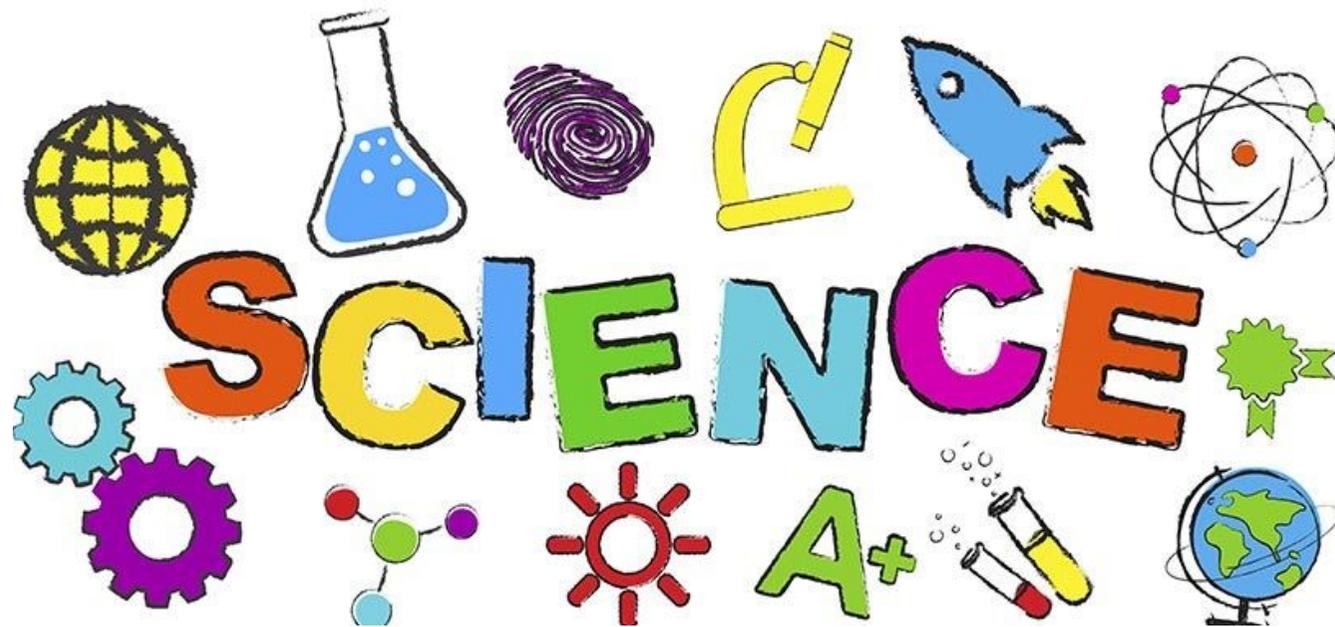


Brockton C.E Primary School





Brockton C.E. Primary School

Skills Progression - Science



Level Expected at the End of EYFS

Understanding the World (The World)

Children know about similarities and differences in relation to places, objects, materials and living things. They talk about the features of their own immediate environment and how environments might vary from one another. They make observations of animals and plants and explain why some things occur, and talk about changes.

Physical Development (Health and Self-Care)

Children know the importance for good health of physical exercise, and a healthy diet, and talk about ways to keep healthy and safe.

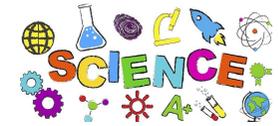
Level Expected at the end of Key Stage 1/ Key Stage 2

Key Stage 1 National Curriculum Working Scientifically	Lower Key Stage 2 National Curriculum Working Scientifically	Upper Key Stage 2 National Curriculum Working Scientifically
<p>During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • asking simple questions and recognising that they can be answered in different ways • observing closely, using simple equipment • performing simple tests • identifying and classifying • using their observations and ideas to suggest answers to questions • gathering and recording data to help in answering questions. 	<p>During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • asking relevant questions and using different types of scientific enquiries to answer them • setting up simple practical enquiries, comparative and fair tests • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions • identifying differences, similarities or changes related to simple scientific ideas and processes; using straightforward scientific evidence to answer questions to support their findings. 	<p>During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:</p> <ul style="list-style-type: none"> • planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary • taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate • recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • using test results to make predictions to set up further comparative and fair tests • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations; identifying scientific evidence that has been used to support or refute ideas or arguments.



Brockton C.E. Primary School

Science - Progression of key skills



Intent

It is our intention that through our Science curriculum we develop in all young people a lifelong curiosity and interest in the sciences. When planning the science curriculum, we intend for children to have the opportunity, wherever possible, to learn through varied systematic investigations, leading to them being equipped for life to ask and answer scientific questions about the world around them. As children progress through the year groups, they build on their skills in working scientifically, as well as on their scientific knowledge, as they develop greater independence in planning and carrying out fair and comparative tests to answer a range of scientific questions. Our scheme of work, which draws on a range of sources to engage our children, ensures that children have a varied, progressive and well-mapped-out science curriculum that provides the opportunity for progression across the full breadth of the science national curriculum for KS1 and KS2.

Implementation

The acquisition of key scientific knowledge is an integral part of our science lessons. Linked knowledge organisers enable children to learn, retain and reinforce key scientific vocabulary and knowledge contained within each unit. The progression of skills for working scientifically are developed through the year groups and scientific enquiry skills are of key importance within lessons. Each lesson has a clear focus. Scientific knowledge and enquiry skills are developed with increasing depth and challenge as children move through the year groups. They complete investigations and hands-on activities while gaining the scientific knowledge for each unit. Teachers are aware that pupil cohorts may be starting the planning cycles at different points, and so enable opportunities to recap/introduce concepts where necessary. The sequence of lessons helps to embed scientific knowledge and skills, with each lesson building on previous learning. There is also the opportunity to regularly review and evaluate children's understanding. Activities are effectively differentiated so that all children have an appropriate level of support and challenge, particularly important as our classes consist of more than one year group. Teachers are equipped with secure scientific subject knowledge, enabling them to deliver high-quality teaching and learning opportunities while making them aware of possible scientific misconceptions.

Impact

Using a full range of resources, including display materials, will result in an increase in the profile of science across the school. The learning environment across the school will be more consistent with science technical vocabulary displayed, spoken and used by all learners. Whole-school and parental engagement will be improved through the use of science-specific home learning tasks and shared use of knowledge organisers. Progress will be seen through a child's ability to know more, understand more and explain more. This can be measured in different ways. Children who feel confident in their science knowledge and enquiry skills will be excited about science, show that they are actively curious to learn more and will see the relevance of what they learn in science lessons to real-life situations and also the importance of science in the real world. Attainment and progress can be measured across the school using our school assessment sheets. Impact can also be measured through useful, low time consuming methods such as key questioning skills built into lessons, child-led assessment such as success criteria grids, and summative assessments aimed at targeting next steps in learning.



Scientific Knowledge Progression

Themes	Class 1 Nursery/Key Stage 1	Class 2 Years 2 and 3	Class 3 Years 4, 5 and 6
<p>Animals Including Humans</p>	<p><u>Amazing Me!</u></p> <p>Pupils will describe the external parts of the human body and learn the basic needs of human beings. They will look at a range of familiar and unfamiliar British animals and establish some ideas about what constitutes an animal. They will learn that animals belong to one of six main groups: birds, fish, amphibians, reptiles, mammals and invertebrates. And that each class has different characteristics and sometimes different body parts. They learn the names of some common British animals and research one animal in more detail.</p>	<p><u>Africa - Animals and Skeletons/ Living Things - Years 2 and 3 units</u></p> <p>Pupils classify things as living, once alive and never alive. They learn about the characteristics of living things and building and observing a wormery and going outside to hunt for examples of living and non-living things. They look for characteristic of life in plants and establish that plants are living things.</p> <p>Pupils revisit the classification of animals according to diet as carnivores, herbivores or omnivores, researching the diets of animals in more detail. They look at human dietary requirements and begin to identify different food types and their different uses in the body. Dissecting an owl pellet provides a link between learning about diets and the study of skeletons. Pupils learn about external and internal skeletons, making a life size skeleton diagram and studying the names and functions of the major bones in the human skeleton.</p> <p><u>Chocolate - Animals and their needs</u></p> <p>In this unit pupils begin by learning about the stages of human growth. They learn that animals grow until they are adult and that that different animals start life in different forms, some as eggs and some as live births and they look at the needs of the young of different species. Throughout the unit they observe some animals as they grow, both in the classroom, and through webcams on the Internet</p>	<p><u>Rivers</u></p> <p>Pupils study the circulatory system, learning about the basic components that make up blood, how the heart works and how blood circulates round the body. They learn about the lungs and the process of breathing and investigate the effect of exercise on the heart and breathing rates. They learn about the effects of smoking and alcohol.</p> <p>Pupils build on their knowledge of classification from previous years and look at the classification of invertebrates and microorganisms in more detail and playing games to help them learn about microorganisms and classes of invertebrates.</p> <p><u>National Parks</u></p> <p>Pupils learn about the variety of living things and how they can be grouped according to shared characteristics. They use and construct keys to identify unfamiliar animals and plants</p> <p><u>The British Empire</u></p> <p>Pupils revisit the life cycle of plants, and learn about pollination. They compare the life cycles of birds, mammals, insects and amphibians and learn that insects and amphibians undergo metamorphosis.</p> <p>Use and evaluate some sampling techniques for environmental field work</p> <p>Compare populations of living things.</p> <p>Provide reasons for the changes in population</p> <p><u>The British Empire</u></p> <p>In this unit pupils learn about the structure of the mouth and about how to care for their teeth, investigating which drink stains teeth the most. They learn about the structure of the digestive system, build a model of the digestive process and make "poo", using their new knowledge to produce a piece of creative writing. The explore interrelationships in food, constructing food chains and food webs.</p>
<p>Living Things and their Habitats</p>	<p><u>Hot and Cold</u> Linked to geography unit</p> <p>How camels and penguins live in habitats to which they are suited and describe how different habitats provide for the basic needs of different animals.</p> <p><u>Our Environment</u></p> <p><u>Splash</u></p> <p>Pupils spend time learning about familiar and unfamiliar habitats such as woodland and the seashore. They work in the classroom and outdoors to look at animals and plants and further their knowledge of the variety of life in different places and they go pond dipping. They extend their knowledge of the diets of different animals to understand about food chains.</p>	<p><u>Chocolate - Animal Homes</u></p> <p>This unit is intended to be taught across the whole year with a minimum of two lessons in each term. Suggested core activities are intended to be carried out each term at least once. Pupils look at the "homes" that insects and birds need and make the school friendlier towards these creatures. They evaluate the success of the measures they have taken. Pupils also observe plants over time to explore the development of seeds and the life cycle of plants.</p>	<p><u>National Parks</u></p> <p>Pupils look at the area within and near the school grounds and at the impact of humans on the environment. They discuss the need to balance human requirements against those of the environment.</p>
<p>Plants</p>	<p><u>Going Green</u></p> <p>The pupils will learn the names of some common native flowering plants and trees. They will plant bulbs or seeds and observe their growth over a period of weeks. They will go outside to study plants and trees in wild and cultivated areas, making sketches and notes.</p> <p><u>Our Environment</u></p>	<p><u>Romans - Plants - Years 2 and 3 units</u></p> <p>Pupils carry out a long-term investigation of the factors that affect the growth of plants, observing and measuring their plants for the course of the unit. They learn about the main functions of the different parts of a plant and will study the life cycle of a flowering plant, including studying the structure of a flower and the different methods of seed dispersal.</p> <p><u>Africa - Animals and Skeletons/ Living Things - Years 2 and 3 units</u></p> <p>Pupils classify things as living, once alive and never alive. They learn about the characteristics of living things and building and observing a wormery and going outside to hunt for examples of living and non-living things. They look for characteristic of life in plants and establish that plants are living things.</p>	<p><u>The British Empire</u></p> <p>Pupils revisit the life cycle of plants, and learn about pollination. They compare the life cycles of birds, mammals, insects and amphibians and learn that insects and amphibians undergo metamorphosis.</p> <p>Use and evaluate some sampling techniques for environmental field work</p> <p>Compare populations of living things.</p> <p>Provide reasons for the changes in population.</p> <p><u>National Parks</u></p> <p>Pupils learn about the variety of living things and how they can be grouped according to shared characteristics. They use and construct keys to identify unfamiliar animals and plants</p>



Scientific Knowledge Progression

Themes	Class 1 Nursery/Key Stage 1	Class 2 Years 2 and 3	Class 3 Years 4, 5 and 6
Seasonal Changes	<p>Light and Dark observe changes across the four seasons</p> <p>The Weather Observe and describe weather associated with the seasons and how day length varies. The children will study different types of weather through making and using a weather station and looking at the weather around the World. They study different aspects of the weather and learn how different weather is associated with different seasons. They give different weather forecasts for different times of the year.</p> <p>Our Environment Know how to respect and handle living things in their environment. Use their own observations to describe the changes that take place in vegetation and animal life across the year. Use everyday terms to describe simple features living things or events they observe. Present evidence they have collected in simple templates.</p>		
Materials, Rocks and States of Matter	<p>Transport and Toys Pupils develop vocabulary to describe material properties. They carry out a range of simple tests on materials and investigate the best material to make a particular object.</p>	<p>Stone Age to Iron Age - Materials - Rocks - Years 2 and 3 units Pupils explore different materials and begin to link properties with the use of the material, carrying out an investigation to decide on the best material for a particular use and imagining what objects would be like if they were made from "silly" materials. They learn about the life of John Boyd Dunlop who invented the pneumatic tyre. Pupils explore the characteristics of rocks and learn their names. They carry out simple tests on different rocks and use chocolate to model how rocks are made. They explore the composition of soil and think about how soil is made. They learn about the formation of fossils and make their own model fossils. They look at pictures of dinosaur fossils and try to come to some conclusions about the living dinosaurs the fossils came from.</p>	<p>The Greeks The children will study dissolving and learn how to recover materials from a solution. They look at other methods of separating mixtures and carry out an investigation on 'sewage' to clean it up before discharge into a river. They investigate chemical reactions including burning and use a key and a series of simple tests to identify some mystery powders. They will learn about reversible and irreversible changes.</p> <p>The Tudors This unit is intended to be taught across the whole year with at least two lessons in each term. Pupils will carry out a number of visits in and around the school to look for evidence of decay. They will create a compost heap and observe it over time. Natural and man-made materials will be left in different places to see how well they break down. Pupils will also carry out a litter survey in the local area and report back through a school assembly.</p> <p>The British Empire Pupils learn that materials come in three states of matter: solid, liquid or gas. They identify materials as solids, liquids or gases, including some that are harder to classify such as sand or sponge. They learn how to use a thermometer and investigate changes of state. They learn about the water cycle.</p>
Forces and Magnets		<p>Egypt - Magnets Pupils explore magnetism and non-contact forces, suspending magnetic items in mid-air under the influence of magnetic forces. They test materials for magnetic properties and think about what materials are magnetic. They describe the properties of a magnet in simple terms and learn about the uses of magnets.</p>	<p>Anglo Saxons and the Vikings Pupils learn more about the forces of gravity and friction and investigate the friction of different surfaces. They study air resistance, investigate paper spinners falling, look at floating and sinking and build a self-righting boat. Learning about simple forces includes activities to study pulleys, gears and other simple machines and gives pupils the chance to use their knowledge of machines to build a catapult.</p>
Earth and Space			<p>Anglo Saxons and the Vikings Pupils study our solar system, learning about the relative movements of the planets and the Moon and relating these to the way we experience the Sun and the Moon on Earth. They carry out some research into planets and investigate the way meteorites have shaped the surface of the Moon.</p>
Light, Sound and Electricity		<p>Innovation and Invention - Light Pupils learn to distinguish a light source from reflected light. They learn that light travels in straight lines, study how we see and are taught how to protect their eyes. They investigate the transparency of fabrics using data loggers and carry out some experiments to find out about shadow formation.</p>	<p>World War II Can you investigate at what angle the lights need to be in order to give a specific height when the light beams meet? The children will need to use models of the approximate scale of the planes (a piece of card will suffice) and torches set a specific angle to then try to recreate the beams. They could then lower the 'plane' until the two beams touch, then this will allow them to create a table showing the angle of the beam compared to the height of the plane which the Dambusters used in order to create the ideal height at which to release the bouncing bombs.</p> <p>The Second World War showed an increased reliance on the use of electricity from creating circuits to power search lights, sending signals to set off air raid sirens and sending messages to different positions on the fighting line. As part of the messaging system the Army and Navy etc used the Morse code. Challenge the children to make their own electrical circuit which recreates a Morse code system, possibly even with a different switch for the longer and shorter light flashes.</p> <p>China - The Shang Dynasty Pupils listen to and identify sounds and learn how our ears work to detect sounds. They carry out experiments to help them learn about loudness and pitch and use data loggers to investigate the best material for muffling sound. They make and play musical instruments.</p>
Evolution and Inheritance			<p>The Tudors Pupils learn about the life and work of Charles Darwin and what is meant by the terms evolution and survival of the fittest. They learn how animals and plants are adapted to their environment. They investigate camouflage and find out how humans evolved. They carry out a simple experiment to model evolution and selective breeding.</p>

Animals Including Humans

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge	<p>Identify and name a variety of common animals that are birds, fish, amphibians, reptiles and mammals.</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (birds, fish, amphibians, reptiles and mammals, and including pets).</p> <p>Identify, name draw and label the basic parts of the human body and say which parts of the body is associated with each sense</p>	<p>Notice that animals, including humans, have offspring which grow into adults</p> <p>Find out about and describe the basic needs of animals, including humans, for survival (water, food and air)</p> <p>Describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.</p>	<p>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat</p> <p>Identify that humans and some animals have skeletons and muscles for support, protection and movement.</p>	<p>Describe the simple functions of the basic parts of the digestive system in humans</p> <p>Identify the different types of teeth in humans and their simple functions</p> <p>Construct and interpret a variety of food chains, identifying producers, predators and prey</p>	<p>Describe the changes as humans develop from birth to old age</p>	<p>Identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood</p> <p>Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function</p> <p>Describe the ways in which nutrients and water are transported within animals, including humans</p>
Working Scientifically	<p>Use observations to compare and contrast animals at first hand or through videos and photographs</p> <p>Describe how they identify and group animals</p> <p>Group animals according to what they eat</p> <p>Use their senses to compare different textures, sounds and smells</p>	<p>Observe, through video or first-hand observation and measurement, how different animals, including humans, grow</p> <p>Ask questions about what things animals need for survival and what humans need to stay healthy</p> <p>Suggest ways to find answers to their questions</p>	<p>Identify and group animals with and without skeletons and observe and compare their movement</p> <p>Explore ideas about what would happen if humans did not have skeletons</p> <p>Compare and contrast the diets of different animals (including their pets) and decide ways of grouping them according to what they eat</p> <p>Research different food groups and how they keep us healthy and design meals based on what they find out</p>	<p>Compare the teeth of carnivores and herbivores, and suggest reasons for differences</p> <p>Find out what damages teeth and how to look after them</p> <p>Draw and discuss their ideas about the digestive system and compare them with models or images.</p>	<p>Research the gestation periods of other animals and compare them with humans</p> <p>Find out and record the length and mass of a baby as it grows</p>	<p>Explore the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health</p>
Vocabulary	<p>Reptiles Survival Mammals Offspring Amphibians Calf (+ examples of each) Exercise Herbivore Hygiene Omnivore Carnivore</p>	<p>Reptiles Survival Mammals Offspring Amphibians Calf (+ examples of each) Exercise Herbivore Hygiene Omnivore Carnivore</p>	<p>Muscles Contract Relax Joints Nutrition Nutrients Carbohydrates Protein Fats Fibre Vitamins Minerals invertebrates vertebrates Digestive system Small Intestine Large Intestine Colon Saliva Canine Incisor Molar Producers</p>	<p>Muscles Contract Relax Joints Nutrition Nutrients Carbohydrates Protein Fats Fibre Vitamins Minerals invertebrates vertebrates Digestive system Small Intestine Large Intestine Colon Saliva Canine Incisor Molar Producers</p>	<p>Foetus Embryo Womb Gestation Development Puberty Life Cycle Fertilisation Reproduce Life Expectancy skeletal muscle digest circulatory system blood vessels lifestyle nutrients substances</p>	<p>Foetus Embryo Womb Gestation Development Puberty Life Cycle Fertilisation Reproduce Life Expectancy skeletal muscle digest circulatory system blood vessels lifestyle nutrients substances</p>

Living Things and their Habitats

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge		<p>Explore and compare the differences between things that are living dead and things that have never been alive</p> <p>Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants and how they depend on each other</p> <p>Identify and name a variety of plants and animals in their habitats including micro-habitats</p> <p>Describe how animals obtain their food from plants and other animals using the idea of a simple food chain and identify and name different sources of food</p>		<p>Recognise that living things can be grouped in a variety of ways</p> <p>Explore and use classification keys to help group identify and name a variety of living things in their local and wider environment</p> <p>Recognise that environments can change and that this can sometimes pose dangers to living things</p>	<p>Describe the differences in the life cycles of a mammal an amphibian an insect and a bird</p> <p>Describe the life process of reproduction in some plants and animals</p>	<p>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</p> <p>Give reasons for classifying plants and animals based on specific characteristics</p>
Working Scientifically		<p>Sort and classify things according to whether they are living, dead or were never alive, and recording their findings using charts</p> <p>Describe how they decided where to place things, exploring questions such as: 'Is a flame alive? Is a deciduous tree dead in winter?' and talk about ways of answering their questions.</p> <p>Construct a simple food chain that includes humans (e.g. grass, cow, human)</p> <p>Describe the conditions in different habitats and micro-habitats (under log, on stony path, under bushes) and find out how the conditions effect the number and type of plants and animals that live</p>				
		Living habitat Energy Food chain Predator Prey Woodland desert Source Adapt	Vertebrates Invertebrates Environment Human impact	Vertebrates Invertebrates Environment Human impact	Life Cycle Mammal Reproduction Amphibian Offspring Classify Classification domain kingdom phylum class family genus species characteristics micro-organisms organism flowering non-flowering	Life Cycle Mammal Reproduction Amphibian Offspring classify classification domain kingdom phylum class family genus species characteristics micro-organisms organism flowering non-flowering

Plants

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge	<p>Identify and name a variety of common plants, including garden plants, wild plants and trees, and those classified as deciduous and evergreen</p> <p>Identify and describe the basic structure of a variety of common plants including roots, stem/trunk, leaves and flowers</p>	<p>Observe and describe how seeds and bulbs grow into mature plants</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>	<p>Identify and describe the functions of different parts of plants; roots, stem, leaves and flowers.</p> <p>Explore the requirements of plants for life and growth (air, light, water, nutrients from soil and room to grow) and how they vary from plant to plant.</p> <p>Investigate the ways in which water is transported within plants.</p> <p>Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal</p>			
Working Scientifically	<p>Observe closely, perhaps using magnifying glasses, and compare and contrast familiar plants</p> <p>Describe how they were able to identify and group them, and draw diagrams showing the parts of different plants including trees</p> <p>Keep records of how plants have changed over time, for example the leaves falling off trees and buds opening; and compare and contrast what they have found out about</p>	<p>Observing and recording, with some accuracy, the growth of a variety of plants as they change over time from a seed or bulb, or observing similar plants at different stages of growth set up a comparative test to show that plants need light and water to stay healthy</p>	<p>Compare the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser</p> <p>Discover how seeds are formed by observing the different stages of plant life cycles over a period of time</p> <p>Look for patterns in the structure of fruits that relate to how the seeds are dispersed</p> <p>Observe how water is transported in plants, for example, by putting cut, white carnations into coloured water and observing how water travels up the stem to the flowers</p>			
Vocabulary	<p>Deciduous</p> <p>Evergreen</p> <p>Blossom</p> <p>Petals</p> <p>Roots</p> <p>Bulb</p> <p>Stem</p> <p>Temperature</p> <p>Growth</p>	<p>nutrients</p> <p>reproduction</p> <p>transportation</p> <p>transpiration</p> <p>dispersal</p> <p>pollination</p>	<p>nutrients</p> <p>reproduction</p> <p>transportation</p> <p>transpiration</p> <p>dispersal</p> <p>pollination</p>			

Seasonal Changes

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge	<p>Observe changes across the four seasons</p> <p>Observe and describe weather associated with the seasons and how day length varies</p>					
Working Scientifically	<p>Make tables and charts about the weather; and make displays of what happens in the world around them, including day length, as the seasons change</p>					
Vocabulary	<p>Seasons</p> <p>weather</p> <p>Summer</p> <p>Spring</p> <p>Autumn</p> <p>Winter</p>					

		Materials		Rocks	States of Matter		
		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge	<p>Distinguish between an object and the material from which it is made</p> <p>Identify and name a variety of everyday materials including wood plastic glass water and rock</p> <p>Describe the simple physical properties of a variety of everyday materials</p> <p>Compare and group together a variety of everyday materials on the basis of their physical properties</p>	<p>Identify and compare the suitability of a variety of everyday materials including wood metal plastic glass brick rock paper and cardboard for particular uses</p> <p>Find out how the shapes of solid objects made from some materials can be changed by squashing bending twisting and stretching</p>	<p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties</p> <p>Describe in simple terms how fossils are formed when things that have lived are trapped within rock</p> <p>Recognise that soils are made from rocks and organic matter.</p>	<p>Compare and group materials together according to whether they are solids liquids or gases</p> <p>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)</p> <p>Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.</p>	<p>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</p> <p>Understand that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution</p> <p>Use knowledge of solids liquids and gases to decide how mixtures might be separated including through filtering sieving and evaporating</p> <p>Give reasons based on evidence from comparative and fair tests for the particular uses of everyday materials including metals wood and plastic</p> <p>Demonstrate that dissolving mixing and changes of state are reversible changes</p> <p>Explain that some changes result in the formation of new materials and that this kind of change is not usually reversible including changes associated with burning and the action of acid on bicarbonate of soda</p>		

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Working Scientifically	<p>Performing simple tests to explore questions, for example: 'What is the best material for an umbrella? ...for lining a dog basket? ...for curtains? ...for a bookshelf? ...for a gymnast's leotard?'</p>	<p>Comparing the uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits, and in stories, rhymes and songs)</p> <p>Observe closely, identifying and classifying the uses of different materials, and recording their observations.</p>	<p>Observe rocks, including those used in buildings and gravestones, and explore how and why they might have changed over time</p> <p>Use a hand lens or microscope to help them to identify and classify rocks according to whether they have grains or crystals, and whether they have fossils in them</p> <p>Research and discuss the different kinds of living things whose fossils are found in sedimentary rock and explore how fossils are formed</p> <p>Explore different soils, identify similarities and differences between them and investigate what happens when rocks are rubbed together or what changes occur when they are in water</p> <p>Raise and answer questions about the way soils are formed</p>	<p>Grouping and classifying a variety of different materials</p> <p>Exploring the effect of temperature on substances such as chocolate, butter, cream (for example, to make food such as chocolate crispy cakes and ice-cream for a party)</p> <p>Research the temperature at which materials change state, for example, when iron melts or when oxygen condenses into a liquid.</p> <p>Observe and record evaporation over a period of time, for example, a puddle in the playground or washing on a line, and investigate the effect of temperature on washing drying or snowmen melting</p>	<p>Carrying out tests to answer questions, for example, 'Which materials would be the most effective for making a warm jacket, for wrapping ice cream to stop it melting, or for making blackout curtains?'</p> <p>Compare materials in order to make a switch in a circuit -observe and compare the changes that take place, for example, when burning different materials or baking bread or cakes</p> <p>Research and discuss how chemical changes have an impact on our lives, for example, cooking, and discuss the creative use of new materials such as polymers, super-sticky and super-thin materials</p>	
Vocabulary	<p>Rough</p> <p>Smooth</p> <p>Stretchy</p> <p>Stiff</p> <p>Bending</p> <p>Twisting</p> <p>Stretching</p> <p>Elastic</p> <p>Foil</p> <p>Dull</p> <p>Waterproof</p> <p>Absorbent Fabrics</p>	<p>Rough</p> <p>Smooth</p> <p>Stretchy</p> <p>Stiff</p> <p>Bending</p> <p>Twisting</p> <p>Stretching</p> <p>Elastic</p> <p>Foil</p> <p>Dull</p> <p>Waterproof</p> <p>Absorbent Fabrics</p>	<p>Fossils Sandstone Granite Marble Rock Pumice Crystals Absorbent Sedimentary Organic matter Grains Solid Liquid Gas Evaporation Condensation Particles Freezing solidify changing state degree s Celsius water cycle water vapour</p>	<p>Fossils Sandstone Granite Marble Rock Pumice Crystals Absorbent Sedimentary Organic matter Grains Solid Liquid Gas Evaporation Condensation Particles Freezing solidify changing state degree s Celsius water cycle water vapour</p>	<p>properties solubility transparency electrical - conductor thermal conductor magnets dissolve solution separate separating reversible changes dissolving evaporation filtering sieving melting irreversible new material quantitative measurements conductivity insulation chemical</p>	

Forces and Magnets

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge			<p>Compare how things move on different surfaces</p> <p>Notice that some forces need contact between two objects but magnetic forces can act at a distance</p> <p>Observe how magnets attract or repel each other and attract some materials and not others</p> <p>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</p> <p>Describe magnets as having two poles</p> <p>Predict whether two magnets will attract or repel each other depending on which poles are facing</p>		<p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object</p> <p>Identify the effects of air resistance water resistance and friction that act between moving surfaces</p> <p>Recognise that some mechanisms including levers pulleys and gears allow a smaller force to have a greater effect.</p>	
Working Scientifically			<p>Compare how different things move and group them</p> <p>Raise questions and carry out tests to find out how far things move on different surfaces and gathering and recording data to find answers their questions</p> <p>Explore the strengths of different magnets and find a fair way to compare them</p> <p>Sort materials into those that are magnetic and those that are not;</p> <p>Look for patterns in the way that magnets behave in relation to each other and what might affect this, for example, the strength of the magnet or which pole faces another</p> <p>Identify how these properties make magnets useful in everyday items and suggesting creative uses for different magnets.</p>		<p>Explore falling paper cones or cup -cake cases, and design and make a variety of parachutes and carry out fair tests to determine which designs are the most effective</p> <p>Explore resistance in water by making and testing boats of different shapes design and make products that use levers, pulleys, gears and/or springs and explore their effects.</p>	
Vocabulary			<p>Magnetic Force Attract Repel Friction Poles Magnetic Poles</p>		<p>Gravity air resistance water resistance friction, surface force, effect Accelerate, decelerate mechanism ,pulley Gear, spring theory of gravitation Galileo ,Galilei Isaac Newton</p>	

Earth and Space

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge					<p>Describe the movement of the Earth and other planets relative to the Sun in the solar system</p> <p>Describe the movement of the Moon relative to the Earth</p> <p>Describe the Sun Earth and Moon as approximately spherical bodies</p> <p>Use the idea of the Earth's rotation to explain day and night and the apparent movement of the Sun across the sky</p>	
Working Scientifically					<p>Compare the time of day at different places on the Earth through internet links and direct communication</p> <p>creating simple models of the solar system</p> <p>Construct simple shadow clocks and sundials, calibrated to show midday and the start and end of the school day - find out why some people think that structures such as Stonehenge might have been used as astronomical clocks.</p>	
Vocabulary				<p>Earth</p> <p>Sun</p> <p>Moon</p> <p>Orbit</p> <p>Axis</p> <p>Rotation</p> <p>Spherical</p> <p>Day</p>	<p>Night</p> <p>Hemisphere</p> <p>Season</p> <p>Tilt</p> <p>Phases of the Moon</p> <p>star constellation</p> <p>Solar system</p>	<p>Mercury</p> <p>Venus</p> <p>Mars</p> <p>Jupiter</p> <p>Saturn</p> <p>Uranus</p> <p>Neptune</p> <p>Pluto</p>

Light

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge			<p>Recognise that they need light in order to see things and that dark is the absence of light</p> <p>Notice that light is reflected from surfaces</p> <p>Recognise that light from the sun can be dangerous and that there are ways to protect their eyes</p> <p>Recognise that shadows are formed when the light from a light source is blocked by a solid object</p> <p>Find patterns in the way that the sizes of shadows change.</p>			<p>Recognise that light appears to travel in straight lines</p> <p>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</p> <p>Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes</p> <p>Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them</p>
Working Scientifically			<p>-looking for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.</p>			<p>Decide where to place rear-view mirrors on cars; design and making a periscope and use the idea that light appears to travel in straight lines to explain how it works.</p> <p>Investigate the relationship between light sources, objects and shadows by using shadow puppets</p> <p>Extend their experience of light by looking a range of phenomena including rainbows, colours on soap bubbles, objects looking bent in water and coloured filters (they do not need to explain why these phenomena occur).</p>
Vocabulary			<p>Reflective Reflection Natural Artificial</p>			<p>Refraction Reflection Spectrum Rainbow travels straight reflect light source object shadows mirrors periscope filters</p>

Sound

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge				<p>Identify how sounds are made associating some of them with something vibrating</p> <p>Recognise that vibrations from a sound travel through a medium to the ear.</p> <p>Find patterns between the pitch of a sound and features of the object that produced it</p> <p>Find patterns between the volume of a sound and the strength of the vibrations that produced it.</p> <p>Recognise that sounds get fainter as the distance from the sound source increases</p>		
Working Scientifically				<p>Finding patterns in the sounds that are made by different objects such as saucepan lids of different sizes or elastic bands of different thicknesses</p> <p>Make earmuffs from a variety of different materials to investigate which provides the best insulation against sound make and play their own instruments by using what they have found out about pitch and volume</p>		
Vocabulary				<p>Vibration</p> <p>Wave</p> <p>Pitch</p> <p>Tone</p> <p>Percussion</p> <p>Wood wind</p> <p>Brass</p> <p>Insulate</p>		

Electricity

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge				<p>Identify common appliances that run on electricity</p> <p>Construct a simple series electrical circuit identifying and naming its basic parts including cells wires bulbs switches and buzzers</p> <p>Identify whether or not a lamp will light in a simple series circuit based on whether or not the lamp is part of a complete loop with a battery</p> <p>Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit</p> <p>Recognise some common conductors and insulators and associate metals with being good conductors.</p>		<p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit</p> <p>Compare and give reasons for variations in how function including the brightness of bulbs the loudness of buzzers and the on/off position of switches</p> <p>Use recognised symbols when representing a simple circuit in a diagram.</p>
Working Scientifically				<p>Observing patterns, for example, that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, and that some materials can and some cannot be used to connect across a gap in a circuit</p>		<p>Systematically identify the effect of changing one component at a time in a circuit; designing and making a set of traffic lights, a burglar alarm or some other useful circuit.</p>
Vocabulary				<p>Cells</p> <p>Switches</p> <p>Buzzers</p> <p>Motor</p> <p>Circuit</p> <p>Series</p> <p>Conductors</p> <p>Insulators</p> <p>complete circuit</p>		<p>Amps</p> <p>Volts</p> <p>Voltage</p> <p>Cell</p> <p>Circuit</p> <p>Diagram</p> <p>Symbols</p>

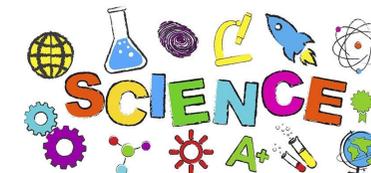
Evolution and Inheritance

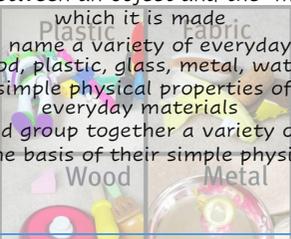
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Knowledge						<p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago.</p> <p>Recognise that living things produce offspring of the same kind but normally offspring vary and are not identical to their parents</p> <p>Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution</p>
Working Scientifically						<p>Observe and raising questions about local animals and ow they are adapted to their environment</p> <p>Compare how some living things are adapted to survive in extreme conditions, for example, cactuses, penguins and camels</p> <p>Analyse the advantages and disadvantages of specific adaptations, such as being on two feet rather than four, having a long or a short beak, having gills or lungs, tendrils on climbing plants, brightly coloured and scented flowers</p>
Vocabulary						<p>Evolution, adaption, inherited traits, adaptive traits, natural selection, inheritance , Charles Darwin, Alfred Wallace, DNA, variation, offspring, fossil</p>



Brockton C.E. Primary School

2 Year Rolling Program - Science

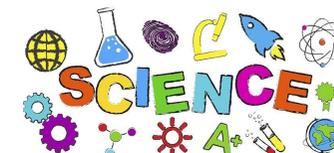


		KS1	Autumn	Spring	Summer	
		Knowledge Progression	<p>Light and Dark The Weather</p> <p>observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies.</p> <p>The children will study different types of weather through making and using a weather station and looking at the weather around the World. They study different aspects of the weather and learn how different weather is associated with different seasons. They give different weather forecasts for different times of the year.</p>	<p>Hot and Cold</p> <p>Linked to geography unit</p> <p>How camels and penguins live in habitats to which they are suited and describe how different habitats provide for the basic needs of different animals.</p>	<p>Plants</p> <p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees. Observe the growth of bulbs and/or seeds.</p> 	
Year A	Topic	<p>Our Environment</p> <p>Know how to respect and handle living things in their environment. Use their own observations to describe the changes that take place in vegetation and animal life across the year. Use everyday terms to describe simple features living things or events they observe. Present evidence they have collected in simple templates.</p>  <p>This unit is taught across the whole year with a minimum of two lessons in each term. The children will make observations about each season. The children will study the same natural area during the course of a year, looking at how the area as a whole changes and at how individual aspects such as a single tree change during the different seasons. They use their senses to observe the area and find common animals and plants within the area. They learn how to show respect for the area and for the living things in it</p>			<p>Going Green</p> <p>The pupils will learn the names of some common native flowering plants and trees. They will plant bulbs or seeds and observe their growth over a period of weeks. They will go outside to study plants and trees in wild and cultivated areas, making sketches and notes.</p>	
		KS1	<p>Animals Including Humans</p> <p>Identify and name a variety of common British animals that are birds, fish, amphibians, reptiles, mammals and invertebrates. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals. Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>	<p>Everyday Materials</p> <p>Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock Describe the simple physical properties of a variety of everyday materials Compare and group together a variety of everyday materials on the basis of their simple physical properties</p> 	<p>Habitats</p> <p>Identify and name a variety of plants and animals in their habitats, including micro-habitats 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. Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</p>	
Year B	Topic	<p>Amazing Me!</p> <p>Pupils will describe the external parts of the human body and learn the basic needs of human beings. They will look at a range of familiar and unfamiliar British animals and establish some ideas about what constitutes an animal. They will learn that animals belong to one of six main groups: birds, fish, amphibians, reptiles, mammals and invertebrates. And that each class has different characteristics and sometimes different body parts. They learn the names of some common British animals and research one animal in more detail.</p>			<p>Transport and Toys</p> <p>Pupils develop vocabulary to describe material properties. They carry out a range of simple tests on materials and investigate the best material to make a particular object.</p>	<p>Splash!</p> <p>Pupils spend time learning about familiar and unfamiliar habitats such as woodland and the sea-shore. They work in the classroom and outdoors to look at animals and plants and further their knowledge of the variety of life in different places and they go pond dipping. They extend their knowledge of the diets of different animals to understand about food chains.</p>
		KS1	<p>Animals Including Humans</p> <p>Identify and name a variety of common British animals that are birds, fish, amphibians, reptiles, mammals and invertebrates. Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals. Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p>	<p>Everyday Materials</p> <p>Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock Describe the simple physical properties of a variety of everyday materials Compare and group together a variety of everyday materials on the basis of their simple physical properties</p>	<p>Habitats</p> <p>Identify and name a variety of plants and animals in their habitats, including micro-habitats 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. Identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other</p>	



Brockton C.E. Primary School

2 Year Rolling Program - Science



	KS1/LKS2	Autumn	Spring	Summer
	Knowledge Progression	<p>State the difference between light sources and other shiny objects and name a number of light sources including the sun. Recognise that they need light in order to see things and that dark is the absence of light. Notice that light is reflected from surfaces. Recognise that light from the sun can be dangerous and that there are ways to protect their eyes. Recognise that shadows are formed when the light from a light source is blocked by a solid object. Find patterns in the way that the size of shadows change.</p> <p>Working Scientifically Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions using straightforward scientific evidence to answer questions or to support their findings.</p>	<p>Compare how things move on different surfaces. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Observe how magnets attract or repel each other and attract some materials and not others. Compare and group together a variety of everyday materials on the basis of whether they are attracted to a magnet, and identify some magnetic materials. Describe magnets as having two poles. Predict whether two magnets will attract or repel each other, depending on which poles are facing.</p> <p>Working Scientifically Setting up simple practical enquiries, comparative and fair tests. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, bar charts, and tables. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Using results to draw simple conclusions and suggest improvements, new questions and predictions for setting up further tests.</p>	<p>Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat. Identify that humans and some animals have skeletons and muscles for support, protection and movement.</p> <p>Working Scientifically Asking relevant questions and using different types of scientific enquiries to answer them. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings.</p>
Year A	Topic	<p>Innovation and Invention - Light</p> <p>Pupils learn to distinguish a light source from reflected light. They learn that light travels in straight lines, study how we see and are taught how to protect their eyes. They investigate the transparency of fabrics using data loggers and carry out some experiments to find out about shadow formation.</p>	<p>Egypt - Magnets</p> <p>Pupils explore magnetism and non-contact forces, suspending magnetic items in mid-air under the influence of magnetic forces. They test materials for magnetic properties and think about what materials are magnetic. They describe the properties of a magnet in simple terms and learn about the uses of magnets.</p>	<p>Africa - Animals and Skeletons/ Living Things - Years 2 and 3 units</p> <p>Pupils classify things as living, once alive and never alive. They learn about the characteristics of living things and building and observing a wormery and going outside to hunt for examples of living and non-living things. They look for characteristic of life in plants and establish that plants are living things. Pupils revisit the classification of animals according to diet as carnivores, herbivores or omnivores, researching the diets of animals in more detail. They look at human dietary requirements and begin to identify different food types and their different uses in the body. Dissecting an owl pellet provides a link between learning about diets and the study of skeletons. Pupils learn about external and internal skeletons, making a life size skeleton diagram and studying the names and functions of the major bones in the human skeleton.</p>
	KS1/LKS2	Autumn	Spring	Summer
	Knowledge Progression	<p>Compare and group together different kinds of rocks on the basis of their appearance and simple physical properties. Describe in simple terms how fossils are formed when things that have lived are trapped within rock. Recognise that soils are made from rocks and organic matter.</p> <p>Working Scientifically Asking relevant questions and using different types of scientific enquiries to answer them. setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations. Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions, recording findings. Using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings.</p>	<p>Chocolate - Animals and their needs</p> <p>Animals grow from juveniles into mature adults. Mammals give birth to live young but other animals lay eggs. Many immature animals including humans need care in order to mature but others grow up independent of their parents. A good diet, hygiene and exercise are important for maintaining good health.</p> <p>In this unit pupils begin by learning about the stages of human growth. They learn that animals grow until they are adult and that that different animals start life in different forms, some as eggs and some as live births and they look at the needs of the young of different species. Throughout the unit they observe some animals as they grow, both in the classroom, and through webcams on the Internet</p>	<p>Identify and describe the functions of different parts of flowering plants: roots, stem, leaves and flowers. Explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and how they vary from plant to plant. Investigate the way in which water is transported within plants. Explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal.</p> <p>Working Scientifically Setting up simple practical enquiries, comparative and fair tests. Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables. Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions. Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions using straightforward scientific evidence to answer questions or to support their findings.</p>
Year B	Topic	<p>Stone Age to Iron Age - Materials - Rocks - Years 2 and 3 units</p> <p>Pupils explore different materials and begin to link properties with the use of the material, carrying out an investigation to decide on the best material for a particular use and imagining what objects would be like if they were made from "silly" materials. They learn about the life of John Boyd Dunlop who invented the pneumatic tyre.</p> <p>Pupils explore the characteristics of rocks and learn their names. They carry out simple tests on different rocks and use chocolate to model how rocks are made. They explore the composition of soil and think about how soil is made. They learn about the formation of fossils and make their own model fossils. They look at pictures of dinosaur fossils and try to come to some conclusions about the living dinosaurs the fossils came from.</p>	<p>Chocolate - Animal Homes</p> <p>Observe closely and identify animal homes. Suggest suitable sites for animal homes, providing simple explanations for their choices using simple scientific vocabulary. Provide homes and other methods to attract animals.</p> <p>This unit is intended to be taught across the whole year with a minimum of two lessons in each term. Suggested core activities are intended to be carried out each term at least once. Pupils look at the "homes" that insects and birds need and make the school friendlier towards these creatures. They evaluate the success of the measures they have taken. Pupils also observe plants over time to explore the development of seeds and the life cycle of plants.</p>	<p>Romans - Plants - Years 2 and 3 units</p> <p>Pupils carry out a long-term investigation of the factors that affect the growth of plants, observing and measuring their plants for the course of the unit. They learn about the main functions of the different parts of a plant and will study the life cycle of a flowering plant, including studying the structure of a flower and the different methods of seed dispersal.</p>



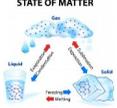
	UKS2	Autumn	Spring	Summer
	Knowledge Progression	<p>Light</p> <p>Recognise that light appears to travel in straight lines. Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye. Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes. Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them and to predict the size of shadows when the position of the light source changes.</p> <p>Electricity</p> <p>Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. Use recognised symbols when representing a simple circuit in a diagram.</p>	<p>Mixtures and Reactions</p> <p>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. Know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution. Use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. Give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic. Demonstrate that dissolving, mixing and changes of state are reversible changes. Explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.</p>	<p>Heart and Lungs</p> <p>Identify and name the main parts of the human circulatory system, and explain the functions of the heart, blood vessels and blood. recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function describe the ways in which nutrients and water are transported within animals, including humans.</p> <p>Classification</p> <p>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. Give reasons for classifying plants and animals based on specific characteristics.</p>
Year A	Topic	<p>World War II</p> <p>Can you investigate at what angle the lights need to be in order to give a specific height when the light beams meet? The children will need to use models of the approximate scale of the planes (a piece of card will suffice) and torches set a specific angle to then try to recreate the beams. They could then lower the 'plane' until the two beams touch, then this will allow them to create a table showing the angle of the beam compared to the height of the plane which the Dambusters used in order to create the ideal height at which to release the bouncing bombs.</p> <p>The Second World War showed an increased reliance on the use of electricity from creating circuits to power search lights, sending signals to set off air raid sirens and sending messages to different positions on the fighting line. As part of the messaging system the Army and Navy etc used the Morse code. Challenge the children to make their own electrical circuit which recreates a Morse code system, possibly even with a different switch for the longer and shorter light flashes.</p>	<p>The Greeks</p> <p>The children will study dissolving and learn how to recover materials from a solution. They look at other methods of separating mixtures and carry out an investigation on 'sewage' to clean it up before discharge into a river. They investigate chemical reactions including burning and use a key and a series of simple tests to identify some mystery powders. They will learn about reversible and irreversible changes.</p>	<p>Rivers</p> <p>Pupils study the circulatory system, learning about the basic components that make up blood, how the heart works and how blood circulates round the body. They learn about the lungs and the process of breathing and investigate the effect of exercise on the heart and breathing rates. They learn about the effects of smoking and alcohol.</p> <p>Pupils build on their knowledge of classification from previous years and look at the classification of invertebrates and microorganisms in more detail and playing games to help them learn about microorganisms and classes of invertebrates.</p>
	UKS2	Autumn	Spring	Summer
	Knowledge Progression	<p>Evolution</p> <p>Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. Recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. Identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.</p> <p>Decay and Recycling</p> <p>Describe the process of decay and its usefulness. Identify materials that will decay. Plan a scientific enquiry to find decay times of common materials, recognising and controlling variables. Record findings and estimate degree of trust in results. From investigation, estimate the time needed for some common materials from litter to decay. Know that some materials can be recycled into useful new materials.</p>	<p>Forces</p> <p>Explain unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object. Identify the effects of air resistance, water resistance and friction, that act that between moving surfaces. Recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect.</p> <p>Earth and Space</p> <p>Describe the movement of the Earth, and other planets, relative 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 apparent movement of the sun across the sky.</p>	<p>Life Cycles</p> <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird. Describe the life process of reproduction in some plants and animals.</p> <p>Field Studies</p> <p>Pupils use sampling techniques to support their studies of living things, using quadrats, sweep nets and other common field studies methods of finding out about animal and plant populations. They compare populations in different areas and discuss the effectiveness of the different techniques they have used.</p>
Year B	Topic	<p>The Tudors</p> <p>Pupils learn about the life and work of Charles Darwin and what is meant by the terms evolution and survival of the fittest. They learn how animals and plants are adapted to their environment. They investigate camouflage and find out how humans evolved. They carry out a simple experiment to model evolution and selective breeding.</p> <p>This unit is intended to be taught across the whole year with at least two lessons in each term. Pupils will carry out a number of visits in and around the school to look for evidence of decay. They will create a compost heap and observe it over time. Natural and man-made materials will be left in different places to see how well they break down. Pupils will also carry out a litter survey in the local area and</p>	<p>Anglo Saxons and the Vikings</p> <p>Pupils learn more about the forces of gravity and friction and investigate the friction of different surfaces. They study air resistance, investigate paper spinners falling, look at floating and sinking and build a self-righting boat. Learning about simple forces includes activities to study pulleys, gears and other simple machines and gives pupils the chance to use their knowledge of machines to build a catapult. Pupils study our solar system, learning about the relative movements of the planets and the Moon and relating these to the way we experience the Sun and the Moon on Earth. They carry out some research into planets and investigate the way meteorites have shaped the surface of the Moon.</p>	<p>The British Empire</p> <p>Pupils revisit the life cycle of plants, and learn about pollination. They compare the life cycles of birds, mammals, insects and amphibians and learn that insects and amphibians undergo metamorphosis.</p> <p>Use and evaluate some sampling techniques for environmental field work. Compare populations of living things. Provide reasons for the changes in population.</p>



Brockton C.E. Primary School

2 Year Rolling Program - Science



	UKS2	Autumn	Spring	Summer
	Knowledge Progression	<p>Sound Sound is created through vibration Sound varies in pitch and volume (loudness) The ear detects sound</p>	<p>Digestion Animals including humans need to digest (break down) food into chemicals that can be used by the body. This process is carried out by the digestive system Plants make their food using sunlight as an energy source, and all other food is dependent on this</p> <p>States of Matter Materials can be classified as belonging to one of three states of matter: solid, liquid or gas Each state of matter has specific properties Many materials can change state between solid, liquid</p>	<p>Respecting Our Environment That humans have an impact on the environment and that this can sometimes be positive or negative for the flora and fauna in the area That there are moral aspects to the way we treat our environment</p> <p>Classification That the wide variety of living organisms can be sorted into classes that have certain characteristics in common That there is a hierarchy for sorting organisms</p>
Year c	Topic	<p>China - The Shang Dynasty</p> <p>Pupils listen to and identify sounds and learn how our ears work to detect sounds. They carry out experiments to help them learn about loudness and pitch and use data loggers to investigate the best material for muffling sound. They make and play musical instruments.</p> 	<p>STATE OF MATTER</p>  <p>The British Empire</p>  <p>In this unit pupils learn about the structure of the mouth and about how to care for their teeth, investigating which drink stains teeth the most. They learn about the structure of the digestive system, build a model of the digestive process and make "poo", using their new knowledge to produce a piece of creative writing. They explore interrelationships in food, constructing food chains and food webs.</p> <p>Pupils learn that materials come in three states of matter: solid, liquid or gas. They identify materials as solids, liquids or gases, including some that are harder to classify such as sand or sponge. They learn how to use a thermometer and investigate changes of state. They learn about the water cycle.</p>	<p>National Parks</p> <p>Pupils look at the area within and near the school grounds and at the impact of humans on the environment. They discuss the need to balance human requirements against those of the environment.</p> <p>Pupils learn about the variety of living things and how they can be grouped according to shared characteristics. They use and construct keys to identify unfamiliar animals and plants</p> 