Prince Albert PRIMARY SCHOOL

Science: Long Term Overview

Biology	
Physics	
Chemistry	
Non statutory content	

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
YEAR ONE	**Seasons -Summer** To name 4 seasons To know the features of weather in the summer To know what changes take place in autumn. To know how autumn affects the way people live	**Seasons – Autumn** To name 4 seasons To know the features of weather in the Autumn To know what changes take place in Autumn. To know how Autumn affects the way people live. To know that daylight hours are getting less	**Seasons – Winter** To know the features of weather in the winter To know what changes take place in winter. To know how winter affects the way people live. To know that daylight hours are the shortest in winter	**Seasons – Spring** To know the features of weather in the spring To know what changes take place in spring To know how spring affects the way people live. To know that daylight hours are the beginning to increase		**Seasons – Comparison** To know the features of weather in the Summer To know what changes take place in the summer. To know how the summer affects the way people live. To know that daylight hours are at their longest in the summer.
	Everyday Materials To distinguish between an object and the material from which it is made To identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock To describe the simple physical properties of a variety of everyday materials To compare and group together a variety of everyday materials on the basis of their simple physical properties		**Animals including humans** To identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals To identify and name a variety of common animals that are carnivores, herbivores and omnivores To describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) To identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense		**Plants** To identify and name a variety of common wild and garden plants, including deciduous and evergreen trees To identify and describe the basic structure of a variety of common flowering plants, including trees	**Electricity** To know which appliances, need electricity to work To sort items into those that need mains electricity and those that are battery operated and those that need both. To know how to stay safe when using electricity **Light** To name different light sources To identify natural and artificial light sources. To know that darkness is the absence of light

	Working Scientifically:	
	Asking simple questions and recognising that they can be answered in different ways	I can make contributions to discussions I can ask simple questions I can make a guess
	Observing closely, using simple equipment	With help, I can use simple equipment to collect data I can describe or respond appropriately to observations about: Simple features of objects, living things and events etc
	Performing simple tests	I can use simple equipment with support I can follow steps in a simple test

	Identifying and classifying		I can communicate my findings in simple ways I can make simple comparisons		
	Using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions		I can go back to questions that I have answered and, with support, discuss the results		
YEAR TWO	**Everyday materials** 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 To find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	**Living things and their habitat** To explore and compare the differences between things that are living, dead and things that have never been alive To 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 To identify and name a variety of plants and animals in their habitats, including microhabitats To 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	**Plants** To observe and describe how seeds and bulbs grow into mature plants To find out and describe how plants need water, light and a suitable temperature to grow and stay healthy	**Animals including humans** To notice that animals, including humans, have offspring which grow into adults To find out about and describe the basic needs of animals, including humans, for survival (water, food and air) To describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene	**Electricity** To recognise a simple series circuit involving batteries, wires, bulb and other components. To understand how a switch can be used to break a circuit.
	Working Scientifically:				
	Asking simple questions and recognising that they can be answered in different ways		I can respond to suggestions about how to find things out I can use simple texts, with help, to find out about scientific ideas With help, I can choose variables and explain fairness With help, I can raise questions With help, I can make suggestions about how to collect data to answer questions		
	Observing closely, using simple equipment		I can use simple equipment provided I can make observations related to the task I can agree or challenge observations described by my peers		
	Performing simple tests		I can use simple equipment with increasing independence I can follow steps in a simple test		
	Identifying and classifying		With help, I can record using simple tables, pictures and words I can make comparisons using scientific vocabulary I can interpret data from bar charts and tables I can make comparisons using scientific vocabulary		
	Using their observations and ideas to suggest answers to questions gathering and recording data to help in answering questions		I can say whether what happened was what I expected I can communicate what I have found out using simple sentences and annotated drawings I can recognise when things do not go to plan I can say whether what happened was what I expected		

YEAR THREE	**Rocks** To compare and group together different kinds of rocks on the basis of their appearance and simple physical properties To describe in simple terms how fossils are formed when things that have lived are trapped within rock To recognise that soils are made from rocks and organic matter ***Featured scientist:*** *Brianna Green Biogeochemist* 	**Forces and Magnets** To compare how things move on different surfaces To notice that some forces need contact between two objects, but magnetic forces can act at a distance To observe how magnets attract or repel each other and attract some materials and not others To 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 To describe magnets as having two poles To predict whether two Magnets will attract or repel each other, depending on which poles are facing ***Featured scientist:*** *Dr Anjana Khatwa Earth scientist* 	**Light - Part 1** To recognise that they need light in order to see things and that dark is the absence of light To notice that light is reflected from surfaces To recognise that light from the sun can be dangerous and that there are ways to protect their eyes ***Featured scientist:*** *Rafsan Chowdhury Mechanical Engineer* 	**Plants** To identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers To 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 To investigate the way in which water is transported within plants To explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal ***Featured scientist:*** *Dr Kelsey Byers Evolutionary Biologist* 	**Animals including humans** 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 To identify that humans and some other animals have skeletons and muscles for support, protection and movement ***Featured scientist:*** *Kelly Blacklock Veterinary Surgeon* 	**Light - Part 2- Shadows** To recognise that shadows are formed when the light from a light source is blocked by an opaque object To find patterns in the way that the size of shadows change ***Featured scientist:*** *Edward Thompson Software Engineer* 

Working Scientifically:	
Asking relevant questions and using different types of scientific enquiries to answer them	I can raise questions using my scientific knowledge I can say what I would like to find out
Setting up simple practical enquiries, comparative and fair tests	I can respond to suggestions about how to find the answer to a question I can use simple texts to find information with a partner With support, I can begin to carry out a fair test. I can make predictions
Making systematic and careful observations and , where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	With, support I can use simple equipment. In a group, I can begin to decide upon an appropriate approach. With support, I can measure quantities such as length, mass or temperature. I can make relevant observations
Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	I can communicate what I have found out orally I can record observations

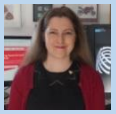
					I can record my measurements
	Recording findings using simple scientific language, drawings, labelled diagrams, keys, simple bar charts, and tables				I can record my findings using……
	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions				I can discuss my results in a group and think about what my prediction was I can discuss and present my findings in a presentation I can use scientific vocabulary
	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions				With support, I can identify simple patterns in recorded measurements
	Identifying differences, similarities or changes related to simple scientific ideas and processes				I can discuss what I have learnt
	Using straightforward scientific evidence to answer questions or to support their findings				I can explain answer questions based on my results
YEAR FOUR	**States of Matter** To compare and group materials together, according to whether they are solids, liquids or gases To 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) To identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature ***Featured scientist:*** *Anwar Khan* *Atmospheric Chemist* 	**Animals including humans** To describe the simple functions of the basic parts of the digestive system in humans To identify the different types of teeth in humans and their simple functions To construct and interpret a variety of food chains, identifying producers, predators and prey ***Featured scientist:*** *Dr Marie Goeppi* *Immunologist* 	**Electricity** To identify common appliances that run on electricity To construct a simple series electrical circuit identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers To identify whether or not a lamp will light in a simple series circuit, based on whether or no the lamp is part of a complete loop with a battery To recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit To recognise some common conductors and insulators and associate metals with being good conductors ***Featured scientist:*** *Daniel Azahan* Mechanical Engineer 	**Living things and their habitats** To recognise that living things can be grouped in a variety of ways To explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment To recognise that environments can change and that this can sometimes pose dangers to living things ***Featured scientist:*** *Prem Gill* *Polar Scientist* 	**Sound** To identify how sounds are made, associating some of them with something vibrating To recognise that vibrations from sounds travel through a medium to the ear To find patterns between the pitch of a sound and features of the object that produced it To find patterns between the volume of a sound and the strength of the vibrations that produced it To recognise that sounds get fainter as the distance from the sound source increases **Summer 1** ***Featured scientists:*** *Kathryn Waring* *Chartered Civil Engineer*  **Summer 2** ***Featured scientists:*** *Dr Alison Parker* *Water Scientist* 
	Working Scientifically:				
	Asking relevant questions and using different types of scientific enquiries to answer them				I can recognise why it is important to collect data to answer questions. I can raise questions

	Setting up simple practical enquiries, comparative and fair tests	I can respond to suggestions and put forward my own ideas about how to find the answer to a question I can use simple texts to find information I can give reasons to support ideas when asked to do so I can begin to carry out a fair test, recognising and explaining why it is fair I can make predictions with a reason based on personal experience
	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**	I can use a range of simple equipment I can begin to decide upon an appropriate approach I can measure quantities such as length, mass or temperature I can make relevant observations I can communicate and record in a scientific way what I have found out. I can record observations in a variety of ways I can record my measurements in an efficient way
	Recording findings using simple scientific language, drawings, labelled diagrams, keys, simple bar charts, and tables	I can record my findings using……
	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	I can identify simple cause and effect I can identify patterns in recorded measurements I can provide explanations for my observations
	Identifying differences, similarities or changes related to simple scientific ideas and processes	I can suggest improvements in my work
	Using straightforward scientific evidence to answer questions or to support their findings	I can explain my findings relating back to my original questions I can use scientific vocabulary

YEAR FIVE	**Properties and changing of materials** To 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 To know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating To give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic To demonstrate that dissolving, mixing and changes of state are reversible changes To explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible,	**Forces** To explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object To identify the effects of air resistance, water resistance and friction, that act between moving surfaces To recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect ***Featured scientist:*** *Tim Harrison Science Communicator* 	**Earth and Space** To describe the movement of the Earth and other planets relative to the sun in the solar system To describe the movement of the moon relative to the Earth To describe the sun, Earth and moon as approximately spherical bodies To use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky ***Featured scientist:*** *Dr Karen Alpin Space scientist* 	**Living things and their habitats** To describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird To describe the life process of reproduction in some plants and animals ***Featured scientist:*** *Yogesh Kumar Applications scientist* 	**Animals including humans** To describe the changes as humans develop to old age To recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function. ***Featured scientist:*** *Letizia Delle Vedova Molecular Biologist* 

	including changes associated with burning and the action of acid on bicarbonate of soda ***Autumn 1*** ***Featured scientist:*** *Dr Raquel Prado* *Renewable Materials Engineer*  ***Autumn 2*** ***Featured scientist:*** *Dr Kirsty Anderson* *Medicinal Chemist* 				

	Working Scientifically:	
	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	I can recognise that it is important to test ideas using evidence from observation and measurement I can begin to recognise that people may form opinions without considering evidence I can recognise that scientific ideas are based on evidence I can generate ideas that can be investigated scientifically and decide how to find answers I can plan a fair test and explain why it is fair With help, I can raise questions containing scientific knowledge and under-standing Where appropriate, I can make predictions based upon personal knowledge and understanding I can decide on an appropriate approach I can select suitable equipment and information from sources provided
	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	I can use equipment accurately, including: measuring cylinders, stop watches and thermometers. I can repeat readings accurately I can describe or show in the way I perform the task, how to vary one variable while keeping others the same
	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar graph	I can begin to plot points to form simple graphs I can communicate conclusions and patterns with appropriate scientific language I can re-order results to show a pattern I can use ICT to make some measurements With help, I can include repeat readings With help, I can make a series of observations and measurements adequate for the task I can record observations, comparisons and measurements using tables and bar charts I can choose a method to suit the results, e.g. a two-column table
	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 results, explanations of and degree of trust in results, in oral and written forms such as displays and other presentation**	I can reject a result based on a reason (where appropriate) I can make new predictions based on my results
	Identifying scientific evidence that has been used to support or refute ideas or argument	I can reject a result based on a reason I can suggest improvements to my work giving reasons

YEAR SIX	**Living things and their habitats** 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 To give reasons for classifying plants and animals based on specific characteristics ***Featured scientist:*** *Dawood Qureshi* *Marine Biologist* 	**Electricity** To associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit To 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 To use recognised symbols when representing a simple circuit in a diagram ***Featured scientist:*** *Emma Dunn* *Palaeobiologist* 	**Evolution and inheritance** 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 To recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents To identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution ***Featured scientist:*** *Telma Laurentro Evolution Biologist* 	**Light** To recognise that light appears to travel in straight lines To 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 To 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 To use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them ***Featured scientist:*** *Professor Colin Webb* *Laser Physicist* 	**Animals including humans** To identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood To recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function To describe the ways in which nutrients and water are transported within animals, including humans ***Featured scientist:*** *Michelle Williams* *Radiologist* 	**STEM Project** **To design and build a battery powered vehicle** To select the appropriate electrical components. To draw a circuit using the correct symbols in their design. To incorporate a switch into their design. ***Featured scientist:*** *Kelsey Archer Barnhill* *Deep Sea Ecologist* 

Working Scientifically:	
Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	I can select from a range of sources of information when trying to answer a scientific question I can identify key variables to be considered I can raise questions containing scientific knowledge and understanding Where appropriate, I can make predictions based on scientific understanding I can select apparatus for a range of tasks and plan to use equipment effectively I can identify an appropriate approach
Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	I can make a series of observations, comparisons or measurements with precision appropriate to the task
Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables and bar graph	I can record observations and measurements systematically I can present data as line graphs I can use appropriate scientific language and conventions to communicate quantitative and qualitative data
Using test results to make predictions to set up further comparative and fair tests	I am beginning to repeat observations and measurements

	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of results, explanations of and degree of trust in results, in oral and written forms such as displays and other presentation	I can draw conclusions that are consistent with the evidence I am beginning to relate these to scientific knowledge and understanding I can offer simple explanations for differences in results
	Identifying scientific evidence that has been used to support or refute ideas or arguments	I can recognise that different people may interpret evidence in different ways I can describe how experimental evidence and creative thinking have been combined to provide a scientific explanation I can make practical suggestions about how my working methods could be improved