data, data logger, diagram, enquiry, equipment, evidence, explain, fair test, findings, gather, group, identify, key, | Casual relationship, classification key, comparative test, conclusion, control diagram, enquiry, evidence to support/'refute, fair test, graph(scatter/ bar/ line), information-record, measurement, | Casual relationship, classification key, comparative test, conclusion, control, diagram, enquiry, equipment, evidence to support/ refute, fair test, graph (scatter/ bar/ line), information-record, measurement, |

St John's Progression Document

Our school drivers are: SMSC (Spiritual, Moral, Social and Cultural Capital), Learning Behaviours and Possibilities

Subject: Science

| | | | | | | |
|---|---|---|---|---|---|---|
| | secondary source, sort. | secondary source, sort, test. | identify, key, measurement, note, observe, pattern, predict, present, process, question, record, relationship, results, secondary source, similarity, sort, standard unit, systematic, table, thermometer, value. | measurement, note, observe, pattern, predict, present, process, question, record, relationship, results, secondary source, similarity, sort, standard unit, systematic, table, thermometer, value. | observation, pattern, prediction, repeat reading, research, results, secondary source, table, variable. | observation, pattern, prediction, repeat reading, research, results, secondary source, table, variable. |
| **Assessment/POP Task** | Supported verbal/ short written responses (conclusions) to each enquiry question studied each lesson. | Supported written responses (conclusions) to each enquiry question studied each lesson. | Write responses (conclusions and reports) to enquiry questions studied each lesson. Supported in the short paragraphs structure. | Supported written predictions. Write responses (conclusions and reports) to enquiry questions studied each lesson including reference to evidence. | Write predictions. Write responses (conclusions and reports) to enquiry questions studied each lesson including reference to evidence. | Write scientific hypotheses. Write responses (conclusions and reports) to enquiry questions studied each lesson including reference to evidence. |