Science: Biology

	Pre 3	Nursery	Reception	**Year 1**	Year 2	Year 3	Year 4	Year 5	Year 6
Animals, including humans		I can understand the key features of the life cycle of a plant and an animal	I can explore the natural world around me, making observations and drawing pictures of animals and plants	I can identify, draw and label the basic parts of the human body and say which part of the body is to do with each sense. I can identify and name a variety of animals that are carnivores, herbivores and omnivores. I can spot and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. I can describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).	I can explain the needs of animals, including humans, for survival (water, food and air). I can explain the importance for humans of exercise, eating the right amounts of different types of food and hygiene. I notice that animals, including humans, have offspring which grow into adults.	I can 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. I can identify why humans and some other animals have skeletons and muscles.	I can describe the simple functions of the basic parts of the digestive system in humans. I can identify the different types of teeth in humans and their simple functions. I can construct and interpret a variety of food chains, identifying producers, predators and prey.	I can describe the changes as humans develop to old age.	I can identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood. I can recognise the impact of diet, drugs, exercise and lifestyle on the way our bodies function. I can describe the way in which nutrients and water are transported within animals, including humans.
Working Scientifically				I can use observations to compare and contrast animals at first hand or through videos and photographs. I can describe how I can identify and group animals. I can group animals according to what they eat.	I can observe, through video or first-hand observation and measurement, how different animals, including humans, grow. I can ask questions about what things animals need for survival and what humans need to stay healthy.	I can identify and group animals with and without skeletons and observing and comparing their movement. I can compare and contrast the diets of different animals (including pets) and decide ways of grouping them according to what they eat. I can research different food groups and how they keep us healthy and design meals based on what I find.	I can compare teeth in carnivores and herbivores and suggest the differences for them. I can find out what damages teeth and how to look after them. I can draw and discuss my ideas about the digestive system and compare them with models and images.	I can research and compare the gestation periods of different animals to humans.	I can research and explore the work of scientists and scientific research about the relationship between diet, exercise, drugs, lifestyle and health.
Living things and their habitats		I am beginning to understand the need to respect and care for the natural environment and all living things	I can explore the natural world around me. I can recognise some environments that are different to the one in which I live. I know some similarities and differences between the natural world around me and contrasting environments, drawing on my experiences and what has been read in class.		I can explain the differences between things that are living, dead and things that have never been alive. I can explain 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. I can identify some plants and animals in their		I can regonise that living things can be grouped in a variety of ways. I can explore and use classification keys to help group, identify and name a variety of living things in my local and wider environment. I can recognise that environments can change and that this can sometimes pose dangers to living things.	I can describe how some animals and plants reproduce. I can describe the differences in the life cycles of a mammal, amphibian, insect and a bird.	I can give reasons for classifying plants and animals based on specific characteristics. I can describe how plants, animals and microorganisms are classified into broad groups, according to common observable characteristics and based on similarities and differences.

					habitats, including microhabitats. I can 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.				
Working Scientifically					I can sort and classify things according to whether they are living, dead or were never alive and record my findings using charts. I can explore questions relating to living things eg is a flame alive? Is a deciduous tree dead in winter? I can construct a simple food chain that includes humans. I can describe the conditions in different habitats and find out how the conditions affect the number and type of plants and animals that live there.		I can make and use simple guides or keys to explore and identify local plants and animals. I can ask and answer questions based on my observations of animals and what I have found out about animals I have researched.	I can observe and compare the life cycles of plants and animals in my local environment with other plants and animals around the world. I can ask pertinent questions and suggest reasons for similarities and differences. I can experiment growing new plants from different parts of the parent plant eg seeds, stem, root cuttings, bulb. I can observe changes in an animal over a period of time, comparing how different animals reproduce and grow.	I can use classification systems and keys to identify some animals and plants in the immediate environment. I can research unfamiliar plants and animals from a broad range of other habitats and decide where they fit in the classification system.
Plants		I can plant seeds and care for growing plants I can understand the key features of the life cycle of a plant	I can explore the natural world around me, making observations and drawing pictures of animals and plants	I can name some common wild and garden plants including deciduous and evergreen trees. I can identify and describe the basic structure of a variety of common flowering plants including trees.	I can observe and describe how seeds and bulbs grow into plants. I can find out about and describe how plants need water, light and a suitable temperature to grow and stay healthy.	I can identify and describe functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers. I can 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. I can investigate the way that water is transported within plants. I can explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and see dispersal.			
Working Scientifically				Observe closely, perhaps using a magnifying glass, and comparing and contrasting familiar plants. Describe how I can identify and group plants.	I can observe and record, with some accuracy, the growth of a variety of plants as they change over time from seed to bulb. I can observe similar plants at different stages of growth.	I can compare the effect of different factors on plant growth, for example, the amount of light, the amount of fertiliser. I can observe how water is transported in plants by putting cut flowers into coloured water and			

				Draw diagrams showing the different plants including trees. I can keep records of how plants have changed over time eg leaves falling off trees and buds opening. I can compare and contrast what I have found out about different plants.	I can set up a comparative test to show that plants need light and water to stay healthy.	observing how water travels up the stem to the flowers.			
Evolution and Inheritance									I recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago. I recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents. I can identify how animals and plants are adapted to suit their environment in different ways and that adaption may lead to evolution.
Working Scientifically									I can observe and raise questions about how local animals are suited to their environment. I can compare how some living things are adapted to survive in extreme conditions. I can analyse the advantages and disadvantages of specific adaptations eg being on two feet instead of four, having a long or short neck etc.

Science: Chemistry

	Pre 3	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Uses of everyday materials/Properties and changes of materials	I can explore materials with different properties	I can explore collections of materials with similar and/or different properties I can talk about the differences between materials and changes I notice	I can understand some important processes and changes in the natural world around me, including the seasons and changing states of matter	I can tell the difference between an object and the material from which it is made. I can compare and group materials based on their simple physical properties. I can identify and name a variety of everyday materials including wood, plastic, glass, metal, water and rock. I can describe the physical properties of a variety of everyday materials.	Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. I can find out how shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.			I can compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity and response to magnets. I can explain that some materials will dissolve in liquid to form a solution and describe how to recover a substance from a solution. I can use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating. I can demonstrate that dissolving, mixing and changes of state are reversible changes. I can 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.	
Working Scientifically.	I can explore natural materials, indoors and outside	I can explore how things work I can use all my senses in hands-on exploration of natural materials		I can ask questions about the materials I work with. I can perform simple tests to explore questions	I can compare uses of everyday materials in and around the school with materials found in other places (at home, the journey to school, on visits in stories, rhymes and songs). I can observe closely, identifying and classifying the uses of different materials and record my observations.			I can carry out tests to answer questions such as 'Which materials would be most effective for making a warm jacket?' I can observe and compare changes that take place when burning different materials or baking bread or cakes. I can research and discuss how chemical changes have impact on our lives eg cooking, polymers.	
Rocks						I can examine and do practical experiments on various types of rocks in order to group them on the basis of their appearance and simple physical properties.			

						I can recognise that soils are made from rocks and organic matter. I can simply describe how fossils are formed and things that have lived are trapped within rock.			
Working Scientifically						I can observe different rocks (eg in buildings/gravestones) and explore how they might have changed over time. I can identify and classify rocks by whether they have crystals, grains or fossils in them, using a microscope. I can investigate what changes occur when rocks are rubbed together or when water is added to them. I can raise and ask questions about the way soils are formed.			
States of Matter			I can understand some important processes and changes in the natural world around me, including the seasons and changing states of matter				I can group and compare materials together according to whether they are solids, liquids or gases. I can observe and explain that some materials change state when they are heated or cooled and measure or research the temperature at which this happens in degrees Celsius. I can identify the part played by evaporation and condensation in the water cycle and can show the link between the rate of evaporation and temperature.		
Working Scientifically							I can explore the effect of temperature on substances such as chocolate, butter, cream etc. I can research at which temperature materials change state. I can observe and record evaporation over time.		

Science: Physics

	Pre 3	Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Seasonal changes	I can explore and respond to different natural phenomena in my setting and on trips		I can understand the effect of changing seasons on the natural world around me. I can understand some important processes and changes in the natural world around me, including the seasons and changing states of matter	I can observe changes through autumn, winter, spring and summer. I can observe and describe the weather in autumn, winter, spring and summer and how the days get longer and shorter.					
Working Scientifically			I can describe what I see, hear and feel whilst outside.	I can make tables and charts about the weather. I can make displays of what happens in the world around me, including day length, as the seasons change.					
Light						I can explain that I need light to see things and that dark is the absence of light. I can notice that light is reflected from surfaces. I can recognise that light from the sun can be dangerous and that there are ways to protect our eyes. I can recognise how shadows are formed when the light from a light source is blocked by a sold object. I find patterns in the way that the size of shadows change.			I can recognise that light appears to travel in straight lines. I can explain that light travels in straight lines and that objects seen because they give out or reflect light into our eye. I can demonstrate and explain that we see things because light travels through light sources to our eyes or from light sources to objects and then to our eyes. I can use the idea that light travels in straight lines to show why shadows are the same shape as the objects that cast them.
Working Scientifically						I can look for patterns in what happens to shadows when the light source moves or the distance between the light source and the object changes.			I can use my knowledge of light travelling in a straight line for a real-life purpose eg making a periscope, positioning a rear view mirror on a car. I can investigate the relationship between light sources, objects and shadows. I can extend my experience of light by looking at natural phenomena such as rainbows, objects looking bent in water, colours on soap bubbles.

Forces and Magnets		I can explore and talk about different forces I can feel I can understand some important processes and changes				I can see that some forces need contact between two objects, but magnetic forces can act at a distance. I can observe how magnets attract and repel each other and attract some materials and not others. I can compare and group some materials on the basis of whether they are attracted to a magnet and identify some magnetic materials. I can describe magnets as having two poles. I can predict whether two magnets will attract or repel each other depending on which poles are facing. I can compare how things move on different surfaces.		I can recognise that some mechanisms, including levers, pulleys and gears allow a smaller force to have a greater effect. I can identify the effects of air resistance, water resistance and friction that act between moving surfaces. I can explain that unsupported objects fall towards the earth because of the force of gravity acting between the earth and the falling object.	
Working Scientifically						I can compare how different things move and group them. I can raise questions and carry out tests to find out how far things move on different surfaces. I can gather and record data to find answers to my questions. I can explore the strengths of different magnets and find a fair way to compare them. I can identify how the properties of magnets make them useful in everyday items and suggest creative uses for different magnets.		I can explore how different materials fall and make parachutes of different designs to carry out fair tests to see which are most effective. I can explore resistance in water eg making boats of different designs.	
Sound							I can identify how sounds are made and show that some of them are linked to vibrations. I can recognise that vibrations from sounds travel through a medium to the ear. I can find patterns between the pitch of a sound and features of the object that produce it.		

							I can find patterns between the volume of a sound and the strength of vibrations that produced it. I can recognise that sounds get fainter as the distance from the source increases.		
Working Scientifically							I can find patterns in the sounds that are made by different objects eg different sized saucepan lids or elastic bands of different thickness. I can investigate a variety of materials to investigate which provides the best insulation against sound.		
Electricity							I can construct and draw a simple series electrical circuit which includes cells, wires, bulbs, switches and buzzers. I can predict if a lamp will light or not in a simple series circuit based on whether or not the lamp is part of a complete loop with a battery. I can recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. I can identify common appliances that run on electricity. I can recognise some common materials are conductors and some are insulators and can explain that metals are conductors.		I can show that the brightness of a lamp or the volume of a buzzer depends on the number of voltage cells used in a circuit. I can 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. I can use recognised symbols to represent a simple circuit in a diagram.
Working Scientifically							I can observe patterns eg that bulbs get brighter if more cells are added, that metals tend to be conductors of electricity, that some materials can and can't conduct electricity across a gap in a circuit.		I can systematically identify the effect of changing one component in a circuit. I can use my knowledge of electricity for application in the real world eg make a set of traffic lights, a burglar alarm, or other useful circuit.
Earth and Space								I can describe the movement of the earth and other planets relative to the sun in the solar system.	

								I can describe the movement of the moon relative to the earth. I can describe the sun, earth and moon as approximately spherical bodies. I can explain day and night and the apparent movement of the sun across the sky using the idea of the earth's rotation.	
Working Scientifically								I can compare the time of day at different places on Earth. I can create a simple model of the solar system. I can create a simple shadow clock or sundial. I can research why some people think structures as Stonehenge were used as astronomical clocks.	