Diocese of Nottingham

…working in partnership with

The Our Lady of Lourdes Catholic Trust

St Philip Neri with St Bede Catholic Voluntary Academy

Policy Document

Science

Written by:	Approved by:	Approval Date:	Review Date:
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SCIENCE POLICY

CONTEXT

Science stimulates and excites pupils' curiosity about phenomena and events in the world around them. It also satisfies this curiosity with knowledge. Because science links direct practical experience with ideas, it can engage learners at many levels. Scientific method is about developing and evaluating explanations through experimental evidence and modelling. This is a spur to critical and creative thought. Through science, pupils understand how major scientific ideas contribute to technological change – impacting on industry, business and medicine and improving quality of life. Pupils recognise the cultural significance of science and trace its worldwide development. They learn to question and discuss science based issues that may affect their own lives, the direction of society and the future of the world.

National Curriculum (NC) DFEE Qualifications Curriculum Authority (QCA) 1999 p.76

INTENT

It is our intention at St. Philip Neri with St. Bede Catholic Voluntary Academy, to develop in all young people a lifelong curiosity and interest in the sciences. When planning for the science curriculum, we intend for children to have the opportunity, wherever possible, to learn through varied systematic investigations, leading to them being equipped for life to ask and answer scientific questions about the world around them. As children progress through the year groups, they build on their skills in working scientifically, as well as on their scientific knowledge, as they develop greater independence in planning and carrying out fair and comparative tests to answer a range of scientific questions. Coverage is ensured through a whole school Long Term Plan (our Science Intent), which follows the statutory requirements of the National Curriculum. This is compiled by all teaching staff overseen by the subject leader (See Appendix 1).

AIMS OF SCIENCE EDUCATION AT ST. PHILIP NERI WITH ST. BEDE'S SCHOOL

Our teaching aims to enable children to:

- Retain and develop the children's natural curiosity in the world around them.
- Develop the skills necessary for scientific investigation including:
  Generating questions, planning fair tests, careful observation, interpreting and evaluating evidence.
- Build up a body of scientific knowledge and understanding.
- Effectively communicate scientific information.
- Develop knowledge and understanding of Health and Safety issues.

IMPLEMENTATION

HOW WE PLAN

- All planning is based on the school's Long Term Plan, which outlines our Science Intent.
- Medium Term planning has been developed for each Science unit of work. For each unit, Medium Term Planning outlines the key objective, the essential knowledge to be taught, desirable knowledge and vocabulary to be taught and used for each lesson. Units are planned as a year group team. This is completed using the National Curriculum and the school's Science Progression Document (Appendix 2).
- Collaborative planning in year groups and Foundation is encouraged as an aid to promoting continuity.
- Planning incorporates the use of Information Communication Technology (ICT) where and when appropriate. i.e. use of data-handling programs, temperature sensor, data loggers etc.
- In line with the school's Monitoring and Evaluation Schedule, the Science Leader will periodically scrutinse planning to ensure full relevant and effective coverage of the National Curriculum.

SCIENCE INVESTIGATIONS

- From Year 1 - Year 6, each unit of learning will include two investigations following the school science investigation proforma (see Appendix 3). Upper KS2 pupils will record the investigation directly into their science books using the same format.
- Foundation Stage children will complete one adult-led investigation per term.
- Investigations will be a mixture of adult led and child-led investigations.
- Adult-led investigations give the teacher opportunity to model how an investigation should be carried out.
- Child-led investigations give pupils the opportunity to apply this learning independently.

SCIENCE LESSONS

- Science is incorporated into Foundation Stage teaching of 'Knowledge and Understanding of the World Around Us'.
- Key Stage 1 children receive a minimum of 1 hour science teaching a week.
- Key Stage 2 children receive an average of 2 hours science teaching a week.
- From Year 1 upwards, all units of learning begin with a pre-learning to assess current knowledge; this is then reassessed at the end of a unit using post learning.
- RAG-rated marking is completed in line with our Marking Policy and where a child receives either an amber or red dot, further teaching will be put in place either through the next lesson, individual challenges or impact sessions.

SCIENCE IN THE WIDER CURRICULUM

- Opportunities are provided for children to see science at work in the world around us through focus days, for example International Women in Science Day, UK Science Week, and Trust-led science competitions.

EQUAL OPPORTUNITIES

All children should be given the opportunity to experience a curriculum that ensures different learning activities to meet their individual needs. Careful planning ensures all children work towards achieving their potential regardless of race, culture, gender or special need.

RESOURCES

Resources are sufficient to ensure effective implementation of the National Curriculum and are centrally resourced in in the science cupboard. Teachers are regularly asked if they require further resources to help with the effective teaching and assessment of science. All teachers take responsibility for borrowing and returning equipment.

IMPACT

ASSESSMENT

In accordance with the assessment policy:

Formative assessment will take place through:

- Key questions with an appropriate level of challenge
- Observation
- Marking of work using RAG rating
- Self-assessment
- Pre/post learnings
- Assessing scientific enquiry through science investigations.

Children's progress is reported termly onto OTrack and on in the annual report to parents.

ROLES AND RESPONSIBILITIES

The Headteacher has overall responsibility for the delivery of the National Curriculum that includes Science, to ensure the policy complies with legal requirements and is delivered effectively.

The Science Leader, Mrs R. Taylor has, under the direction of the Headteacher, overall responsibility for the Science curriculum that includes:

- Promotion of science within school;
- To advise re resources and ordering of resources;
- To arrange, plan and deliver INSET/ staff meetings;
- To ensure implementation of the subject through regular consultation with colleagues;
- To use a variety of methods of monitoring to ensure effective delivery of the science curriculum;
- Analysis of all relevant data to inform future planning.

THIS POLICY IS FOR ALL PUPILS REGARDLESS OF RACE, GENDER, ABILITY OR DISABILITY.

APPENDIX 1: St. Philip Neri with St. Bede's **Science Intent** 2022 – 2023

	Advent 1	Advent 2	Lent 1	Lent 2	Pentecost 1	Pentecost 2
Year 1	Animals Inc. Humans		Everyday Materials		Plants	Seasonal Changes
Year 2	Animals Inc. Humans .	Use of Everyday Materials	Plants	Living Things and their Habitats		Consolidation of Science taught in KS1
Year 3	Light	Rocks and Soils	Forces and Magnets	Plants	Animals Inc. Humans	
Year 4	Living Things and their Habitats	Animals Inc. Humans	States of Matter	Sound	Electricity	Consolidation of Science taught in KS1
Year 5	Micro-Organisms	Earth and Space	Living Things and their Habitats	Animals Inc. Humans	Properties and Changes of Materials	Forces
Year 6	Animals Inc. Humans	Electricity	Living Things and their Habitats	Evolution and Inheritance	Light	Consolidation of Science taught in KS2

Animals, including Humans	PROGRESSION OF KNOWLEDGE					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	Pupils should be taught to: • 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 • describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets) • identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat • identify that humans and some other animals have skeletons and muscles for support, protection and movement.	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • describe the changes as humans develop to old age.	**Pupils should be taught to:** • identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • describe the ways in which nutrients and water are transported within animals, including humans.
When covered	• Advent 1 and 2	• Advent 1	• Pentecost 1 and 2	• Advent 2	• Lent 2	• Advent 1

Essential Vocabulary	**Vocabulary taught and used must include:** Amphibian; reptile; bird; mammal; diet; teeth; carnivore; omnivore; herbivore; protection; camouflage; prey; predator; touch; smell; taste; sight; hear; senses; human body; head; neck; arms; elbows; legs; knees; face; ears; eyes; hair; mouth; teeth; group; sort; classify	**Vocabulary taught and used must include:** Lifecycle; live young; egg; baby; toddler; child; adult; birth; death; parent; healthy; exercise; diet; balanced; hygiene; food; offspring; survival; protein; carbohydrate; fat; nutrition; dairy; fruit; vegetable	**Vocabulary taught and used must include:** Starch; carbohydrate; fat; oil; dairy; protein; fruit; vegetable; balanced; nutrition; energy; omnivore; carnivore; herbivore; consumer; muscle; predator; producer; prey; skeleton; bones; invertebrate; vertebrate; support; protection; movement	**Vocabulary taught and used must include:** Mouth; teeth; incisor; molar; pre molar; canine; filling; tooth decay; plaque; jaw; digestion; digestive system; chew; saliva; nutrition; oesophagus; stomach, small intestine; faeces (poo); predator, prey, producer, food chain	**Vocabulary taught and used must include:** Life cycle; gestation; foetus; baby; child; adolescent; adult; old age; growth; comparison; development; mental; physical; hygiene; health	**Vocabulary taught and used must include:** Arteries; blood vessels; blood pressure; capillaries; heart; pump; oxygen; carbon dioxide; lungs; nutrients; water; circulation; circulatory system; platelet; plasma; red blood cells; white blood cells; transfusion; vein; pulse; exercise; diet; drugs; alcohol; prevention; cure; misuse
Diversity Links	Know about different animals in various other countries around the world and compare these to the animals found where we live.	To know about women in science - zoology, e.g. Jane Goodall, Terri Irwin.				

	PROGRESSION OF KNOWLEDGE					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Plants	**Pupils should be taught to:** • 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	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • 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.			
When covered	• Pentecost 1	• Lent 1	• Lent 2			

Essential Vocabulary	**Vocabulary taught and used must include:** Plant; tree; deciduous; evergreen; trunk; leaf/leaves; branches; roots; stem; petals; flower; leaf; conditions; seed; bulb; pollen.	**Vocabulary taught and used must include:** Leaf/leaves; stem; roots; petals; light; soil; water; seed; bulb; temperature; healthy; thrive; plant; conditions; light; dark; water; shade; food; temperature; seed; grow.	**Vocabulary taught and used must include:** Germination; pollination; dispersal; life cycle; attract; fertilisation; reproduction; root; stem; leaf/leaves; flower; transported; seed; nutrient; formation; function; requirement; thrive.			
Diversity Links	Know about different plants in various other countries around the world and compare these to the plants found where we live.	Consider how plants are grown in different countries around the world and how this benefits that country.	Study George Washington Carver, a black botanist who developed a method for soil depletion.			

Living Things and their Habitats	PROGRESSION OF KNOWLEDGE					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
		Pupils should be taught to: • 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 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.		**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • 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.	**Pupils should be taught to:** • 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 • give reasons for classifying plants and animals based on specific characteristics.

When covered		• Lent 2 and Pentecost 1		• Advent 1	• Lent 1	• Lent 1
Essential Vocabulary		**Vocabulary taught and used must include:** Life cycle; minibeast; invertebrates; food chain; habitat; micro-habitat; alive; dead; plants; mammals; reptiles; amphibians; carnivore; herbivore; omnivore; grouped; classify; prey; predator; source; consumer; energy; survival; diet; hygiene; camouflage; exercise		**Vocabulary taught and used must include:** Alive; dead; never been alive; movement; growth; reproduction; sensitive; excrete; respire; nutrition; habitat; vertebrate; invertebrate; mammal; insect; amphibian; fish; reptile; bird; classify; group; similar; different; variety; key; branching data base; environment; feature	**Vocabulary taught and used must include:** Anther; filament; stem; ovule; style; stigma; petal; pollen; pollination; pollinator; tube; germination; leaf; stem; roots; petals; light; soil; water; seed; bulb; temperature; healthy; micro-organisms; fungi; bacteria; viruses sexual; asexual; fertilisation; reproduction; offspring; metamorphosis; amphibian; insect; transform; larvae; pupa; nymph; egg.	**Vocabulary taught and used must include:** Antarctic; Arctic; freeze; habitat; biodiversity; ecosystem; dense; insulate; inhibit; classification; kingdom; phylum; genus; species; order; family; group; sub group; Linnaeus; opinion; support; refute; similarities; differences; plants; animals; organism, microorganism; taxonomy.
Diversity Links				Consider dangers to animals in different countries across the world and link this to the culture of that country		

(Use of) Everyday Materials (including Rocks) Properties and Changes of Materials	PROGRESSION OF KNOWLEDGE					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	Pupils should be taught to: • distinguish between an object and the material from which it is made • identify and name a variety of everyday materials, including wood, plastic, glass, metal, 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 simple physical properties	**Pupils should be taught to:** • identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses • find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.	***Rocks*** **Pupils should be taught to:** • 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.	***States of Matter*** **Pupils should be taught to:** • 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.	**Pupils should be taught to:** • compare and group together everyday materials on the basis of their properties, including their hardness, solubility, transparency, conductivity (electrical and thermal), and response to magnets • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • demonstrate that dissolving, mixing and changes of state are reversible changes	

					• explain that some changes result in the formation of new materials, and that this kind of change is not usually reversible, including changes associated with burning and the action of acid on bicarbonate of soda.	
When covered	• Lent 1 and 2	• Advent 2	• Advent 2	• Lent 1	• Pentecost 1	
Essential Vocabulary	**Vocabulary taught and used must include:** Material; man-made; natural; plastic; wood; metal; fabric; ceramic; paper; rough; smooth; magnetic; non-magnetic; hard; soft; bendy; flexible; rigid; strong; brittle; breakable; weak; sort; group; compare; different; properties; opaque; transparent; waterproof	**Vocabulary taught and used must include:** Permanent; change; bend; fold; squash; flexible; rigid; solid; rough; smooth; waterproof; transparent; strong; brittle; breakable; opaque; glue; natural; stickier; absorbent; consistency; flexible; compare; describe; properties; suitable	**Vocabulary taught and used must include:** Compression; fossil; soil; organic matter; topsoil; subsoil; base rock; bedrock; cast fossils; trace fossils; metamorphic; sedimentary; humus; parent material; permeable; impermeable; hard; soft; slate; chalk; marble; sandstone; properties	**Vocabulary taught and used must include:** Solid; liquid; gas; state; degrees; Celsius; solidifying point; boiling point; particles; melting; freezing; heating; cooling; viscosity; water cycle; precipitation; condensation; evaporation; collection; temperature; thermometer; ice; rain; clouds; vapour; precipitation	**Vocabulary taught and used must include:** Dissolve; soluble; solute; insoluble; solution; reversible; irreversible; suspension; state; material; conductivity; transparency; thermal evaporation; filtering; melting; separate; reaction; liquid; substance; gases; sieving	
Diversity Links			Study Kusala Rajendran, an Asian female scientist studies earthquakes and their patterns.	Look at different physicists in this field. Link back to International Day of Women and Girls in Science		

Forces and Magnets	PROGRESSION OF KNOWLEDGE					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
			Forces and magnets **Pupils should be taught to:** • 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.		***Forces*** **Pupils should be taught to:** • 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.	

When covered			• Lent 1		• Pentecost 2	
Essential Vocabulary			**Vocabulary taught and used must include:** Pole; force; magnetic; magnetism; attract; repel; force; force meter; gravity; natural; pull; push; friction		**Vocabulary taught and used must include:** Earth; force; air resistance; water resistance; buoyancy; load; gravity; up thrust; exert; friction; balancing; Newton; variable; levers; pulleys; fulcrum; position; loads; weight; gear; mechanisms	
Diversity Links			Look at female physicists in this field, e.g. Katherine Johnson Look at Stephen Hawking and his contributions to science.			

Seasonal Changes & Earth and Space	PROGRESSION OF KNOWLEDGE					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
	Seasonal Changes **Pupils should be taught to:** • observe changes across the 4 seasons • observe and describe weather associated with the seasons and how day length varies.				***Earth and Space*** **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.	
When covered	• Pentecost 2				• Advent 2	

Essential Vocabulary	**Vocabulary taught and used must include:** Autumn; winter; spring; summer; seasons; weather; month; year; January; February; March; April; May; June; July; August; September; October; November; December; wind; rain; snow; fog; cloud; sleet; hail; months; daylight; weather patterns;				**Vocabulary taught and used must include:** Orbit; elliptical; crater; lunar; phase; satellite; axis; solar system; universe; Earth; planets; Sun; Moon; sphere/spherical; rotate; rotation; spin; night; day; opinion/fact; support/refute; Mercury; Venus; Mars; Jupiter; Saturn; Uranus; Neptune; Pluto; geocentric; heliocentric model	
Diversity Links	Know about the climate in some other countries around the world.				Look at Mae C Jemison, the first black woman in space. Katherine Johnson – her calculations enabled humans to fly to space but her opportunities were limited as a black woman. Neil DeGrasse Tyson – encouraged space exploration, one of the few African-Americans in this field.	

	PROGRESSION OF KNOWLEDGE					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Light			**Pupils should be taught to:** **Pupils should be taught to:** • 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 an opaque object • find patterns in the way that the size of shadows change			**Pupils should be taught to:** • 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.
When covered			• Advent 1			• Pentecost 1

Essential Vocabulary			**Vocabulary taught and used must include:** Shadow; source; opaque; transparent; reflector; natural			**Vocabulary taught and used must include:** Light source; concave; convex; filter; lens; optical; voltage; cladding; transmit; circuit; internal reflection; optical fibres; retina; cornea; iris; pupils; refracts
Diversity Links						Consider women in Electricity as well as the likes of Thomas Edison and Nikola Tesla.

	PROGRESSION OF KNOWLEDGE					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Electricity				**Pupils should be taught to:** • 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.		**Pupils should be taught to:** • 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

When covered				• Pentecost 1		• Advent 2
Essential Vocabulary				**Vocabulary taught and used must include:** Conductor, insulator, current, cell, battery, wire, bulb, motor, buzzer, circuit; switch; electricity; mains; power stations; power lines; pylons; safety; power grid; circuit		**Vocabulary taught and used must include:** Electric current; alternating current; direct current; battery; cell; bulb; switch; motor; buzzer; circuit; voltage; brightness; volume; component; symbols; diagram
Diversity Links						Consider women in Electricity as well as the likes of Thomas Edison and Nikola Tesla.

	PROGRESSION OF KNOWLEDGE					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Sound				**Pupils should be taught to:** • 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		
When covered				• Lent 2		

Essential Vocabulary				**Vocabulary taught and used must include:** Vibration; sound waves; waves; pitch (high and low); sound proof; volume; amplify; insulate; ear drum; ear canal; travel; solids; gases; hearing loop; subtitles; hearing aids; hearing impairment		
Diversity Links				Make reference to Walter Lincoln Hawkins, a black scientist who made universal service in phones available.		

	PROGRESSION OF KNOWLEDGE					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Evolution and Inheritance						**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.
When covered						• Lent 2
Essential Vocabulary						**Vocabulary taught and used must include:** Adaptation; artificial selection; DNA; evolution; relationships; extinct; fossil; selective breeding; inheritance; natural selection; species; trait; dominant; recessive; classification; gene; inherit; arch; chromosome; cladogram;

						characteristic; classify; genetic; molecule; fingerprint; loop; whorl; suited/suitable; vary/variation; Mary Anning; Charles Darwin; Alfred Wallace;
Diversity Links						Link to different genetics and DNA across different groups of people. Look at Rosalind Franklin, a female English scientist who worked with DNA.

PROGRESSION OF SKILLS

	KS1	Lower KS2	Upper KS2
Working Scientifically	During years 1 and 2, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking simple questions and recognising that they can be answered in different ways; • observing closely, using simple equipment; • performing simple tests; • identifying and classifying; • using their observations and ideas to suggest answers to questions; • gathering and recording data to help in answering questions.	During years 3 and 4, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • asking relevant questions and using different types of scientific enquiries to answer them; • setting up simple practical enquiries, comparative and fair tests; • making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers; • gathering, recording, classifying and presenting data in a variety of ways to help in answering questions; • recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables; • reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions; • using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions; • identifying differences, similarities or changes related to simple scientific ideas and processes; • using straightforward scientific evidence to answer questions or to support their findings.	During years 5 and 6, pupils should be taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content: • 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; • using test results to make predictions to set up further comparative and fair tests; • reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations; • identifying scientific evidence that has been used to support or refute ideas or arguments.

PROGRESSION OF SKILLS

	KS1	Lower KS2	Upper KS2
Observing and Measuring Changes	**KS1 Science National Curriculum** Observing closely, using simple equipment. Children can: a observe the natural and humanly constructed world around them; b observe changes over time; c use simple measurements and equipment; d make careful observations, sometimes using equipment to help them observe carefully.	**Lower KS2 Science National Curriculum** Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers. Children can: a make systematic and careful observations; b observe changes over time; c use a range of equipment, including thermometers and data loggers; d ask their own questions about what they observe; e where appropriate, take accurate measurements using standard units using a range of equipment.	**Upper KS2 Science National Curriculum** Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate. Children can: a choose the most appropriate equipment to make measurements and explain how to use it accurately; b take measurements using a range of scientific equipment with increasing accuracy and precision; c take repeat readings when appropriate; d understand why we take an average in repeat readings.
Identifying, Classifying, Recording and Presenting Data	**KS1 Science National Curriculum** Identifying and classifying. Gathering and recording data to help in answering questions. Children can: a use simple features to compare objects, materials and living things; b decide how to sort and classify objects into simple groups with some help; c record and communicate findings in a range of ways with support; d sort, group, gather and record data in a variety of ways to help in answering questions such as in simple sorting diagrams, pictograms, tally charts, block diagrams and simple tables.	**Lower KS2 Science National Curriculum** 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. Children can: a talk about criteria for grouping, sorting and classifying; b group and classify things; c collect data from their own observations and measurements; d present data in a variety of ways to help in answering questions; e use, read and spell scientific vocabulary correctly and with confidence, using their growing word reading and spelling knowledge; f record findings using scientific language, drawings, labelled diagrams, keys, bar charts and tables	**Upper KS2 Science National Curriculum** Recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs. Children can: a independently group, classify and describe living things and materials; b use and develop keys and other information records to identify, classify and describe living things and materials; c decide how to record data from a choice of familiar approaches; d record data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar graphs and line graphs.

PROGRESSION OF SKILLS

	KS1	Lower KS2	Upper KS2
Drawing Conclusions, Noticing Patterns and Presenting Findings	KS1 Science National Curriculum Using their observations and ideas to suggest answers to questions. Children can: a notice links between cause and effect with support; b begin to notice patterns and relationships with support; c begin to draw simple conclusions; d identify and discuss differences between their results; e use simple and scientific language; f read and spell scientific vocabulary at a level consistent with their increasing word reading and spelling knowledge at key stage 1; talk about their findings to a variety of audiences in a variety of ways.	Lower KS2 Science National Curriculum 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. Children can: a draw simple conclusions from their results; b make predictions; c suggest improvements to investigations; d raise further questions which could be investigated; e first talk about, and then go on to write about, what they have found out; f report and present their results and conclusions to others in written and oral forms with increasing confidence.	Upper KS2 Science National Curriculum Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and a degree of trust in results, in oral and written forms such as displays and other presentations. Children can: a notice patterns; b draw conclusions based in their data and observations; c use their scientific knowledge and understanding to explain their findings; d read, spell and pronounce scientific vocabulary correctly; e identify patterns that might be found in the natural environment; f look for different causal relationships in their data; g discuss the degree of trust they can have in a set of results; h independently report and present their conclusions to others in oral and written forms.
Using Scientific Evidence and Secondary Sources of Information		Lower KS2 Science National Curriculum Identifying differences, similarities or changes related to simple scientific ideas and processes. Using straightforward scientific evidence to answer questions or to support their findings. Children can: a make links between their own science results and other scientific evidence; b use straightforward scientific evidence to answer questions or support their findings; c identify similarities, differences, patterns and changes relating to simple scientific ideas and processes; d recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	Upper KS2 Science National Curriculum Identifying scientific evidence that has been used to support or refute ideas or arguments. Children can: a use primary and secondary sources evidence to justify ideas; b identify evidence that refutes or supports their ideas; c recognise where secondary sources will be most useful to research ideas and begin to separate opinion from fact; d use relevant scientific language and illustrations to discuss, communicate and justify their scientific ideas; e talk about how scientific ideas have developed over time.

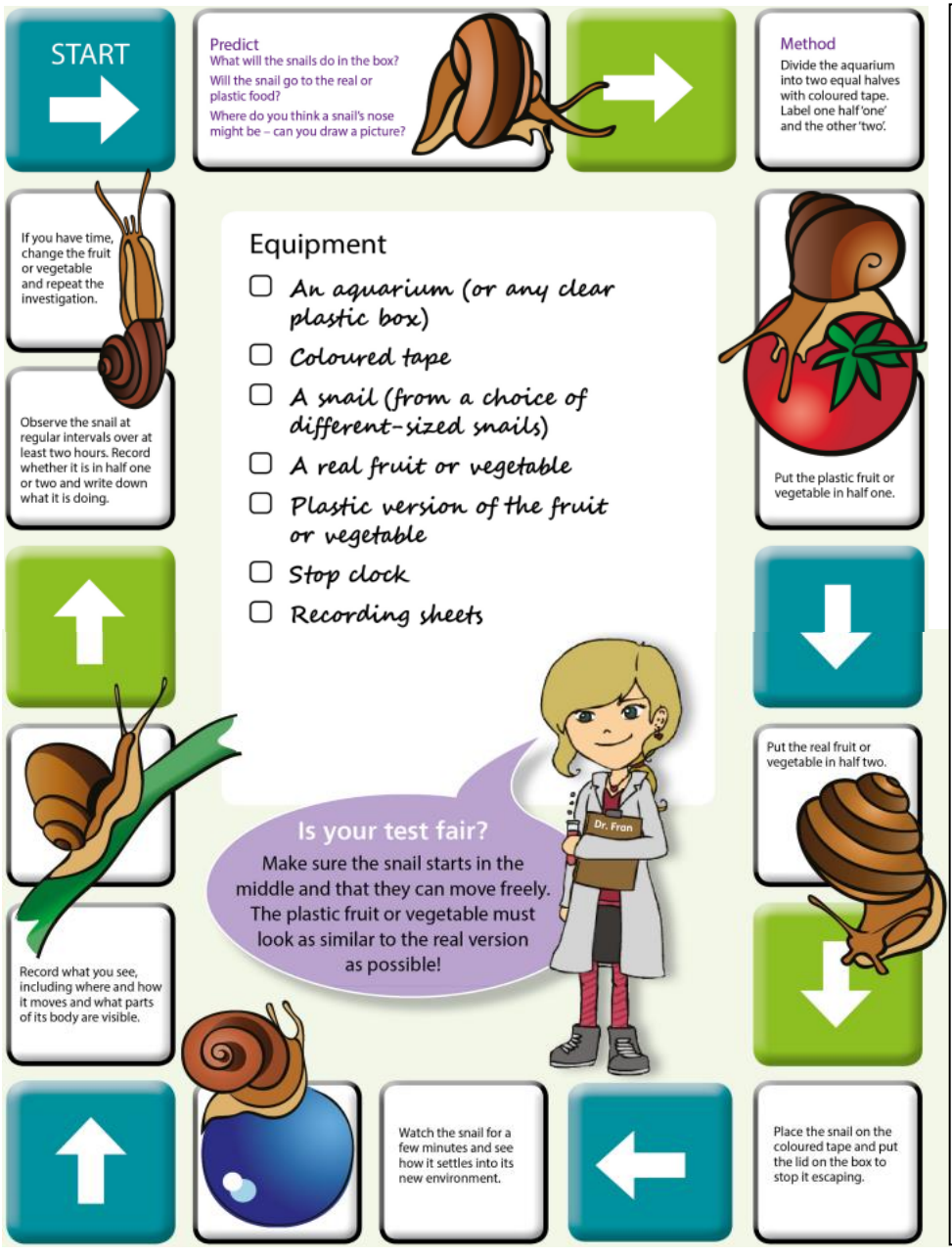
Date:

Child/Adult Led – Science Investigation

LO: pick one of the scientific enquiry skills that you are going to focus on.

Scientific Question:

Prediction: I think that…



Variables:

What I will change

-

What I will keep the same.

-
-
-
-
-

I will measure:

-

Results: