Science Progression Map

Intent

At Holy Trinity CE Academy, we believe that children should be provided with a broad, balanced and stimulating Science curriculum which enables them to confidently explore and discover what is around them, so that they have a deeper understanding of the world we live in. We want our children to love science. We want them to have no limits to what their ambitions are and to be aware of the wide range of roles that are available to them. Through our science curriculum we aim to help our children to love learning, experience the joy of discovery and develop respect for themselves and the world around them.

Implementation

In line with the national curriculum, we use carefully sequenced lessons to enable children to build on their previous knowledge and understanding. Children explore, question, predict, plan, carry out investigations and observations as well as conclude their findings.
Children present their findings and learning using science specific language, observations and diagrams.
In EYFS children explore the world around them in a variety of ways and are encouraged to use scientific vocabulary where appropriate. Their rich environment provides them with opportunities to develop their scientific knowledge and vocabulary.
At the start of each topic children will review previous learning and will have the opportunity to share what they already know about a current topic. This allows staff to adapt their planning to ensure that any misconceptions or gaps in previous learning are addressed quickly.
To support teaching, teachers access a range of resources including a range of texts and practical resources to enable children to explore the topics fully. This is supported through educational visits and visitors into school, including our established link with Northumbria University through NUSTEM.
Teachers use highly effective assessment for learning in each lesson to ensure misconceptions are highlighted and addressed.
Effective modelling by teachers ensures that children are able to achieve their learning objectives, with misconceptions addressed within it and through effective feedback and marking.
In addition, where appropriate scientific concepts are taught through out creative curriculum topics to allow children to revisit previous learning and to allow them to apply their scientific knowledge in a different context.

Impact

The impact of whole school science will be seen through good progress over time, across key stages, relative to a child's individual starting point and their progression of skills. Through various workshops, trips and interactions with experts our science curriculum will lead pupils to be enthusiastic science learners and understand that science has changed our lives and that it is vital to the world's future prosperity. We want to empower our children so they understand they have the capability to change the world. This is evidenced in a range of ways, including pupil voice, their work and their overwhelming enjoyment for science.

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End of EYFS Expectations (ELG)
• Make comments about what they have heard and ask questions to clarify their understanding • Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices. • 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 some important processes and changes in the natural world around them, including the seasons and changing states of matter.

Key Stage 1 National Curriculum Expectations	Key Stage 2 National Curriculum Expectations

Working scientifically
The pupil can, using appropriate scientific language from the national curriculum:
• ask their own questions about what they notice
• use different types of scientific enquiry to gather and record data, using simple equipment where appropriate, to answer questions
  ○ observing changes over time
  ○ noticing patterns
  ○ grouping and classifying things
  ○ carrying out simple comparative tests
  ○ finding things out using secondary sources of information
• communicate their ideas, what they do and what they find out in a variety of ways
	Working scientifically
	The pupil can, using appropriate scientific language from the national curriculum:
	• describe and evaluate their own and others' scientific ideas related to topics in the national curriculum (including ideas that have changed over time), using evidence from a range of sources
	• ask their own questions about the scientific phenomena that they are studying, and select the most appropriate ways to answer these questions, recognising and controlling variables where necessary (i.e. observing changes over different periods of time, noticing patterns, grouping and classifying things, carrying out comparative and fair tests, and finding things out using a wide range of secondary sources)
	• use a range of scientific equipment to take accurate and precise measurements or readings, with repeat readings where appropriate
	• record data and results using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs
	• draw conclusions, explain and evaluate their methods and findings, communicating these in a variety of ways
	• raise further questions that could be investigated, based on their data and observations.

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Science content The pupil can:	Science content The pupil can:
• name and locate parts of the human body, including those related to the senses and describe the importance of exercise, a balanced diet and hygiene for humans • describe the basic needs of animals for survival and the main changes as young animals, including humans, grow into adults • describe the basic needs of plants for survival and the impact of changing these and the main changes as seeds and bulbs grow into mature plants • identify whether things are alive, dead or have never lived • describe and compare the observable features of animals from a range of groups • group animals according to what they eat • describe how animals get their food from other animals and/or from plants, and use simple food chains to describe these relationships • describe seasonal changes • name different plants and animals and describe how they are suited to different habitats • distinguish objects from materials, describe their properties, identify and group everyday materials and compare their suitability for different uses	• name and describe the functions of the main parts of the digestive , musculoskeletal and circulatory systems; and describe and compare different reproductive processes and life cycles in animals • describe the effects of diet, exercise, drugs and lifestyle on how the body functions • name, locate and describe the functions of the main parts of plants, including those involved in reproduction and transporting water and nutrients • use the observable features of plants, animals and micro-organisms to group, classify and identify them into broad groups, using keys or other methods • construct and interpret food chains • describe the requirements of plants for life and growth; and explain how environmental changes may have an impact on living things • use the basic ideas of inheritance, variation and adaptation to describe how living things have changed over time and evolved; and describe how fossils are formed and provide evidence for evolution • group and identify materials, including rocks, in different ways according to their properties, based on first-hand observation; and justify the use of different everyday materials for different uses, based on their properties • describe the characteristics of different states of matter and group materials on this basis; and describe how materials change state at different temperatures, using this to explain everyday phenomena, including the water cycle • identify and describe what happens when dissolving occurs in everyday situations; and describe how to separate mixtures and solutions into their components • identify, with reasons, whether changes in materials are reversible or not

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	• use the idea that light from light sources, or reflected light, travels in straight lines and enters our eyes to explain how we see objects, and the formation, shape and size of shadows • use the idea that sounds are associated with vibrations, and that they require a medium to travel through, to explain how sounds are made and heard • describe the relationship between the pitch of a sound and the features of its source; and between the volume of a sound, the strength of the vibrations and the distance from its source • describe the effects of simple forces that involve contact (air and water resistance, friction) that act at a distance (magnetic forces, including those between like and unlike magnetic poles), and gravity • identify simple mechanisms, including levers, gears and pulleys, that increase the effect of a force • use simple apparatus to construct and control a series circuit, and describe how the circuit may be affected when changes are made to it; and use recognised symbols to represent simple series circuit diagrams • describe the shapes and relative movements of the Sun, Moon, Earth and other planets in the solar system; and explain the apparent movement of the sun across the sky in terms of the Earth's rotation and that this results in day and night.

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Holy Trinity CE Academy Progression Document EYFS			
	3 and 4 years	Reception Children	ELG
Communication and language	• Understand 'why' questions, like: "Why do you think the caterpillar got so fat?"	• Learn new vocabulary. • Ask questions to find out more and to check what has been said to them. • Articulate their ideas and thoughts in well-formed sentences. • Describe events in some detail. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. • Use new vocabulary in different contexts.	• Make comments about what they have heard and ask questions to clarify their understanding.
Personal, Social and Emotional Development	• Make healthy choices about food, drink, activity and toothbrushing.	• Know and talk about the different factors that support their overall health and wellbeing: ○ regular physical activity ○ healthy eating ○ toothbrushing ○ sensible amounts of 'screen time' ○ having a good sleep routine	• Manage their own basic hygiene and personal needs, including dressing, going to the toilet and understanding the importance of healthy food choices.

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		○ being a safe pedestrian	
Understanding the World	• Use all their senses in hands-on exploration of natural materials. • Explore collections of materials with similar and/or different properties. • Talk about what they see, using a wide vocabulary. • Begin to make sense of their own life-story and family's history. • Explore how things work. • Plant seeds and care for growing plants. • Understand the key features of the life cycle of a plant and an animal. • Begin to understand the need to respect and care for the natural environment and all living things. • Explore and talk about different forces they can feel. • Talk about the differences between materials and changes they notice.	• Explore the natural world around them. • Describe what they see, hear and feel while they are outside. • Recognise some environments that are different to the one in which they live. • Understand the effect of changing seasons on the natural world around them.	• 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 some important processes and changes in the natural world around them, including the seasons and changing states of matter.

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Holy Trinity CE Academy Progression Document Key Stage 1 and Key Stage 2						
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Working Scientifically	Read and spell scientific vocabulary consistent with their level of word reading.	Read and spell scientific vocabulary consistent with their level of word reading.	Read and spell scientific vocabulary correctly	Read and spell scientific vocabulary correctly	Read, spell and pronounce scientific vocabulary correctly	Read, spell and pronounce scientific vocabulary correctly
	Ask simple questions and know that they can be answered in different ways (e.g. research, testing etc.)	*Ask simple questions and know that they can be answered in different ways using scientific vocabulary (e.g. research, testing etc.)*	asking relevant questions and using different types of scientific enquiries to answer them	asking relevant questions and using different types of scientific enquiries to answer them	*planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary*	*planning different types of scientific enquiries to answer their own and others questions, including recognising and controlling variables where necessary*
	Use simple equipment to observe closely. *(e.g. magnifying glasses.)*	*Use simple equipment to observe closely including changes over time.* *(e.g. growing plants with and without*	setting up simple practical enquiries, comparative and fair tests	setting up simple practical enquiries, comparative and fair tests	*taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking*	*taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking*

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		leaves over a period of weeks)			*repeat readings when appropriate*	*repeat readings when appropriate*
	Perform simple tests *(e.g. testing a property of a material, growing plants.)*	*Perform simple comparative tests* *(e.g. which conditions are best for plant growth)*	making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers (e.g. recording how the length of a shadow changes)	making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers	*recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs*	*recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs*
	Identify and classify (e.g. classify animals as herbivores, omnivores or carnivores.)	Identify, sort and classify (e.g. items, as living, never alive, and was alive)	gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	gathering, recording, classifying and presenting data in a variety of ways to help in answering questions	*using test results to make predictions to set up further comparative and fair tests*	*using test results to make predictions to set up further comparative and fair tests*

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	use observations to suggest answers to questions.	use observations to suggest answers to questions, noticing similarities, differences and patterns	recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables	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	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
	Gather and record simple data to answer questions. *(e.g. rainfall, measuring height of plants as they grow)*	*Gather and record simple data to answer questions, including from secondary sources.*	reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions	*identify scientific evidence that has been used to support or refute ideas or arguments*	*identify scientific evidence that has been used to support or refute ideas or arguments*
		use appropriate scientific language from the national curriculum to communicate *their ideas in a variety of ways, what they do and what they find out.*	using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions	using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions		group and classify things and recognise patterns (e.g. in the brightness of a bulb relative to the number of volts)

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			identifying differences, similarities or changes related to simple scientific ideas and processes	identifying differences, similarities or changes related to simple scientific ideas and processes		*Use secondary sources to find information* *(e.g. research the features used to classify animals)*
			using straightforward scientific evidence to answer questions or to support their findings.	using straightforward scientific evidence to answer questions or to support their findings.		*Use appropriate scientific vocabulary.*

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Programme of Study/ Curriculum Content	**Plants** identify and name a variety of common wild and garden plants, including deciduous and evergreen trees	**Plants** *observe and describe how seeds and bulbs grow into mature plants*	**Plants** *identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers*			

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	Plants identify and describe the basic structure of a variety of common flowering plants, including trees	**Plants** *find out and describe how plants need water, light and a suitable temperature to grow and stay healthy*	**Plants** 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			
			Plants *investigate the way in which water is transported within plants*			
			Plants *explore the part that flowers play in the life cycle of flowering plants, including pollination, seed formation and seed dispersal*			
	Animals including humans identify and name a variety of common	**Animals including humans** *notice that animals, including humans,*	**Animals including humans** identify that animals, including humans,	**Animals including humans** *describe the simple functions of the basic*	**Animals including Humans**	**Animals including Humans** *identify and name the main parts of the*

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	animals including fish, amphibians, reptiles, birds and mammals	*have offspring which grow into adults and the main changes as young, including humans grow into adults*	need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat	*parts of the digestive system in humans*	describe the changes as humans develop to old age	*human circulatory system, and describe the functions of the heart, blood vessels and blood*
	Animals including humans identify and name a variety of common animals that are carnivores, herbivores and omnivores	**Animals including humans** *find out about and describe the basic needs of animals, including humans, for survival (water, food and air)*	**Animals including humans** *identify that humans and some other animals have skeletons and muscles for support, protection and movement*	**Animals including humans** identify the different types of teeth in humans and their simple functions		**Animals including Humans** *recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function*
	Animals including Humans *describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals including pets)*	**Animals including humans** *describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene*		**Animals including humans** construct and interpret a variety of food chains, identifying producers, predators and prey		**Animals including Humans** describe the ways in which nutrients and water are transported within animals, including humans

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	Animals including Humans *identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense*					
	Materials *distinguish between an object and the material from which it is made*	**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*	**Rocks** *compare and group together different kinds of rocks on the basis of their appearance and simple physical properties*	**States of Matter** compare and group materials together, according to whether they are solids, liquids or gases	**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*	
	Materials identify and name a variety of everyday materials, including wood, plastic, glass,	**Materials** find out how the shapes of solid objects made from some materials can be changed by	**Rocks** *describe in simple terms how fossils are formed when things*	**States of Matter** *observe that some materials change state when they are heated or cooled, and measure or research*	**Materials** know that some materials will dissolve in liquid to form a solution, and describe how to recover a	

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	metal, water, and rock	squashing, bending, twisting and stretching	*that have lived are trapped within rock*	*the temperature at which this happens in degrees Celsius (°C)*	substance from a solution	
	Materials describe the simple physical properties of a variety of everyday materials		**Rocks** recognise that soils are made from rocks and organic matter	**States of Matter** *identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature*	**Materials** *use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating*	
	Materials *compare and group together a variety of everyday materials on the basis of their simple physical properties*				**Materials** give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic	
					Materials demonstrate that dissolving, mixing and changes of state are reversible changes	

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					Materials 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**	
	Seasonal Changes *observe and describe changes across the 4 seasons*	**Living Things** and **their Habitats** *explore and compare the differences between things that are living, dead, and things that have never been alive*		**Living Things and their Habitats** recognise that living things can be grouped in a variety of ways	**Living Things and their Habitats** *describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird*	**Living Things and their 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*
	Seasonal Changes *observe and describe weather associated*	**Living Things and their Habitats**		**Living Things and their Habitats**	**Living Things and their Habitats**	**Living Things and their Habitats**

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	with the seasons and how day length varies	*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*
		Living Things and their Habitats identify and name a variety of plants and animals in their habitats, including microhabitats		**Living Things and their Habitats** recognise that environments can change and that this can sometimes pose dangers to living things		**Evolution and Inheritance** recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago
		Living Things and their Habitats *describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify*				**Evolution and Inheritance** recognise that living things produce offspring of the same kind, but normally offspring vary and are

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		and name different sources of food				not identical to their parents
						Evolution and Inheritance *identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution*
			Forces and Magnets compare how things move on different surfaces	**Electricity** identify common appliances that run on electricity	**Forces** explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object	**Electricity** associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit
			Forces and Magnets notice that some forces need contact between 2 objects, but magnetic forces can act at a distance	**Electricity** construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers	**Forces** *identify the effects of air resistance, water resistance and friction, that act between moving surfaces*	**Electricity** *compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the*

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						on/off position of switches
			Forces and Magnets *observe how magnets attract or repel each other and attract some materials and not others*	**Electricity** 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	**Forces** *recognise that some mechanisms including levers, pulleys and gears allow a smaller force to have a greater effect*	**Electricity** *use recognised symbols when representing a simple circuit in a diagram*
			Forces and Magnets 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	**Electricity** recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit		
			Forces and Magnets describe magnets as having 2 poles	**Electricity** recognise some common conductors and insulators, and associate metals with being good conductors		

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			Forces and Magnets predict whether 2 magnets will attract or repel each other, depending on which poles are facing			
			Light recognise that they need light in order to see things and that dark is the absence of light	**Sound** *identify how sounds are made, associating some of them with something vibrating*	**Earth and Space** *describe the movement of the Earth and other planets relative to the sun in the solar system*	**Light** *recognise that light appears to travel in straight lines*
			Light notice that light is reflected from surfaces	**Sound** *recognise that vibrations from sounds travel through a medium to the ear*	**Earth and Space** *describe the movement of the moon relative to the Earth*	**Light** 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
			Light recognise that light from the sun can be dangerous and that	***Sound*** *find patterns between the pitch of a sound and features of the*	**Earth and Space** *describe the sun, Earth and moon as*	**Light** explain that we see things because light travels from light

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			there are ways to protect their eyes	*object that produced it*	*approximately spherical bodies*	sources to our eyes or from light sources to objects and then to our eyes
			Light recognise that shadows are formed when the light from a light source is blocked by an opaque object	***Sound*** *find patterns between the volume of a sound and the strength of the vibrations that produced it*	**Earth and Space** *use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky*	**Light** *use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them*
			Light find patterns in the way that the size of shadows change	***Sound*** *recognise that sounds get fainter as the distance from the sound source increases.*		