

Beaconsfield Annual Science Curriculum Overview.

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	
Year 1	Animals including Humans To identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals <ul style="list-style-type: none"> 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 (fish, amphibians, reptiles, birds and mammals, including pets) Identify, name, draw & label the basic parts of the human body and say which part is associated with each sense. (head, neck, arms, elbows, legs, knees, face, ears, eyes, hair, mouth, teeth) Use local environments to explore & answer questions about animals in their habits 		Everyday materials To distinguish between an object and the material from which it is made <ul style="list-style-type: none"> to identify and name a variety of everyday materials, including wood, plastic, glass, metal, water & rock describe the simple properties of a variety of everyday materials compare & group together a variety of everyday materials on the basis of simple physical properties. (hard/ soft, stretchy/ stiff, shiny/ dull, rough/ smooth, bendy/ not bendy, waterproof/ not waterproof, absorbent/ not absorbent, opaque/ transparent) 		Plants To identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. <ul style="list-style-type: none"> Identify and describe the basic structure of a variety of common flowering plants, including trees Plant structures including: leaves, flowers, blossom, petals, fruit, roots, bulb, seed, trunk, branches & stem 		
	Observe changes across the four seasons To observe and describe weather associated with the seasons and how day length varies Make tables, chart, posters about the weather in London, the UK and around the world		Observe changes across the four seasons To observe and describe weather associated with the seasons and how day length varies Make tables, chart, posters about the weather in London, the UK and around the world		Observe changes across the four seasons To observe and describe weather associated with the seasons and how day length varies Make tables, chart, posters about the weather in London, the UK and around the world		
Year 2	Uses of everyday materials Identify & compare the suitability of a variety of everyday materials including wood, plastic, glass, metal, brick, rock, paper & cardboard for particular uses. <ul style="list-style-type: none"> Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting & stretching. People such as John Dunlop, Charles Macintosh or John McAdam 	Animals including humans Notice that animals, including humans, have offspring which grow into adults <ul style="list-style-type: none"> Find out about and describe the basic needs of animals, including humans, for survival (water, food & air) Describe the importance for humans of exercise, eating the right amounts of different types of food and of hygiene. Identify some processes of reproduction & growth in animals (e.g. egg – chick – chicken – egg or caterpillar – pupa – butterfly etc) Growing into adults can include reference to: baby – toddler – child – teenager – adult – old age 		Plants <ul style="list-style-type: none"> Observe & describe how seeds and bulbs grow into mature plants. Find out & describe how plants need water, light & a suitable temperature to grow & stay healthy Requirements for 'germination', 'growth' & 'survival' Process of reproduction & growth in plants 		Living things and their habitats Explore & compare the differences between things that are living, dead and things that have never been alive <ul style="list-style-type: none"> Identify that most living things live in habitats to which they are suited & describe how different habitats provide for the basic needs of different kinds of animals & plants; and how they depend upon each other Identify & name a variety of plants & animals in their habitats, including micro-habitats Describe how animals obtain their food from plants & other animals, using a simple food chain, identify & name different sources of food 	
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Year 3	Animals, including humans <ul style="list-style-type: none"> 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 Explore groups of animals with and without skeletons Research different food groups; design meals based on this research 	Characteristics of materials <ul style="list-style-type: none"> to identify a range of common materials and that the same material is used to make different objects to recognise properties such as hardness, strength and flexibility and compare materials in terms of these properties that materials are suitable for making a particular object because of their properties and that some properties are more important than others when deciding what to use to obtain evidence to test scientific ideas & to plan & carry out a test safely to decide whether the test was fair to plan a test to compare the absorbency of different papers, deciding what evidence to collect, considering what to change, what to keep the same and what to measure to make comparisons and draw conclusions to plan how to find out which pair of tights is most stretchy, making a fair comparison to decide what to change, what to keep the same 	Forces and magnets <ul style="list-style-type: none"> 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 & attract some materials & not others Compare & group together a variety of everyday materials on the basis of whether they are attracted to a magnet; identify some magnetic materials Describe magnets as having two poles Predict whether two magnets attract or repel 	Rocks and Soils <ul style="list-style-type: none"> Compare and group together different kinds of rocks based on 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 Explore different kinds of rocks & soils (including in the local environment) Research & discuss 'sedimentary rocks' Use hand microscopes to help identify and classify rocks 	Plants <ul style="list-style-type: none"> To identify and describe the functions of different parts of flowering plant: roots, stem/trunk, leaves & flowers Explore the requirements of plants for life & growth (air, light, water, nutrients from soil; and room to grow) and how these 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 & seed dispersal Introduced to relationship between 'structure' & 'function' of parts of plant Introduced to ideas that plants make their own food 	Light <ul style="list-style-type: none"> Recognise that they need light in order to see things and that 'dark' is the absence of light Notice that light is reflected from surfaces Recognise that light from the sun can be dangerous and 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.
Year 4	Animals including humans <ul style="list-style-type: none"> Describe the simple functions of the basic parts of the digestive system in humans (mouth, tongue, teeth, oesophagus, stomach and small/ large intestine) Work scientifically to compare teeth of carnivores and herbivores; suggesting reasons for differences Identify what damages teeth and how to look after them 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. 	Moving & Growing / Skeletons <ul style="list-style-type: none"> that humans (and some other animals) have bony skeletons inside their bodies and to raise questions about different bony skeletons to make and record relevant observations of bones and skeletons that human skeletons are internal and grow as humans grow to identify a question and turn it into a form that can be tested to decide precisely what body measurement to make, and to make it to use bar charts or pictograms to present measurements to say what the evidence shows and whether it supports the prediction that the skeleton supports the body that animals with skeletons have muscles attached to the bones that a muscle has to contract (shorten) to make a bone move that muscles act in pairs that when someone is exercising or moving fast, the muscles work hard 	Sound <ul style="list-style-type: none"> 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 Explore & identify sound vibration through a range of musical instruments Construct ear muffs to insulate against sound from a variety of different materials Use IT to investigate and log changes in environmental sounds; construct graphs, charts and tables 	Electricity / Circuits & Conductors <ul style="list-style-type: none"> 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 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. Draw circuits as a pictorial representation Use terms such as 'current' & 'voltage' 	States of matter <ul style="list-style-type: none"> 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 of evaporation with temperature Observe 'water' as a solid, liquid & a gas and note the changes that take place Group and classify a variety of different materials; exploring effects of temperature on substances 	Living things & their habitats <ul style="list-style-type: none"> Recognise that living things can be grouped in a variety of ways explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment recognise that environments can change and that this can sometimes pose dangers to living things. Explore examples of human impact (positive & negative) on environments (e.g. nature reserves, ecologically planned parks, garden ponds and also effects of population increase/ development, litter or deforestation) Begin to group vertebrate animals into groups such as fish, amphibians, reptiles etc Begin to group plants into categories such as flowering , non-flowering, ferns & mosses

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Year 5	<p>Earth and Space (Visit Planetarium)</p> <ul style="list-style-type: none"> 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. Be introduced to models of the solar system and use these to explain 'day & night' Learn that the 'Sun' is a star at the centre of the solar system with 8 planets Understand that the moon is a celestial body that orbits a planet Investigate work of scientists such as Ptolemy, Alhazen and Copernicus Work scientifically to compare time of the day at different places on the Earth Construct simple models of the solar system, sun dials, shadow clocks etc Investigate structures such as 'Stonehenge' and why some believe it may have been an astronomical clock 	<p>Properties and changes of materials</p> <ul style="list-style-type: none"> 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 Explore reversible changes, including evaporating, filtering, sieving, melting and dissolving Explore changes difficult to reverse, such as burning, rusting and other reactions Investigate how 'chemists' create new materials e.g. Spencer Silver – who invented glue for sticky notes or Ruth Benerito – who invented wrinkle free cotton 	<p>Forces & Friction</p> <ul style="list-style-type: none"> 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. Explore the effects of 'air resistance' by observing different objects such as parachutes and sycamore seeds Experience forces that make things begin to move, get faster or slow down Investigate about scientists such as Galileo Galilei and Isaac Newton who helped to develop theories of gravitation Design and make products that use levers, pulleys and gears 	<p>Keeping Healthy</p> <ul style="list-style-type: none"> That to stay healthy we need an adequate and varied diet To present information about diet and health That we need exercise to stay healthy and to maintain our muscles That the heart & lungs are protected by the ribs That the muscle in the walls of the heart contracts regularly, pumping blood around the body That blood vessels carry blood around the body How to measure their pulse rate and relate it to heart beat To represent data about resting pulse rate in a bar chart and to say what this shows To identify factors which could affect pulse rate and make predictions about the changes To plan what evidence to collect including the number of measurements of pulse rate to take and the number of children to use To present results in a line graph and explain what these show and whether they support the prediction That when humans exercise, muscles move parts of the skeleton and this activity requires an increased blood supply, so the heart beat increases and the pulse rate is faster that substances like tobacco, alcohol and other drugs can affect the way the body functions and these effects can be harmful that medicines are also drugs and also affect the way the body functions but the effects are usually beneficial though there may be side effects 	<p>Animals including Humans</p> <ul style="list-style-type: none"> Describe the changes as humans develop to old age. Pupils should draw a timeline to indicate stages in the growth and development of humans. They should learn about the body changes experienced in puberty. Pupils could work scientifically by researching the gestation periods of other animals and comparing them with humans; by finding out and recording the length and mass of a baby as it grows. 	<p>Living things and their Habitats</p> <ul style="list-style-type: none"> 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 Observe life-cycle changes in a variety of living things e.g. plants in a vegetable garden/ flower box or animals in the local environment Find out about the life of naturalists and animal behaviourists e.g. David Attenborough & Jane Goodall Find out about different types of reproduction in plants and animals

Year	Autumn	Spring and Summer
Year 6	<p>Evolution and Inheritance</p> <ul style="list-style-type: none"> Recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago Recognise that living things produce offspring of the same kind, 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>Animals including Humans</p> <ul style="list-style-type: none"> Identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function Describe the ways in which nutrients and water are transported within animals, including humans. <p>Living things and their habitats</p> <ul style="list-style-type: none"> Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including micro-organisms, plants and animals Give reasons for classifying plants and animals based on specific characteristics. <p>Micro Organisms</p> <ul style="list-style-type: none"> That there are very small organisms called micro-organisms which can be harmful; that scientific ideas about diseases are based on evidence To consider the reasons for some common illnesses; that some micro-organisms can cause common illnesses That micro-organisms are often too small to be seen To make suggestions about observing food, bearing in mind the need for safety That micro-organisms can cause food to decay; that food needs to be handled and stored with care That micro-organisms bring about decay and that decay can be beneficial That micro-organisms which cause decay are living organisms; that micro-organisms feed and grow To make suggestions about what yeast needs to grow To make careful observations and compare these in order to draw conclusions about the effect of yeast on dough That micro-organisms are useful in food production <p>Interdependence and Adaptation</p> <ul style="list-style-type: none"> that green plants need light in order to grow well that green plants make new plant material using air that for this to take place the green plant requires leaves that fertilisers are often added to soils to provide plants with the nutrients they need to use keys to identify animals and plants in a local habitat that animals and plants in a local habitat are interdependent how animals and plants in a local habitat are suited to their environment that food chains can be used to represent feeding relationships in a habitat that food chains begin with a plant (the producer) that different plants grow in different soil conditions that water and nutrients are taken in through the root that roots anchor the plant in the soil that different animals and plants are found in different habitats how animals and plants in a second habitat are suited to their environment to construct food chains in a particular habitat 	<p>Electricity / Circuits</p> <ul style="list-style-type: none"> 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>Forces</p> <ul style="list-style-type: none"> that the Earth and objects are pulled towards each other; this gravitational attraction causes objects to have weight to use a forcemeter carefully, interpreting the scale correctly that weight is a force and is measured in newtons that several forces may act on one object to represent the direction of forces by arrows that when an object is submerged in water, the water provides an upward force (upthrust) on it to make careful measurements of force using a forcemeter that how much an elastic band stretches depends on the force acting on it to make careful measurements of length to represent data in a line graph and use this to identify patterns in the data to distinguish between a scientific explanation for results and descriptions or other statements to identify appropriate scientific explanations that air resistance slows moving objects that when an object falls, air resistance acts in the opposite direction to the weight to check measurements by repeating them to interpret a line graph and use it to describe the motion of spinners falling <p>Dissolving</p> <ul style="list-style-type: none"> that solids which do not dissolve in water can be separated by filtering which is similar to sieving to describe a scientific process in a series of sequenced steps to make predictions about which types of water contain dissolved materials and test these predictions that when solids dissolve a clear solution is formed (which may be coloured), the solid cannot be separated by filtering that when the liquid evaporates from a solution the solid is left behind to make predictions about what happens when water from a solution evaporates and to test these predictions to turn ideas about helping solids dissolve more quickly into a form that can be investigated and decide how to carry out a fair test to decide what apparatus to use and to make careful observations and measurements to make comparisons and draw conclusions to use a line graph to present results that several repeated measurements provide data that can be used with more confidence to draw a line graph from results <p>Light</p> <ul style="list-style-type: none"> 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.