Science Curriculum

Curriculum Intent

The curriculum intent for Wardley CE Primary school aims to:

- **Be ever-evolving**, providing opportunities for children to develop as independent, confident, resilient, successful & motivated learners striving for the pursuit of excellence who know how to make a positive and transformational contribution to their community and wider global society.
- **Be rooted in the school's Christian ethos**, encouraging our pupils to grow in self-awareness and becoming advocates of social justice, adaptable to any social context.
- **Be ambitious** in our aim for pupils to develop the communication skills necessary for learning and life, promoting enjoyment, high expectations and standards across all subject areas.
- **Be memorable**: providing diverse, social, moral, spiritual and cultural (SMSC) rich opportunities from which children learn and develop a range of transferable skills.
- **Be aspirational**, cultivating a sense of personal pride in achievement, provide a purpose and relevance for learning and ultimately to help every student to find strengths and interests.
- **Be inspiring**, to empower pupils to respect each other and themselves, show respect and understanding for people of all faiths, race and gender, and for all living things, promoting stewardship and ensuring children are well prepared for life in a rapidly changing world.

Scientific Intent

At Wardley, all children have the opportunity to develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics. We encourage children to be inquisitive throughout their time at the school and beyond.

Our ambitious Science curriculum fosters a healthy curiosity in children about our universe and promotes respect for the living and non-living. We believe science encompasses the acquisition of knowledge, concepts, skills and positive attitudes.

Science is a vibrant subject at Wardley about which we are incredibly passionate. Children ask lots of questions about the world around them, and we aim to provide them with the necessary core scientific knowledge and investigative skills to help them answer their specific questions.

Throughout the programmes of study, the children will acquire and develop the key knowledge that has been identified within each unit and across each year group, as well as the application of scientific skills. We ensure that the Working Scientifically skills are built-on and developed in each phase of school so that are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.

Science Curriculum

Wardley CE Primary School

"We can do all things"

Science Overview

Science Overview

	Autumn		Spring		Summer	
EYFS						
YEAR 1	**BIOLOGY** To understand animals & humans How do our senses help us to explore the world? **PHYSICS** Understand the Earth's movement in space What season is it and how do you know?	**CHEMISTRY** To investigate materials What are everyday objects made from? **PHYSICS** Understand the Earth's movement in space What season is it and how do you know?	**BIOLOGY** Understand animals and humans How are common animals different?	**BIOLOGY** To investigate living things How can we care for our planet? **PHYSICS** Understand the Earth's movement in space What season is it and how do you know?	**BIOLOGY** To understand plants How are common plants different?	**BIOLOGY** To understand plants What food can we grow in our garden? **PHYSICS** Understand the Earth's movement in space What season is it and how do you know?
YEAR 2	**BIOLOGY** To understand animals & humans What does it mean to be healthy?	**CHEMISTRY** To investigate materials Why do we use different materials to make different objects?	**BIOLOGY** Understand animals and humans How do living things survive?	**BIOLOGY** To investigate living things How do different habitats provide for different animals?	**BIOLOGY** To understand plants What do plants need to grow well?	**PHYSICS** Understand movement, forces and magnets How do I perform a simple test?
YEAR 3	**CHEMISTRY** To investigate materials How does one rock compare to another?	**BIOLOGY** To understand animals & humans Why do we need bones?	**PHYSICS** To understand light & seeing What can I see and how do I see it?	**BIOLOGY** To understand plants How do plants grow?	**PHYSICS** To understand movement, forces & magnets What is a magnet and what can it do?	**PHYSICS** To understand the Earth's movement in space Where is my planet and what does it do?
YEAR 4	**PHYSICS** To investigate sound & hearing How are sounds created and how do we hear them?	**BIOLOGY** To investigate living things What are living things and how do we classify them?	**CHEMISTRY** To investigate materials What is the key to changing states of matter?	**BIOLOGY** To understand animals & humans What role do teeth play in the digestive system?	**PHYSICS** To understand electrical circuits How do electrical components affect a circuit?	**WORKING SCIENTIFICALLY** What is the science behind bubbles?
YEAR 5	**PHYSICS** To understand the Earth's movement in space How does our solar system work?	**CHEMISTRY** To investigate materials Why are properties of materials important?	**BIOLOGY** To investigate living things What is the circle of life?	**PHYSICS** To understand movement, forces & magnets How do forces impact motion?	**BIOLOGY** Understand animals and humans What happens to our bodies as we get older?	**WORKING SCIENTIFICALLY** How do scientists work in the real world?
YEAR 6	**BIOLOGY** To investigate living things Why do we classify critters?	**BIOLOGY** To understand animals & humans Staying alive and staying healthy - how do we do it?	**BIOLOGY** To understand evolution & inheritance What is evolution and inheritance?	**PHYSICS** To understand light & seeing Ho can we prove that light travels in straight lines?	**PHYSICS** To understand electrical circuits Electricity - how does it work and how can we sustain it?	**BIOLOGY** Understand evolution and inheritance Are dinosaurs important?

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Early Years

Science Features in EYFS

In nursery and reception children will, within their Understanding the World work towards the following outcomes:

- Children will be able to make sense of their physical world
- Build important knowledge and sense of the world around them from stories, investigations and visits
- Begin to talk about why things happen and make simple predictions

By the end of Reception children should:

<u>The Natural World</u>

- Explore the natural world around them, making observations and drawing pictures of animals and plants
- Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.
- Understand the effect of the changing seasons on the natural world around them

Science Overview EYFS

	Autumn term		Spring term		Summer term	
Nursery	• To learn how to take care of themselves	• To explore natural objects from their surrounding environment • To learn about their senses • To explore light sources • To shine light on or through different materials	• To identify electrical devices • To use battery powered devices (bee – bots) • To explore how things work • To feel forces	• To explore their natural surroundings • To explore a range of materials • To shape and join materials • To combine and mix ingredients	• To learn about the life cycles of animals • To plant seeds	• To compare adult animals to their babies • To observe how baby animals change over time • To explore animals in their natural environment
Reception	• To name body parts • To describe people who are familiar to them • To learn how to take care of themselves • To develop a deeper understanding of their senses	• To listen to sounds outside and identify the sounds • To make sounds • Explore how to change how things work	• To explore a range of materials including natural materials • To observe, measure and record how materials changed when heated and cooled • To compare how materials change over time and in different conditions • To explore shadows and rainbows	• To name and describe animals that live in different habitats • To explore plants and animals in contrasting environments	• Life cycles • To compare and describe adult animals to their babies • To observe how baby animals change over time	• Similarities and differences between plants • Growing plants • Observing the changes as plants grow • To explore plants in their natural environment • Make objects from different materials including natural materials

Science Curriculum

Threshold Concepts: Disciplinary Knowledge Biology, Chemistry & Physics

Science: Threshold Concepts - Biology

Biology: Understand animals and humans

By the end of KS1		By the end of LKS2		By the end of UKS2	
• identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals • identify and name a variety of common animals that are carnivores, herbivores and omnivores	• notice that animals, including humans, have offspring which grow into adults	• 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	• describe the simple functions of the basic parts of the digestive system in humans	• describe the changes as humans develop to old age.	• identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood
• describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets)	• describe the basic needs of animals, including humans, for survival (water, food and air)	• identify that humans and some other animals have skeletons and muscles for support, protection and movement.	• identify the different types of teeth in humans and their simple functions	• describe the ways in which nutrients and water are transported within animals, including humans.	• recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function
• identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	• describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene.		• construct and interpret a variety of food chains, identifying producers, predators and prey.		

Science: Threshold Concepts - Biology

Biology: Investigate living things

By the end of KS1	By the end of LKS2	By the end of UKS2	
• explore and compare the differences between things that are living, dead, and things that have never been alive	• recognise that living things can be grouped in a variety of ways	• describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird	• describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals
• 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	• explore and use classification keys to help group, identify and name a variety of living things in their local and wider environment	• describe the life process of reproduction in some plants and animals	• give reasons for classifying plants and animals based on specific characteristics
• identify and name a variety of plants and animals in their habitats, including Microhabitats • 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.	• recognise that environments can change and that this can sometimes pose dangers to living things.		

Science: Threshold Concepts - Biology

Biology: Understand evolution and inheritance

By the end of KS1	By the end of LKS2	By the end of UKS2
• *identify how humans resemble their parents in many features.*	• *identify how plants and animals including humans, resemble their parents in many features.* • *recognise that living things have changed over time and that fossils provide information about living things that inhibited the Earth millions of years ago.*	• recognise that living things have changed over time and that fossils provide information about living things that inhibited 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 suited to and adapt to their environment in different ways.*	• identify how animals and plants are suited to and adapt to their environment in different ways.

Science: Threshold Concepts - Biology

Biology: Understand plants

By the end of Key Stage 1		By the end of Lower Key Stage 2	By the end of Upper Key Stage 2
Common plants	Plants seed and growth	Basic structure and functions of a plant	Reproductive processes linked to Investigating living things
• identify and name a variety of common wild and garden plants, including deciduous and evergreen trees • identify and describe the basic structure of a variety of common flowering plants, including trees.	• 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.	• 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 pollination, seed formation and seed dispersal	• to know the parts of flowering plants. • to know how flowering plants reproduce. • to describe the process of asexual reproduction in plants. • give reasons for classifying plants based on specific characteristics.

Science: Threshold Concepts - Chemistry

Chemistry: Investigate materials

By the end of KS1 Everyday Materials	By the end of KS1 Uses of Everyday Materials	By the end of Lower Key Stage 2		By the end of UKS2
		Rocks	States of Matter	Properties and changes of Materials
• distinguish between an object and the material from which it is made. • describe the simple physical properties of a variety of everyday materials.	• identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. • compare and group together a variety of everyday materials on the basis of their simple physical properties.	• Compare and group together different kinds of rocks on the basis of their simple, physical properties. • Describe, in simple terms, how fossils are formed when things that have lived are trapped within sedimentary rock.	• 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).	• 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 how some materials will dissolve in liquid form a solution and describe how to recovery substance from a solution. • explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes in oxidisation and the action of acid on bicarbonate of soda.
• identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock.	• find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching	• recognise that soils are made of rocks and organic matter. • relate the simple physical properties of some rocks to their formation igneous or sedimentary).	• identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature.	• 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.
• 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 simple physical properties				• give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday forces of motions. • demonstrate that dissolving, mixing and changes of state are reversible changes.

Science: Threshold Concepts - Physics

Physics: Understand light and seeing

By the end of LKS2	By the end of UKS2
• 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.	• understand 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 eyes.
• 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 objects.	• 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.
• Find patterns in the way that the size of shadows change.	

Science: Threshold Concepts - Physics

Physics: Investigate sound and hearing

By the end of LKS2	By the end of UKS2
• 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.

Science: Threshold Concepts - Physics

Physics: Understand electrical circuits

By the end of LKS2	By the end of UKS2
• 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.	• Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the Circuit
• 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.	• 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
• Recognise some common conductors and insulators, and associate metals with being good conductors.	• Use recognised symbols when representing a simple circuit in a diagram

Science: Threshold Concepts - Physics

Physics: Understand movement, forces and magnets

By the end of LKS2	By the end of UKS2 Forces	By the end of UKS2 Magnets
• Compare how things move on different surfaces. • Notice that some forces need contact between 2 objects, but magnetic forces can act at a distance. • Observe how magnets attract or repel each other and attract some materials and not others.	• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	• Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object
• 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.	• Identify the effects of air resistance, water resistance and friction, that act between moving surfaces	• Identify the effects of air resistance, water resistance and friction, that act between moving surfaces
• Describe magnets as having 2 poles. • Predict whether 2 magnets will attract or repel each other, depending on which poles are facing.	• Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect	• Recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect

Science: Threshold Concepts - Physics

Physics: Understand the Earth's movement in space

By the end of LKS2	By the end of UKS2 Forces	By the end of UKS2 Magnets
• observe changes across the four seasons. • observe and describe weather associated with the seasons and how day length varies.	• *describe the movement of the Earth relative to the Sun in the solar system.* • *describe the movement of the Moon relative to the Earth.*	• 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.
• 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 the Sun, Earth and Moon as approximately spherical bodies. • use the idea that the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.

Science Curriculum

Threshold Concepts: Disciplinary Knowledge Working Scientifically

Science Threshold Concepts: KS1 Working scientifically

	Asking simple questions and recognising that they can be answered in different ways	Observing closely, using simple equipment	Performing simple tests	Identifying and classifying	Gathering and recording data to help in answering questions	Using their observations and ideas to suggest answers to questions
By the end of Key Stage 1	While exploring the world, the children develop their ability to ask questions (such as what something is, how things are similar and different, the ways things work, which alternative is better, how things change and how they happen). Where appropriate, they answer these questions. • The children answer questions developed with the teacher often through a scenario. • The children are involved in planning how to use resources provided to answer the questions using different types of enquiry, helping them to recognise that there are different ways in which questions can be answered	Children explore the world around them. They make careful observations to support identification, comparison and noticing change. They use appropriate senses, aided by equipment such as magnifying glasses or digital microscopes, to make their observations. • They begin to take measurements, initially by comparisons, then using non-standard units.	The children use practical resources provided to gather evidence to answer questions generated by themselves or the teacher. They carry out: tests to classify; comparative tests; pattern seeking enquiries; and make observations over time.	Children use their observations and testing to compare objects, materials and living things. They sort and group these things, identifying their own criteria for sorting. • They use simple secondary sources (such as identification sheets) to name living things. They describe the characteristics they used to identify a living thing.	The children record their observations e.g. using photographs, videos, drawings, labelled diagrams or in writing. • They record their measurements e.g. using prepared tables, pictograms, tally charts and block graphs. • They classify using simple prepared tables and sorting rings.	Children use their experiences of the world around them to suggest appropriate answers to questions. They are supported to relate these to their evidence e.g. observations they have made, measurements they have taken or information they have gained from secondary sources. • The children recognise 'biggest and smallest', 'best and worst' etc. from their data.

Science Threshold Concepts: LKS2 Working scientifically

	Asking relevant questions and using different types of scientific enquiries to answer them	Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers ad data loggers	Setting up simple practical enquiries, comparative and fair tests	Gathering, recording classifying and presenting data in a variety of ways to help in answering questions. Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables	Using straightforward scientific evidence to answer questions or to support their findings	Identifying differences, similarities or changes to related to simple scientific ideas and processes
By the end of Lower Key Stage 2	The children consider their prior knowledge when asking questions. They independently use a range of question stems. Where appropriate, they answer these questions. • The children answer questions posed by the teacher. • Given a range of resources, the children decide for themselves how to gather evidence to answer the question. They recognise when secondary sources can be used to answer questions that cannot be answered through practical work. They identify the type of enquiry that they have chosen to answer their question.	The children make systematic and careful observations. • They use a range of equipment for measuring length, time, temperature and capacity. They use standard units for their measurements	The children select from a range of practical resources to gather evidence to answer questions generated by themselves or the teacher. • They follow their plan to carry out: observations and tests to classify; comparative and simple fair tests; observations over time; and pattern seeking. Explanatory note A comparative test is performed by changing a variable that is qualitative e.g. the type of material, shape of the parachute. This leads to a ranked outcome. A fair test is performed by changing a variable that is quantitative e.g. the thickness of the material or the area of the canopy. This leads to establishing a causative relationship.	The children sometimes decide how to record and present evidence. They record their observation e.g. using photographs, videos, pictures, labelled diagrams or writing. They record their measurements e.g. using tables, tally charts and bar charts (given templates, if required, to which they can add headings). They record classifications e.g. using tables, Venn diagrams, Carroll diagrams. • Children are supported to present the same data in different ways in order to help with answering the question.	• Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. The answers are consistent with the evidence.	• Children interpret their data to generate simple comparative statements based on their evidence. They begin to identify naturally occurring patterns and causal relationships

Science Threshold Concepts: LKS2 Working scientifically

	Using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions
By the end of Lower Key Stage 2	They draw conclusions based on their evidence and current subject knowledge. • They identify ways in which they adapted their method as they progressed or how they would do it differently if they repeated the enquiry. • Children use their evidence to suggest values for different items tested using the same method e.g. the distance travelled by a car on an additional surface. • Following a scientific experience, the children ask further questions which can be answered by extending the same enquiry.	• They communicate their findings to an audience both orally and in writing, using appropriate scientific vocabulary.

Science Threshold Concepts: UKS2 Working scientifically

	Planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary	Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate	Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs	Identifying scientific evidence that has been used to support or refute ideas or arguments
By the end of Upper Key Stage 2	Children independently ask scientific questions. This may be stimulated by a scientific experience or involve asking further questions based on their developed understanding following an enquiry. • Given a wide range of resources the children decide for themselves how to gather evidence to answer a scientific question. They choose a type of enquiry to carry out and justify their choice. They recognise how secondary sources can be used to answer questions that cannot be answered through practical work. • The children select from a range of practical resources to gather evidence to answer their questions. They carry out fair tests, recognising and controlling variables. They decide what observations or measurements to make over time and for how long. They look for patterns and relationships using a suitable sample.	The children select measuring equipment to give the most precise results e.g. ruler, tape measure or trundle wheel, force meter with a suitable scale. • During an enquiry, they make decisions e.g. whether they need to: take repeat readings (fair testing); increase the sample size (pattern seeking); adjust the observation period and frequency (observing over time); or check further secondary sources (researching); in order to get accurate data (closer to the true value).	The children decide how to record and present evidence. They record observations e.g. using annotated photographs, videos, labelled diagrams, observational drawings, labelled scientific diagrams or writing. They record measurements e.g. using tables, tally charts, bar charts, line graphs and scatter graphs. They record classifications e.g. using tables, Venn diagrams, Carroll diagrams and classification keys. • Children present the same data in different ways in order to help with answering the question.	Children answer their own and others' questions based on observations they have made, measurements they have taken or information they have gained from secondary sources. When doing this, they discuss whether other evidence e.g. from other groups, secondary sources and their scientific understanding, supports or refutes their answer. • They talk about how their scientific ideas change due to new evidence that they have gathered. • They talk about how new discoveries change scientific understanding.

Science Threshold Concepts: UKS2 Working scientifically

	Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations	Using test results to make predictions to set up further comparative and fair tests
By the end of Upper Key Stage 2	In their conclusions, children: identify causal relationships and patterns in the natural world from their evidence; identify results that do not fit the overall pattern; and explain their findings using their subject knowledge. • They evaluate, for example, the choice of method used, the control of variables, the precision and accuracy of measurements and the credibility of secondary sources used. • They identify any limitations that reduce the trust they have in their data. • They communicate their findings to an audience using relevant scientific language and illustrations.	• Children use the scientific knowledge gained from enquiry work to make predictions they can investigate using comparative and fair tests.

Science Curriculum

Substantive Knowledge

The substantive knowledge is the scientific knowledge and vocabulary that is developed within our science curriculum. This knowledge is covered through the curriculum strands of physics, biology and chemistry. As such, this substantive knowledge has been embedded within the threshold concepts for physics, biology and chemistry. We believe that it is through the use of these disciplinary skills that the pupils become more expert in their substantive knowledge. This substantive knowledge is further detailed in our science knowledge organisers.

Science Curriculum

Science: Progression of Vocabulary

The national curriculum for science reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their scientific vocabulary and articulating scientific concepts clearly and precisely. At Wardley, they are assisted in making their thinking clear, both to themselves and others, and teachers ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

Language is vital for communication and children enjoy learning and understanding new words.

Children will be able to use the vocabulary of preceding topics as well as those listed for their current science topic. All the vocabulary listed here is taken from the science curriculum or related subjects, such as mathematics.

Science progression of vocabulary

	By the end of Key Stage 1		By the end of Lower Key Stage 2		By the end of Upper Key Stage 2	
Working scientifically	above answer area (non-maths meaning) below centre clockwise close to different direction distant down equal to event far further group half high(er) larger least less than low(er) more than most near nearly new(er) non-fiction old(er) pattern point position	amount appearance beyond contains difference distance document exact exactly fair test fractions left nearest property represents right scale similarity stands for strategy symmetrical	acute approximate approximately area (maths meaning) case study corresponding data data logger degrees down equivalent evidence fact group hypothesis impact necessary negative obstacle obtuse opinion outcome parallel positive primary source quantity relationship remainder round secondary source theory up	3D shape terminology accurate base comparative concave convention convex cylindrical decrease exception factor increase intricate negative numbers origin precise reliability rotation spherical statistics systematic translation trend typical unique	abundant cancel out capacity causal complex control correlate crucial dependent diagonal distribution exceptional imperial units maximum million minimum percentage perspective phenomenon reflex angle rigorous rotation sparse sustain variable	appropriate accuracy arc authentic bias circumference concentric controversy cross-section degree of trust diameter intersecting plane plausible proportion radius ratio recurring robust stance tertiary source

Science progression of vocabulary

	By the end of Key Stage 1				By the end of Lower Key Stage 2				By the end of Upper Key Stage 2		
Plants	berry blossom branch buds bulb flower food fruit leaf/leaves petal	Trunk tree deciduous evergreen root seed soil stalk stem earth (soil) function germinate	growth healthy mature nutrients pollination seed dispersal seedling shoot structure vegetation wither		absorb anther carpel fertiliser filament ovary ovule pollen pollination seed formation		sepal stamen stigma style transported				
Animals, including humans	animal baby beak bird claw cub egg eyes family feather fin fish fur mouth neck mouth neck nest nocturnal	pets pup reptile scales tail tame teeth wild Wing alive breathe dead feed grow living meat eater move plant feeder	adult amphibian bones brain child develop ear lobe eyebrows heart insect live young lungs mammal off-spring skeleton	teenager toddler wrist young	adulthood artery babyhood backbone bones brain childhood contraction heart invertebrate joints muscles offspring ribs skull	sockets spine survival tendons vein vertebrates windpipe	breakdown chemical digestion digestive system endoskeleton excrete exoskeleton faeces gastric juices large intestine oesophagus reabsorb reabsorption	rectum saliva salivary gland sewage small intestine stomach	arachnid birth chromosomes crustacean embryo fertilisation gestation infancy mollusc ovary ovum placenta uterus zygote	aerobic air sacs alveoli aorta artery blood vessels bronchi bronchioles capillaries carbon dioxide circulatory system clotting deoxygenated diaphragm	gaseous exchange haemoglobin oxygenated plasma pulmonary red blood cells respiratory system respire trachea vein ventricles white blood cells

Science progression of vocabulary

	By the end of key Stage 1			By the end of Lower Key Stage 2			By the end of Upper Key Stage 2		
Habitats		adapted conditions damp dark dinosaur environment food chain food source habitat indigenous life cycle log microhabitat microscopic pond	predator prey produce reproduce suited surroundings variety woodland	Antarctic Circle Arctic Circle carnivore characteristics climate climate zones consumer desert food web forest grassland herbivore life process omnivore population	producer soil survive temperate tropical tundra vegetation	anemometer barometer biome classification deforestation dominant environmental fungus/fungi invertebrates key mould organism pollution population region	variation Vertebrates deciduous evergreen flowering plants garden plants grasses non-flowering plants plant groups pores trees wild	asexual reproduction erosion interdependence sexual reproduction Topography clone plantlets runners seed formation transpiration	microbes microorganism Organism Invertebrates Vertebrates Species Linnaeus system Fungi Mollusc Domains Kingdoms Species Classification Branch database

Science progression of vocabulary x

	By the end of Key Stage 1			By the end of Lower Key Stage 2			By the end of Upper Key Stage 2		
Healthy living	emotions exercise fish meat salt(y) sugar sweet taste water	activity balanced diet beans dairy fat fruit germ grains heart rate lifestyle medicine nuts pulse seafood starch	sugar vegetable		bacteria carbohydrate dietary fibre food groups hydrated hygiene infection minerals nutrition protection protein starches virus x-ray		canines cavities decay dentin enamel fluoride gums incisors molars nerves plaque pre-molars pulp-cavity tooth decay	menstrual cycle penis puberty testes vagina	carbon monoxide drugs
Evolution and inheritance								adaptation chromosomes competition DNA dominant genes evolution evolutionary change fossil records	genes inherit inheritance natural selection recessive genes species survival of the fittest
Rocks				chalk clay cobble crystals fossil grains granite granule igneous impermeable lava layers limestone magma	marble metamorphic mineral organic particles pebble permeable porous quartz sand sandstone sedimentary silt slate surface	absorb absorbent artificial characteristic chemical dissolve opaque powder reflective resources texture translucent			

Science progression of vocabulary

	By the end of Key Stage 1				By the end of Lower Key Stage 2		By the end of Upper Key Stage 2			
Everyday materials	bendy boil bright burn cloudy dim dull freeze glass hard material melt metal object plastic	rock rough see-through shiny smooth soft stiff strong water waterproof weak Wood **Transparent** **Opaque**	boiling point elastic flexible function gas heat liquid man-made molten natural pressure property purpose reflection rigid	rust solid suitable transparent transparent Useful float pull push sink squash(ing) stretch(ing) twist(ing) electricity mains		absorb absorbent artificial characteristic chemical dissolve opaque powder reflective resources texture translucent				
Properties and changes of materials							insulation insulator irreversible change mixture reaction residue	bicarbonate buoyancy change combustion conductor conductivity filter filtrate	reversible separation soluble solute solution solvent	suspension thermal helium hydrogen oxidisation solubility sublimation
States of matter					freezing point gas gaseous liquid melting point molecules	boiling point Celsius change of state condensation degree evaporation oxygen precipitation				

Science progression of vocabulary

	By the end of Key Stage 1		By the end of Lower Key Stage 2			By the end of Upper Key Stage 2	
Light			absorb block crescent moon emit gibbous moon kaleidoscope lens light beam light source	quarter moon reflect solar system spectrum speed of light sundial wane wax	light wave mirror new moon phases of moon prism	concave convex cornea iris lens optics pupil refraction retina	
Sound			amplitude auditory decibel dynamic echo frequency instruments insulation muffle	mute noise pitch pollution sound source sound wave	soundproof tone tuning fork vibrate vibration Volume transmission		
Forces and magnets			air resistance aluminium attract bar magnet brass button magnet compress copper force force-meter friction gravity horse-shoe magnet iron	magnet magnetic Newton meter nickel non-magnetic North pole repel ring magnet South pole spring steel streamlined		air resistance cams drag forces gears levers mechanisms parachute pulleys surface resistance transference water resistance	

Science progression of vocabulary

	By the end of key Stage 1				By the end of Lower Key Stage 2			By the end of Upper Key Stage 2			
Seasonal changes	autumn bright cold dark darkness day dim hot ice length light month	rain gauge rainbow seasons shadow snow spring summer sun sunlight weather moon movement Rain	April August daily December equator February fortnight January July June March May	monthly November October poles seasonal September weekly wind windsock wind vane winter Year							
Earth and Space								asteroid axis/axes celestial body comet elliptical orbit equator galaxy hemisphere Jupiter latitude light year Isphere	meteorite Neptune orbit Pluto prime Meridian revolve rotation Saturn	astronomical geocentric model of the universe heliocentric model of the universe spherical spin time zone Uranus Venus	sphere spherical spin time zone Uranus Venus
Electricity					appliances battery bulb buzzer cell circuit close circuit complete circuit	components conductor connection electrical insulator motor negative open circuit	positive resister switch symbol wire crocodile clip device	conductivity copper wire current dimmer switch fuse generator parallel circuits power resistance	socket terminal volts voltage Wire series circuits simple circuits		