SCIENCE

SCIENCE AUTUMN 1					
YEAR 1	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
Units in red are to be revisited throughout the year at the beginning of each term and when identified as a focus					
Engaging Science Unit 1.5 Our Environment Pupils study the same natural area during the course of the 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. **Engaging Science Unit 1.3 Everyday Materials** In this unit the 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. **N.C. Everyday materials** Pupils should be taught to:	**Revisit Unit 2.1 Local Habitats** In this unit the pupils visit the same habitats and microhabitats at different times of year and explore the seasonal changes in a habitat and a micro-habitat. They continue to develop their observation skills **Engaging Science Unit 2.5 Materials** 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	**Engaging Science Unit 3.1 Animal Homes** This unit is intended to be taught across the whole year with a minimum of two lessons in each term. Ssuggested 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. **Engaging Science Unit 3.2 Animals and Skeletons** In this unit the 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	**Engaging Science Unit 4.1 Respecting our Environment** This unit is intended to be taught across the whole year with at least two lessons in each term. 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. **Engaging Science Unit 4.2 Classification** 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 **N.C. Living things and their habitats** Pupils should be taught to:	**Engaging Science Unit 5.1 Decaying and Recycling** 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. **Engaging Science Unit 5.6 Forces** 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	**Engaging Science Uni 6.1 Field Studies** In this unit 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 across the year. They compare populations in different areas and discuss the effectiveness of the different techniques they have used.

• 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	the life of John Boyd Dunlop who invented the pneumatic tyre. **N.C. Uses of everyday materials** Pupils should be taught to: • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	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. **N.C. Animals, including humans** Pupils should be taught to: • 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 other animals have skeletons and muscles for support, protection and movement	recognise that living things can be grouped in a variety of ways explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment recognise that environments can change and that this can sometimes pose dangers to living things	activities to study pulleys, gears and other simple machines and gives pupils the chance to use their knowledge of machines to build a catapult **N.C. Forces** Pupils should be taught to: • explain that 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 between moving surfaces • recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	

SCIENCE AUTUMN 2					
YEAR 1	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
Units in red are to be revisited throughout the year at the beginning of each term and when identified as a focus					
Our Environments -focus	**Engaging Science Unit 2.3 Animals and Their Needs** In this unit pupils begin by learning about the stages of human growth. They learn that animals grow until they are adult	**Engaging Science Unit 3.3 Forces and Magnets** In this unit the pupils explore magnetism and non-contact forces, suspending magnetic items in mid-air under the influence of	**Engaging Science Unit 4.3 Digestion** In this unit pupils learn about the structure of the mouth and about how to care for their teeth, investigating which drink stains teeth	**Engaging Science Unit 5.3 Earth and space** In this unit the pupils study our solar system, learning about the relative movements of the planets and the Moon and relating these	**Engaging Science Unit 6.2 Heart and Lungs** In this unit the 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

	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. This unit should be taught in late spring when it is possible to observe young birds and animals growing though online webcams. **N.C. statements – unit links to 2.6 Habitats and 2.3 Animals and Their Needs**	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. **N.C. Forces and magnets** Pupils should be taught to: • compare how things move on different surfaces • notice that some forces need contact between 2 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 2 poles • predict whether 2 magnets will attract or repel each other, depending on which poles are facing	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 **N.C. Animals, including humans** Pupils should be taught to: describe the simple functions of the basic parts of the digestive system in humans identify the different types of teeth in humans and their simple functions construct and interpret a variety of food chains, identifying producers, predators and prey	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 **N.C. Earth and space** Pupils should be taught to: • 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	on the heart and breathing rates. They learn about the effects of smoking and alcohol. **N.C. Animals including humans** Pupils should be taught to: • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • describe the ways in which nutrients and water are transported within animals, including humans

SCIENCE SPRING 1					
YEAR 1	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
Units in red are to be revisited throughout the year at the beginning of each term and when identified as a focus					
Seasonal Changes and Our Environment units to be revisited within the Spring Term **Engaging Science Unit** **1.5 Weather** **Seasonal changes aspect of this unit is to be revisited across the year** In this unit the pupils 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. **N.C. Seasonal Changes** Pupils should be taught to: • Observe changes across the four seasons. • Observe and describe weather associated with the seasons and how the day length varies.	**Revisit - Engaging Science Unit** **2.1 Local Habitats** **Engaging Science Unit** **2.6 Habitats** In this unit the 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. **N.C. Living things and their habitats** Pupils should be taught to: • explore and compare the differences between things that are living, dead, and things that have never been alive • 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	**Revisit - Engaging Science Unit 3.1 Animal Homes** **Engaging Science Unit** **3.4 Plants** In this unit the 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. **N.C. Plants** Pupils should be taught to: • identify and describe the functions of different parts of flowering plants: roots, stem/trunk, 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	**Revisit - Engaging Science Unit** **4.1 Respecting our Environment** **Engaging Science Unit** **4.4 Electricity** In this unit the pupils learn that some materials allow electricity through them and others do not. They learn about the history of electricity and they make and test electrical circuits with a variety of components. They use their knowledge of electricity to design and build a model of a burglar alarm for a house. **N.C. Electricity** Pupils should be taught to: • identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • 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	**Revisit - Engaging Science Unit** **5.1 Decaying and Recycling** **Engaging Science Unit 5.4 Mixtures and Reactions** After reviewing and extending their knowledge of materials from previous years, pupils 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 learn about reversible and irreversible changes and they create a drama about the life of a famous materials scientist. **N.C. Properties and changes of materials** Pupils should be taught to: • compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency,	**Engaging Science Unit** **6.3 Classification** In this unit the 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. They study yeast, observing its growth, using it to make bread N.C. Living things and their habitats Pupils should be taught to: • 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

	of animals and plants, and how they depend on each other • identify and name a variety of plants and animals in their habitats, including microhabitats • 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	• explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal	• recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • recognise some common conductors and insulators, and associate metals with being good conductors	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	

SCIENCE SPRING 2					
YEAR 1	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
Engaging Science Unit **1.4 Plants** In this unit pupils will learn the names of some common native flowering plants and trees. They plant bulbs and/or seeds and observe their growth over a period of weeks. They go outside to study flowers and trees in wild and cultivated areas, making sketches and notes. **N.C. Plants** Pupils should be taught to: • observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	**Engaging Science Unit** **2.4 Plants** In this unit the pupils think about the difference between seeds and other objects and work out what a seed is. They plant beans and monitor them weekly, observing, measuring, sketching and photographing them to provide a record of growth. They investigate the basic needs of plants for healthy growth and explore the way that plants change through the seasons. **N.C. Plants** Pupils should be taught to: • observe and describe how seeds and bulbs grow into mature plants • find out and describe how plants need water, light and a suitable temperature to grow and stay health	**Engaging Science Unit** **3.5 Light** In this unit the 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. **N.C. Light** Pupils should be taught to: • 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 an opaque object find patterns in the way that the size of shadows change	**Engaging Science Unit** **4.5 Sound** In this unit the 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. **N.C. Sound** Pupils should be taught to: • identify how sounds are made, associating some of them with something vibrating • recognise that vibrations from sounds travel through a medium to the ear • find patterns between the pitch of a sound and features of the object that produced it • find patterns between the volume of a sound and the strength of the vibrations that produced it • recognise that sounds get fainter as the distance from the sound source increases	**Engaging Science Unit** **5.5 Human Development** Pupils learn about the human life cycle and about the changes of the body during puberty. They learn about the development of a baby during pregnancy and about the birth of a baby. This unit has been written to match lessons in Personal, Social and Health Education on puberty and the feelings associated with growing up. **N.C. Animals, including humans** Pupils should be taught to: describe the changes as humans develop to old age	**Engaging Science Unit** **6.4 Electricity** In this unit pupils build on their learning from Year 4 to learn more about circuits, including how to use recognised symbols to represent circuits. They investigate how to change the amount of electricity flowing round a circuit, looking at how different components affect the flow of electricity and at the difference that the length and thickness of wires can make. They learn about series and parallel circuits and they use their knowledge of electricity to build games that use electric circuits. **N.C. Electricity** Pupils should be taught to: • 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

SCIENCE SUMMER 1					
YEAR 1	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
Units in red are to be revisited throughout the year at the beginning of each term and when identified as a focus					
Seasonal Changes and Our Environment unit work to be revisited within the Summer Term. **Engaging Science Unit** **1.2 The Animal Kingdom** In this unit pupils describe the external parts of the human body and learn the basic needs of human beings. They look at a range of familiar and unfamiliar British animals and establish some basic ideas about what constitutes an animal. They 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. N.C. Animals, including humans Pupils should be taught to: • notice that animals, including humans, have offspring which grow into adults • find out about and describe the basic needs of animals, including humans,	**Engaging Science Unit** **2.1 Local Habitats** **Engaging Science Unit** **2.2 Living Things.** In this unit the 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. **N.C. Animals, including humans** Pupils should be taught to: • notice that animals, including humans, have offspring which grow into adults • find out about and describe the basic needs of animals, including humans, for survival (water, food and air) describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	**Revisit - Engaging Science Unit 3.1 Animal Homes** **Engaging Science Unit** **3.6 Rocks** In this unit 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. **N.C. Rocks** Pupils should be taught to: • 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	**Revisit - Engaging Science Unit** **4.1 Respecting our Environment** **Engaging Science Unit** **4.6 States of Matter** In this unit 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. **N.C. States of matter** Pupils should be taught to: • compare and group materials together, according to whether they are solids, liquids or gases • 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) • identify the part played by evaporation and condensation in the water cycle and associate the rate	**Revisit - Engaging Science Unit** **5.1 Decaying and Recycling** **Engaging Science Unit** **5.2 Life Cycles** In this unit the 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. **N.C. Living things and their habitats** Pupils should be taught to: • 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	**Engaging Science Unit** **6.5 Light** In this unit pupils build on their work on light in Year 3 to make more detailed investigations of shadows. They use their conclusions from this work to create shadow puppets and use special effects in their puppet shows. They study reflectivity, build a periscope and investigate the effectiveness of sunglasses, learning about the dangers of UV light. **N.C. Light** Pupils should be taught to: • 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

for survival (water, food and air) • describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene			of evaporation with temperature		have the same shape as the objects that cast them

SCIENCE SUMMER 2					
YEAR 1	**YEAR 2**	**YEAR 3**	**YEAR 4**	**YEAR 5**	**YEAR 6**
Units in red are to be revisited throughout the year at the beginning of each term and when identified as a focus					
Our Environments Revisited throughout the year	**Local Habitats** Revisited throughout the year	**Animals and Homes** Revisited throughout the year	**Respecting our Environment** Revisited throughout the year	**Decaying and Recycling** Revisited throughout the year	**Engaging Science Unit** **6.6 Evolution** In this unit 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. **N.C. Evolution and inheritance** Pupils should be taught 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 • 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

WORKING SCIENTIFICALLY		
KEY STAGE 1	**LOWER KEY STAGE 2**	**UPPER KEY STAGE 2**
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: • 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 ides to suggest answers to questions. Gathering and recording data to help in answering questions.	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: • 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 or to support their findings.	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: • 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.