Knebworth Primary School Science Matrix

Children will develop curiosity and an awe and wonder about the science in the world around them.

"Science is the word we use to describe a method of organising our curiosity."

Tim Minchin

The topics are highlighted to show the main science discipline that they come under, blue for Physics, brown for Chemistry and green for Biology.

Deep Rox	Autumn		Spring		Summer		Key Vocabulary
				Knowledge	Skills	Knowledge	
Y1	Ask simple questions and recognise that they can be answered in different ways identifying and classifying -eg light sources using their observations and ideas to suggest answers to questions	**Seasonal Change (ongoing through the year)** Know the names of the seasons Know how trees change through the seasons. Know that day length changes **Our body and senses** Name external body parts. Name the five senses Know which parts of our body are	identify and classify eg use physical properties / observable features of animals, birds etc observe closely, using simple equipment perform simple tests eg waterproof materials	**Everyday Materials** Distinguish objects from materials Know the main 5 everyday materials and their properties Know what **Charles Macintosh** invented.	identify and classify observing changes over time – eg growth of sunflowers observe closely, using simple equipment	**Plants** Know the difference between evergreen and deciduous trees and know the names of some. Know the main parts of a flower. Know the main parts of a tree. Name 3 wild flowers, 3 garden flowers.	Spring, Summer, Autumn. Winter Sun, Day, Moon, Night, Light, Dark Body parts eg elbow, shoulder, knee, ankle, Touch, taste, smell, see, hear, reflect opaque transparent Wood, plastic, glass, paper, rock,

		used for each sense. **Light and Dark** Name 3 light sources Know how to stay safe in the dark. Know that a mirror is not a light source and it reflects light. Know what **Thomas Edison** invented.		https://bpes.bp.com/super-scientists-charles-macintosh-primary **Animals including humans** Name 3 birds, 3 mammals, an amphibian, a reptile. Know the main structure of common animals and birds Know the differences between herbivores carnivores and omnivores.	Draw a simple diagram-eg label parts of a flower		Hard, Soft, Rough, Smooth, waterproof fish, amphibians, reptiles, birds and mammal herbivore, carnivore, omnivore deciduous, evergreen trees, leaves, flowers (blossom), petals, fruit, roots, bulb, seed, trunk, branches, stem
Y2	ask simple questions and recognising that they can be answered in different ways using their observations and ideas to suggest	**Animals including humans** Know that animals including humans need water, food and air to survive. Life cycle of human and animal	Make simple predictions Perform simple tests eg more than one battery in a circuit	**Electricity** Know how to make a simple circuit that lights a bulb Know the dangers involved with electricity	Make simple predictions Carry out simple comparative tests eg conditions for good plant growth	**Living things and their habitats** Know whether things are alive, dead or have never lived with examples.	Diet, hygiene, offspring life cycle, reproduces suitable, unsuitable, properties, bend, twist, stretch, squash, fragile, absorbent

	answers to questions perform simple tests gather and record data in a table to help answer questions	Know the importance of exercise, eating the right amounts of different foods and hygiene. **Uses of everyday materials** Know the shape of some materials can be changed by bending, twisting, squashing and stretching.	Draw a simple diagram – eg circuit gather information and write up results	**Plants** Know the main changes as seeds and bulbs grow into mature plants Know plants need water, light and a suitable temperature to grow and stay healthy and explain the impact of changing these.	Draw a simple diagram –eg parts of a bulb gather information and write up results group and classify eg habitat wildlife using simple equipment where appropriate, to answer questions: find things out using secondary sources for information	Know a simple food chain identifying predator and prey. Know how animals get their food from other animals or plants in their habitat Name 3 different habitats with wildlife found there and know a micro habitat.	wires. bulb. battery, circuit hazard
Y3	Create own scientific question set up simple practical enquiries, comparative and fair tests eg magnet strength, what	**Rocks** Know how fossils are formed Name 3 different rocks.	Set up simple practical enquiries, comparative and fair tests eg what damages our teeth? Which	**Teeth and digestion** Name the types of teeth. Know the main food groups and	Set up simple practical enquiries, comparative and fair tests eg what happens when roots are removed from a plant	**Plants** Know the function of the roots, stem, leaves and flower Know how water is transported in plants.	Repel, attract, force, magnetic poles, friction, Physics incisor canine molar

	damages our teeth? taking accurate measurements using standard units Record findings in a table eg effect of friction on toy car Make predictions	Know soil is made from rock and organic matter Know who **Mary Anning** was and what she did. **https://bpes.bp.com/super-scientists-mary-anning-primary**	rock is the hardest? Report on findings from enquiries, including oral and written explanations- eg teeth experiment results Make comparisons eg teeth of herbivore/ carnivore Make predictions Use a range of equipment eg magnifying glasses Record findings using simple scientific	the importance of a balanced diet. Know the parts of the digestive system and what they do Describe what happens to the food we eat. Know and label a complete food chain starting with the sun. Who was **William Beaumont** what did he do? **Forces and Magnets** Know that magnetism is a non-contact force. Know that like poles repel and opposites attract. Know not all metals are magnetic.	Report on findings from enquiries, including oral and written explanations Make predictions Record findings using a bar chart. Eg shadows Use a range of equipment eg mirrors Record findings using simple scientific language and drawings Use results to draw simple conclusions Take accurate measurements using standard units	Know the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal. Know how the requirements of plants for life and growth vary from plant to plant eg cactus **Light** Know you should never look at the sun and why. Know that light is reflected from surfaces Know that shadows are formed when the light from a light source is blocked by an opaque object.	vitamin protein carbohydrate fibre mineral oesophagus intestines colon enzymes Biology producer, consumer

			language and drawings Use results to draw simple conclusions Make systematic and careful observations eg rock expts	Know the effect of friction. Know who **William Gilbert** was and what he did.	Make systematic and careful observations eg shadow length	Know how shadows change over a day. Know how shadows change when light source is moved closer or further away.	
Y4	set up simple practical enquiries, comparative and fair tests– eg evaporation of different liquids observe over time g evaporation using results to draw simple conclusions taking accurate measurements using standard units and a range of equipment. eg	**States of matter** Name the three different states of matter and know the characteristics. Know that the state can be changed by heating or cooling and it occurs at different temperatures depending on the material. **Sound**	record findings using simple scientific language and labelled diagrams eg series circuit Make predictions identify differences, similarities or changes related to simple	**Electricity** Know how a switch works Know what is meant by a series circuit. Know how a circuit can be affected by making a change. Know the recognised symbols for a series circuit.	record findings using simple scientific language and labelled diagrams eg working muscles, bones identify differences, similarities or changes related to simple scientific ideas and processes	**Skeletons and muscles** Know skeletons and muscles are used for support, protection and movement. Know the difference between endoskeleton and exoskeleton. **Living things and their habitats**	solid, liquid, gas, state, evaporation, condensation, particles, Chemistry pitch, vibration, wave, tone, source, Physics buzzer, motor, series, circuit, switches, conductor, insulator

	temperature changes take place, decibels of sound find and describe patterns eg pitch with different size saucepan lids gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	Know that sound is caused by vibration Know that sound travels through the air to the ear Know the relationship between pitch and source. Know the relationship between volume, vibration strength and distance from source. Know who **Galileo Galilei** was and what he did. https://bpes.bp.com/super-scientists-galileo-galilei	scientific ideas and processes	Know some insulators and conductors including metal Know who **Michael Faraday** was and what he did. Know who **Nikola Tesla** was and we did. https://bpes.bp.com/super-scientists-nikola-tesla-primary	Record information using charts, keys	Know what vertebrate and invertebrate means and give 3 examples of each. Know how to sort living things into groups Know how environments can change and this may have an impact on living things **David Attenborough** **Greta Thunberg – Environmentalist**	
Y5	To observe change over time eg moon diary take measurements, using a range of	**Earth and Space** Know how day and night occur. Name the planets.	raise further questions that could be investigated, based on their	**Properties and changes of materials** Know how the properties of materials suit	Use different types of enquiry to answer questions – observing changes over time eg chicks	**Animals including humans** Know the changes that occur as humans develop.	rotation axis phases constellation crescent Planet names, Physics resistance mechanism gravity

	scientific equipment, with increasing accuracy and precision, take repeat readings when appropriate eg newton meter to test strength	Describe the shapes and movements of sun, moon and Earth. Know who **Stephen Hawking** was and what he did. https://bpes.bp.com/super-scientists-stephen-hawking Know who **Maggie Aderin - Pocock** is and what she did. https://bpes.bp.com/super-scientists/maggie-aderin-pocock **Forces** Know the effect of air and water resistance. Know gravity is a force and its effect	data and observations. Recognise and control variables Plan comparative, fair tests Use secondary sources to research and discuss eg new materials report and present findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results	them for different purposes Know 2 substances that dissolve to create a solution. Know how to get substances back from a solution Know how mixtures can be separated. Know when and why changes are reversible or not Know who **Jamie Garcia** is and what she is doing. https://bpes.bp.com/super-scientists-jamie-garcia-primary	recognises which secondary sources will be most useful to research their ideas and discuss	Know where babies come from. Know what to expect from puberty. **Living things and their habitats** Know the differences in the life cycles of a mammal, an amphibian, an insect and a bird. **Jane Goodall - Chimpanzees** Know the difference between sexual and asexual reproduction	gears pulleys Newtons, Physics hardness, solubility, transparency, conductivity, magnetism mixture, filtration. dissolve evaporation, Chemistry reversible, irreversible

		Know levers gears and pulleys increase a force. Know about what **Isaac Newton** did https://bpes.bp.com/super-scientists-isaac-newton-primary					
Y6	report and present findings in oral and written forms identifying scientific evidence that has been used to support or refute ideas or arguments	**Circulatory System** Know the function of heart, blood vessels and blood. Describe the changes in blood as it goes around the system. Know the effect diet, exercise, lifestyle and drugs have on how the body functions. Know who **William Harvey** was and what he did.	ask their own questions about the scientific phenomena that they are studying use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate describe and evaluate their	**Evolution and Inheritance** Know that living things have changed over time. Know that fossils provide information about living things that inhabited the Earth millions of years ago. Know that living things produce offspring of the same kind but that they vary and are not identical to their parents.	ask their own questions about the scientific phenomena that they are studying Uses and develops keys to identify, classify and describe living things Use relevant scientific language to describe and evaluate their own and others' scientific ideas	**Living things and their habitats** Know how to classify plants, animals and micro-organisms into broad groups, Name some micro-organisms. Know the broad groups can be subdivided. Know who **Carl Linnaeus** was and what he did.	circulatory, blood vessels, veins, arteries, oxygenated, deoxygenated, valve, respiration, Biology Fossils, Adaptation, Evolution, Characteristics, Reproduction, Genetics, Biology Refraction, Reflection, Light, Spectrum, Rainbow, Physics

			own and others' scientific ideas Select the most appropriate ways to answer questions, recognising and controlling variables where necessary	Know how animals have adapted to suit their environment and this can lead to evolution. Know who **Alfred Wallace and Charles Darwin** were and what they did. https://bpes.bp.com/super-scientists-charles-darwin-primary **Light** Know that light from light sources and reflected light travel in straight lines. Know how a periscope works Know and be able to explain how we see objects. Know the main parts of the eye.			

				Know who **Patricia Bath** is and what she did. https://bpes.bp.com/super-scientists-patricia-bath-primary			

We have identified the most crucial knowledge that we want to ensure all children know in each year group. These are called our 'Golden Nuggets'. These are identified by a golden box around the statement