Waverley Abbey Scientist

All things are possible for one who believes – Mark 9:23.

At Waverley Abbey we wish our children to develop their natural curiosity about the world around us. To ask questions, to explore and discover, and to draw their own conclusions from their enquiries and observations. Children need to understand not only how things work, but also develop their knowledge of how to discover things for themselves; designing investigations to test theories and adapting their understanding in light of their findings.

We encourage children to use scientific vocabulary in lessons, both in relation to knowledge and to working scientifically skills in order to demonstrate and explain their thinking and understanding of the topic being studied. We aim to do this through practical learning, fostering excitement and wonder at this amazing world we live in. This practical element of science is essential in helping children to realise that science is all around them – it is what makes up everything we see, explains how things work and it is still leaving us with further questions to be answered.

We want children to leave Waverley Abbey as scientists: continually questioning, enquiring, investigating and adapting their understanding of the world, having been encouraged and equipped to do so, during their time here.

Curriculum enrichment – Trips and internal workshops also form a part of our science curriculum here at Waverley Abbey. In Year 6, we make links with secondary schools, such as Weyden, and also have a visit from 'zoolab'. Further down the school, in Year 4, a trip is taken to Winchester Science centre. STEM Week is an exciting time for all at Waverley Abbey, as we invite some specialists in to deliver a range of workshops for the children each year. We also have a focus on scientific experiments and activities during this week, encouraging pupils to think about everyday discoveries and to get 'hands-on'.

Diverse Scientists Suggestions	Year 3 (All blocked)	Year 4	Year 5	Year 6
Autumn 1	Animals including Humans (Skeleton)	Living things and their habitats (Classification) David Attenborough / Sarah Fowler	Earth and Space Chichester Planetarium Trip Mae Johnson / Maggie Aderin-Pocock / Christina Koch / Margaret Gellar / Sheila Kanani	Living things and their habitats (Classification) Chris Nelson / Carl Linnaeus
Autumn 2	Animals including Humans (Nutrition) Adelle Davis	Sound Alexander Graham Bell	Forces Emma England / Isaac Newton	Electricity (though Fairgrounds Project) Peter Rawlinson / Edison / Tesla
Spring 1	Rocks and Fossils Holly Betts / Anjana Khatwa	Animals incl Humans: Teeth / Digestive System	Properties and Changes of materials Jyoti Sehdev / Joe Keddie / Spencer Silver	
Spring 2	STEM Week - Forces (Magnets)	STEM week - States of Matter Pearle Agyakwa	Properties and Changes of materials Jyoti Sehdev / Joe Keddie / Spencer Silver Water Cycle – STEM week / Global Citizen Lesson	STEM week - Evolution & Inheritance Mary Anning/Alfred Wallace / Charles Darwin / Nazneen Rahman / Kelsey Byers
Summer 1	Living things and their habitats (Plants) Wisley Trip Alistair Griffiths / Agnes Arber / Angie Burnett	Electricity Benjamin Franklin / Alessandro Volta / Thomas Edison/ Lewis Latimer	Living things and their habitats (Life cycles) Sarah Fowler OBE - Marine Biologist Rachael Carson David Attenborough (Life processes)	Animals including Humans (Circulatory & Respiratory Systems)
Summer 2	Light Colin Webb		Recap and (Life processes)	Light (Working Scientifically focus)

Science vocabulary progression by unit

Science Topic	Year 1-2	Year 3-4		Year 5-6
Working scientifically	experience observe changes patterns grouping sorting classifying compare identify (name) data measure record equipment questions test investigate explore magnifying glass / hand lens same different	develop enquiry practical enquiry fair test comparative test relationships conclusion accurate thermometer data logger estimate data diagram key (identifying) table chart	bar chart results predictions explanation reason similarity difference question evidence information findings criteria values properties characteristics	variables evidence justify accuracy precision scatter graphs bar graphs line graphs argument (science) causal relationship

Science Topic	Year 1-2	Year 3-4
Plants	plants wild plants garden plants evergreen trees deciduous trees common flowering plants flowers vegetables leaf/leaves flower blossom petal stem trunk branch root seed bulb bud growth grow habitat local environment leaf fall water light temperature healthy growth survive soil germinate stages of growth	functions nutrients nutrition air transport (water) life cycle pollination seed formation seed dispersal reproduce fertiliser

Science Topic	Year 1-2		Year 3-4	Year 5-6
Animals, including humans	names of common animals: fish, amphibians, reptiles, birds, mammals carnivores herbivores omnivores human body senses see hear feel smell taste habitat local environment pet wild animal insect minibeast food eat head neck body arms legs ears eyes nose mouth tongue hands	feet fingers toes elbows knees hair teeth grow healthy offspring adults young water air survive exercise hygiene egg chick chicken caterpillar pupa moth butterfly tadpole frog frog spawn lamb sheep calf cow foal horse	nutrition diet skeleton muscles protection support movement bones skull shell digestive system stomach small intestine large intestine oesophagus types of teeth: molar, pre-molar, incisor, canine saliva	puberty gestation period circulatory system heart lungs blood vessels blood lifestyle disease water transportation nutrient transportation oxygen air breathing exercise diet drugs

Science Topic	Year 1-2	Year 3-4	Year 5-6
Electricity		electricity simple circuit light bulb cell wire buzzer switch motor battery series circuit conductor insulator	voltage components symbols circuit diagram
Science Topic	**Year 1-2**	**Year 3-4**	**Year 5-6**
Forces		move movement surfaces forces push pull contact distance magnet bar magnet ring magnet horseshoe magnet attract repel poles (of magnets) magnetic materials	gravity air resistance water resistance friction levers pulleys gears springs

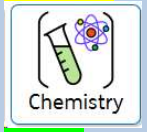
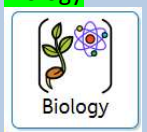
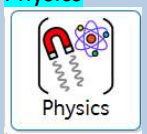
Science Topic	Year 1-2	Year 3-4	Year 5-6
Living things and their habitats (including evolution and inheritance)	pond garden field park woodland sea shore river ocean forest rainforest stones rocks logs leaf litter habitat micro-habitat living dead not living alive healthy food food chain depend source of food shelter grow growth healthy	environment non-flowering plants ferns mosses flowering plants grasses vertebrate animals: fish, birds, mammals, amphibians, reptiles invertebrate animals: snails, worms, slugs, spiders, insects human impact – litter, deforestation, population increase, nature reserves	life cycles reproduction life processes sexual and asexual reproduction (plants) root cuttings classification microorganisms organisms evolution evolve adaptation variation inherit inheritance

Science Topic	Year 1-2	Year 3-4	Year 5-6
Materials	everyday materials wood paper plastic metal glass water rock brick stone fabric material foil elastic dough rubber card cardboard clay object make/made hard/soft shiny/dull stretchy/stiff rough/smooth bendy/not bendy waterproof/not waterproof transparent/opaque absorbent/not absorbent squash twist bend stretch		properties hardness solubility transparency electrical conductivity thermal conductivity magnetism dissolve solution substance separating mixing filtering sieving reversible change burning rusting reactions irreversible change

Science Topic	Year 1-2	Year 3-4	Year 5-6
Rocks and soils		rock soil fossil organic matter grains crystals sedimentary rock	

Science Topic	Year 1-2	Year 3-4	Year 5-6
States of matter		solid liquid gas temperature heat (heating) cool (cooling) water cycle evaporation condensation melting freezing	

Science Topic	Year 1-2	Year 3-4	Year 5-6
Earth and space	seasons seasonal change spring summer autumn winter weather sun sunshine rain snow sleet ice frost fog cloud hot cold storm sky earth night day		solar system planets: Mercury, Venus, earth, Mars, Jupiter, Saturn, Neptune, Uranus moon stars spherical bodies rotation orbit satellite

		Year 3	Year 4	Year 5	Year 6
Topics studied Chemistry  Biology  Physics 	Aut 1	**ANIMALS, INCLUDING HUMANS – Skeleton (Blocked)** ▪ 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** Ask questions Observe & Classify Research / Use secondary sources – History link **Scientist Studied:**	**LIVING THINGS & HABITATS** ▪ 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 ▪ Identify how animals and plants are suited to and adapt to their environment in different ways. Observe & Classify Research / Use secondary sources – History link **Scientist Studied: Gerald Durrell** Classification Keys https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00357 Role of the Environment	**EARTH & SPACE** • 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 Observe Research / Use secondary sources – History link **Scientist Studied: Maggie Aderin-Pocock** The Solar System https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00316 Sun and Earth https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00317	**LIVING THINGS, HABITATS** ▪ 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 ▪ Relate knowledge of plants to studies of all living things Research / Use secondary sources – History link Classify **Scientist Studied: Carl Linnaus** Why Classify? https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00353 Classifying Living Things https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00354 Microorganisms

Planning Support: Explorify Hamilton Trust units – saved on system TigTag – Now Clickview		Current affairs link: what we eat – meat, processed food – effect on our health and the environment Diet and Exercise https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00362 The Human Skeleton https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00331 Joints and Muscles https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00332	https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00346 Invertebrates https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00355 Vertebrates https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00356	The Moon https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00318	https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00360
	Aut 2	**ANIMALS, INCLUDING HUMANS – Nutrition (Blocked)** ▪ **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 Ask questions Observe & Classify Research / Use secondary sources – History link D&T link – nutrition healthy dips **Scientist Studied:** Current affairs link: what we eat – meat, processed food – effect on our health and the environment Diet and Exercise https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00362 The Human Skeleton https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00331 Joints and Muscles https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00332	**SOUND** ▪ 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 Observe Pattern seeking Measure – Maths link **Scientist Studied: Alexander Graham Bell?** What is sound? https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00309 How does sound travel? https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00310 How do we hear? https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00311 Volume https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00313	**FORCES** ▪ 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 ▪ Describe, in terms of drag forces, why moving objects that are not driven tend to slow down. ▪ Understand that force and motion can be transferred through mechanical devices such as gears, pulleys, leavers and springs. Ask questions Make predictions Set up tests Observe Record data - Maths link (stats) Interpret & communicate results – English link Evaluate Research Link to DT – Making timers / products with levers etc Pulleys – Y6 fairground project **Scientist Studied: Isaac Newton** Gravity https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00298 Action and Reaction	**ELECTRICITY - All covered by D&T Fairgrounds project** ▪ 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 Link to DT – design circuits that can be controlled – Fairground project Electrical Circuits https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00290

				https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00299 Gears and Pulleys https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00300	
	Spring 1	**ROCKS (Blocked)** ▪ 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 ▪ relate simple physical properties of some rocks to their formation (igneous or sedimentary) ▪ Recognise that living things have changed over time and that fossils provide information about living things that have inhabited the Earth millions of years ago. ▪ Observe & classify Research / Use secondary sources – History link Explore Comparing **Scientist Studied:** Rocks https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00271 Soil https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00272	**ANIMALS, INCLUDING HUMANS** ● describe the simple functions of the basic parts of the digestive system in humans ● construct and interpret a variety of food chains, identifying producers, predators and prey ● identify the different types of teeth in humans and their simple functions Observe Research / Use secondary sources Explore Classify **Scientist Studied:** The Digestive System https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00333 Food Chains https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00348 Food Webs https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00349 Teeth https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00364	**PROPERTIES & CHANGES of MATERIALS** ▪ 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, oxidation and the action of acid on bicarbonate of soda. Ask questions Make predictions Set up tests Observe Explore Record data – Maths link (stats) Interpret, Evaluate& communicate results - English link Research **Scientist Studied: Jyoti Sehdev** Properties of Materials https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00268 Characteristics of Water	

				https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00258 Characteristics of Air https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00259 Separation by Evaporation https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00276	
	Spring 2	**MAGNETS (Forces and Magnets) STEM week** ▪ 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 two poles ▪ predict whether two magnets will attract or repel each other, depending on which poles are facing ▪ compare how things move on different surfaces ▪ notice that some forces need contact between two objects, but magnetic forces can act at a distance Ask questions Make predictions & draw conclusions Set up tests Observe & measure – Maths link Classify Explore Record data - Maths link (stats) Interpret & communicate/present results – English link **Scientist Studied:** Magnetism https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00292 Using Magnetism https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00293	**STATES OF MATTER – (Stem week incl)** • 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) • ~~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 (Y5)~~ Ask questions Classifying Comparing Make predictions & draw conclusions Set up tests Observe over time Research / Use secondary sources – History link Present findings **Scientist Studied:** Solids https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00254 Liquids https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00255 Gases https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00256 Changes of State https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00256	**PROPERTIES & CHANGES of MATERIALS** ▪ 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, oxidation and the action of acid on bicarbonate of soda. Ask questions Make predictions Set up comparative tests Observe Explore Record data – Maths link (stats) Interpret, Evaluate& communicate results - English link Research **Scientist Studied: Jyoti Sehdev** Properties of Materials https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00268 Characteristics of Water	**EVOLUTION and INHERITANCE (incl STEM week)** ▪ 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 how and why the human skeleton has changed over time, since we separated from other primates ▪ 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 ▪ Relate knowledge of plants to studies of evolution and inheritance Observe Compare Classify Research / Use secondary sources – History link **Scientist Studied: Charles Darwin** Current Affairs Link: global warming – are animals/plants adapting fast enough to survive in the changing climate? Adaptation https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00347 Evolution https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00351

		What is Force? https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00295 Friction https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00296 Reducing Friction https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00297		https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00258 Characteristics of Air https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00259 Separation by Evaporation https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00276 **THE WATER CYCLE – SPRING STEM Week** ▪ identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature Observe Research / Use secondary sources – History link Current affairs link: global warming – how has this changed the water cycle over time? Characteristics of Water https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00258 Characteristics of Air https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00259 Separation by Evaporation https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00276	
	Sum 1	**LIVING THINGS AND THEIR HABITATS: PLANTS (Blocked 2 wks)** • 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 • explore the part that flowers play in the life cycle of flowering plants, including	**ELECTRICITY** ▪ 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 Ask questions Make predictions Use secondary sources / research	**LIVING THINGS AND THEIR HABITATS** ▪ 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 Ask questions Observe Explore secondary sources / research Finding patterns **Scientist Studied: Sarah Fowler / David Attenborough** Life Cycles https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00328 Reproduction	**ANIMALS INCLUDING HUMANS** ▪ identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood (including the pulse and clotting) ▪ 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 Ask questions Make predictions Set up tests Observe / Notice patterns Record data - Maths link (stats)

		pollination, seed formation and seed dispersal Ask questions Make predictions Set up tests Observe & Classify Record data –Maths link (stats) Interpret & communicate results – English link **Scientist Studied:** Current Affairs link: how can we grow enough food to feed the growing population of the world? Parts of a Plant https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00338 Reproduction https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00339 Fertilisation and Dispersal https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00340	Set up tests Observe Explore Classify Link to DT – design circuits **Scientist Studied: Thomas Edison / Lewis Latimer** Series and Parallel Circuits https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00291 Conductors and Dangers of Electricity https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00289	https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00329	Interpret, explain & communicate/ present results – English link Set up further comparative, fair tests Evaluate Research **Scientist Studied:** The Circulatory System https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00335 The Respiratory System https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00334 Drug Awareness https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00363
	Sum 2	**LIGHT (Blocked)** ▪ 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 Ask questions Explore Observe & measure **Scientist Studied:**		**ANIMALS INCLUDING HUMANS (PSHE)** ▪ describe the changes as humans develop to old age Puberty - Taught alongside / within PSHE Observe Research / Use secondary sources – History link Comparing / Noticing patterns Life Cycles https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00328 **Mrs Gren**	**LIGHT** ▪ 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 and to predict the size of shadows when the position of the light source changes. Observe Explore Record data - Maths link (stats) Fair testing Designing investigation Longer term study – how the length of shadows changes at different times of the year.

		Longer term study: investigate how the size of shadows changes at different times of year. What is light? https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00302 The Sun as a light source https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00305 Light Sources https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00303			Reflection https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00306 Shadows https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00304 White Light https://www.tigtagworld.co.uk/mindmap/#/lessons/CLASS00307
	Year 3	Year 4	Year 5	Year 6	
Key skills to progress – To work scientifically	• ask relevant scientific questions • use observations and knowledge to answer scientific questions • set up a simple enquiry to explore a scientific question • set up a test to compare two things • set up a fair test and explain why it is fair • make careful and accurate observations, including the use of standard units • use equipment, including thermometers and data loggers to make accurate measurements • gather, record, classify and present data in different ways to answer scientific questions • use diagrams, keys, bar charts and tables using scientific language • use findings to report in different ways including oral and written explanations, presentation • draw conclusions and suggest improvements • make a prediction with a reason • identify differences, similarities and changes related to an enquiry		• plan different types of scientific enquiry • control variables in an enquiry • measure accurate and precisely using a range of equipment incl data loggers • record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs • use the outcome of test results to make predictions and set up a further comparative fair test • report and present findings from an enquiry • explain a conclusion from an enquiry • explain casual relationships in an enquiry • relate the outcomes from an enquiry to scientific knowledge in order to state whether evidence supports or refutes an argument or theory • Read, spell and pronounce scientific vocabulary accurately.	
Links to school values	**Growth –** children learn through wonder and intrigue **Compassion –** compassionate and knowledgeable about the world in which we live. **Honesty –** To admit mistakes and suggest ways of rectifying them through investigations. **Courage** – Take risks when predicting and investigating through a variety of scientific enquiry. **Hope –** To find ways to save the planet and improve life whilst living sustainable lives.				

	Love - compassionate and knowledgeable about the world in which we live.

The Learning Journey through Science topic areas to aid understanding of progression.

The learning journey: Animals including humans

Year group	Statutory Requirements from the Programme of Study
1	• Identify and name a variety of common animals that are birds, fish, amphibians, reptiles and mammals • 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 (birds, fish, amphibians, reptiles and mammals, and including pets). • Identify, name draw and label the basic parts of the human body and say which parts of the body is associated with each sense.
2	• 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.
3	• 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 animals have skeletons and muscles for support, protection and movement.
4	• 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.

5	• Describe the changes as humans develop from birth to old age.
6	• Identify and name the main parts of the human circulatory system, and explain 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.

The learning journey – 'Materials'

Year group	Statutory Requirements from the Programme of Study
1	• Distinguish between an object and the material from which it is made. • Identify and name a variety of everyday materials, including wood, plastic, glass, 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 physical properties.
2	• 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.
3	• 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.
4	• 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.
5	• 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 • Understand 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.

The learning journey: Plants

Year group	Statutory Requirements from the Programme of Study
1	• Identify and name a variety of common plants, including garden plants, wild plants and trees, and those classified as deciduous and evergreen • Identify and describe the basic structure of a variety of common plants including roots, stem/trunk, leaves and flowers.
2	• 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.
3	• Identify and describe the functions of different parts of plants; roots, stem, 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 ways in which water is transported within plants. • Explore the role of flowers in the life cycle of flowering plants, including pollination, seed formation and seed dispersal

The learning journey: Living Things and Their Habitats

Year group	Statutory Requirements from the Programme of Study
2	• 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 of animals and plants, and how they depend on each other. • Identify and name a variety of plants and animals in their habitats, including micro-habitats

	• 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.
4	• 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
5	• 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.
6	• 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

The learning journey – 'Forces'

Year group	Statutory Requirements from the Programme of Study
3	• 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 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 two poles • Predict whether two magnets will attract or repel each other, depending on which poles are facing.
5	• 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.

The learning journey – 'Light'

Year group	Statutory Requirements from the Programme of Study
3	• 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 sizes of shadows change.
6	• 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 to predict the size of shadows when the position of the light source changes.

The learning journey – 'Electricity'

Year group	Statutory Requirements from the Programme of Study
4	• 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.
6	• 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**.**

Year 1 Seasonal Change Reference to the Programme of Study 2014

Pupils should be taught to:

- Observe changes across the four seasons
- Observe and describe weather associated with the seasons and how day length varies.

Year 4 Sound Reference to the Programme of Study 2014

Pupils should be taught to:

- Identify how sounds are made, associating some of them with something vibrating
- Recognise that vibrations from a sound 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.

Year 5 Space Reference to the Programme of Study 2014

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

Year 6 Evolution Reference to the Programme of Study 2014

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.