

<u>Ranvilles Junior School – our Science Pathway</u>

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Science Progression Overview

		Biol	ogy			Chemistry			
	Animals	Habitats	Humans	Plants	Electricity	Forces	Earth and Space	Light and Sound	Materials & States of Matter
Year 3	Animals, including humans		Animals, including humans	Plants: growth and pollination		Forces and magnets	Geology (rocks and soils)	Light and Shadow	
Year 4	Animals, including humans (digestive system)	Living things and their habitats			Electricity			Sound	States of matter
Year 5	Living things and their environments (life cycles)		Human biology			Forces	Earth and Space (our solar system)		Properties and changes of materials
Year 6	Classification of living things (animals) Evolution and Inheritance	Classification of living things (habitat / biome link)	The human body (circulation) Human reproduction Evolution and Inheritance	Classification of living things (pants) Evolution and inheritance	Electricity			Light and Reflection	

Working Scientifically Progression Overview

<u> </u>	Working Scientifically – Lower School Statements		Working Scientifically – Upper School Statements
	Year 3 and Year 4		Year 5 and Year 6
WSL1	asking relevant questions and using different types of scientific enquiries to answer them.	WSU 1	planning different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary.
WSL 2	setting up simple practical enquiries, comparative and fair tests.	WSU 2	taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.
WSL 3	making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.	WSU 3	recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs.
WSL 4	gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.	WSU 4	using test results to make predictions to set up further comparative and fair tests.
WSL 5	recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.	WSU 5	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.
WSL 6	reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.	WSU 6	identifying scientific evidence that has been used to support or refute ideas or arguments.
WSL7	using results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions.		
WSL 8	identifying differences, similarities or changes related to simple scientific ideas and processes.		
WSL 9	using straightforward scientific evidence to answer questions or to support their findings.		



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	Unit Title			Working	Scientif	ically - Y	/ear 3 an	d Year 4			Wor	king Scie	entificall	y - Year	5 and Ye	ear 6
		WSL 1	WSL 2	WSL 3	WSL4	WSL 5	WSL 6	WSL 7	WSL 8	WSL 9	WSU 1	WSU 2	WSU 3	WSU 4	WSU 5	WSU 6
	Autumn 1 Context: Animals: Movement and Nutrition		√	√	✓	√	√		✓	√	-	-	-	-	-	-
	Autumn 2 Context: Forces and Magnets	✓	✓	✓	✓	✓		✓	✓	✓	-	-	-	-	-	-
Year 3	Spring 1 Context: Rocks and Soils	✓	✓	✓	✓	✓	✓	✓		✓	-	-	-	-	-	-
Yec	Spring 2 Context: Light and Shadows	✓	✓	✓	✓	√	✓	✓	✓	✓	-	-	-	-	-	-
	Summer l Context: Plants		✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-
	Summer 2 Context: Making Connections	✓		✓	✓	√	✓	√		✓	-	-	-	-	-	-
	Autumn 1 Context: Animals including humans: digestion & food	✓	✓	√	✓	√	✓	✓	✓	✓	-	-	-	-	-	-
	Autumn 2 Context: Electricity	✓	✓	✓	✓	√	✓	✓	✓	✓	-	-	-	-	-	-
ar 4	Spring 1 Context: States of Matter	✓	✓	✓	✓	✓	✓	✓		✓	-	-	-	-	-	-
Year	Spring 2 Context: Sound and Vibrations	✓	✓	✓	✓	✓	✓	✓	√	✓	-	-	-	-	-	-
	Summer 1 Context: Classification and Changing Habitats			✓	✓	✓			✓	✓	-	-	-	-	-	-
	Summer 2 Context: Making Connections	✓	✓	✓	✓	✓	✓	✓	✓	✓	-	-	-	-	-	-
	Autumn 1 Context: Materials - Mixtures and Separations	-	-	-	-	-	-	-	-	-	✓	✓	✓		✓	
	Autumn 2 Context: Materials - Properties and Changes	-	-	-	-	-	-	-	-	-	✓	✓	✓		✓	
ar 5	Spring 1 Context: Earth and Space	-	-	-	-	-	-	-	-	-						✓
Year	Spring 2 Context: Living things and their habitats	ı	ı	ı	ı	-	ı	ı	ı	_	√	✓		✓		
	Summer 1 Context: Imbalanced Forces	I	ı	I	I	-	1	I	ı	-	√	✓	√	✓	✓	✓
	Summer 2 Context: Making Connections	-	-	-	-	-	-	-	-	-						
	Autumn 1 Context: Classification	-	-	-	-	-	1	-	-	_			✓			✓
	Autumn 2 Context: Light and Reflection	-	-	-	-	-	-	-	-	-	√	√	√	√	✓	✓
ar 6	Spring 1 Context: Evolution and Inheritance	-	-	-	-	-	-	-	-	-	√		✓	√	✓	✓
Year	Spring 2 Context: Electricity	-	-	-	-	-	-	-	-	-	✓	√	✓	√	✓	✓
	Summer 1 Context: Animals including humans: circulation	-	-	-	-	-	-	-	-	-	✓	√	✓	✓	✓	✓
	Summer 2 Context: Making Connections	-	-	-	-	-	-	-	-	-	✓	✓	✓	✓	✓	✓



<u>Ranvilles Junior School – the Science Pathway – Year 3</u>

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	Focus The contextual focus for the pu	upils' learning.	Purpose The importance curriculum.	ee of the topic in our		inks r s ' star illustrates where there a ledge and understanding in exp			
	Autumn 1 Context: Animals: Movand Nutrition	/ement	and understar before looking	relop the children's knowledge nding of the human body, at the various nutritional ans to what makes a	Making a difference as an individual is more important than as team.				
	Step 1 Step 2			Step 3	Step 4	Step 6			
	To explain the role of a skeleton. Working scientifically: To group animals based on their physical properties. To recognise bones in the Working scient measure and second sec		body. tifically: To	To explain how muscles are used for movement.	To explain how food is an essential energy source for animals. Working scientifically: To gather and compare data to answer questions.	To identify the main nutrient groups and their simple functions. Working scientifically: To record information using secondary sources.	To explain what makes a balanced diet.		
	Autumn 2 Context: Forces and M	Addititiz		lore the forces that affect our exploring the different ects and uses of magnets.	Making a positive cor not mine.	ntribution in the world i	is your responsibility,		
	Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		
	To describe the effects of contact forces. Working scientifically: To label a diagram using arrows and scientific vocabulary.	To recognise and uses of t Working scient write a scientif identifying cau	forces. tifically: To fic conclusion	To recognise the effects and uses of forces. Working scientifically: To write a scientific conclusion identifying cause and effect.	To describe the effects of magnets. Working scientifically: To write a method.	To compare the properties of different types of magnets. Working scientifically: To display data using a bar chart.	To explain the uses of magnets. Working scientifically: To research the uses of magnets.		
	Spring 1 Context: Rocks and Soils		In order to explore the physical properties of our planet through investigating rocks, before exploring how fossils and soils have been created over time.		What we have achieved in this century is more significant the the past.				
	Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		
Year 3	To group rocks using their appearance. Working scientifically: To observe the appearance of rocks closely, using a magnifying glass. To group rock their physical properties. Working scient To make prediscipled suggest improduce explain observatime.		tifically: ctions, ovements and	To describe the process of fossil formation. Working scientifically: To present research on fossil formation.	To identify fossils and group rocks accordingly. Working scientifically: To use the fossil record to answer questions about the past.	To compare soils and how they were formed. Working scientifically: To record the drainage rate for different soils in a bar chart.	To describe a soil sample using sedimentation. Working scientifically: To draw and label a diagram.		
	Spring 2 Context: Light and Sho	adows	and understar shadows are r apply their kno	relop the children's knowledge nding of light and how made and change, before they owledge to a 'Big Problem' in shadow puppet show.	What is more important, physical, social, emotional or me well-being?				
	Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		
	To explain the role of light sources. Working scientifically: To plan and draw a results table. To compare reflecting or surfaces.		•	To recognise which materials cast a shadow. Working scientifically: To ask testable questions and plan how to answer them.	To summarise how shadows change throughout the day. Working scientifically: To evaluate a method.	To investigate how the distance of the light source affects the size of its shadow. Working scientifically: To find patterns in data and form conclusions.	To tell a story using shadow puppets.		
	Summer 1 Context: Plants Unit available from April 2024				Embracing diversity enhances understanding and appreciation of the world.				
	Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		
	Summer 2 Context: Making Connumber 2 Unit available from June 2				I'm Ok – You're OK! D	ifferences are good.			
	Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		



<u>Ranvilles Junior School – the Science Pathway – Year 4</u>

Be you Explore Execl

Focus The contextual focus for the p	upils' learning.	Purpose The important curriculum.	ce of the topic in our	Our SMSC 'Big Debate' Links The purple 'Ambitious Learners' star illustrates where there are planned focus links to support the children's knowledge and understanding in exploring 'The Big Debate'. Identity and self-worth are influenced more by change than by context and culture.				
Autumn l Context: Animals incl humans: digestion &		knowledge of human diges for our own t what this me	evelop the children's and understanding of stion, including how to care teeth, before reflecting on eans for animals and how nimals affects their					
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		
To describe the function of the human digestive system. Working scientifically: To evaluate a model.	To recognise t types of humo their roles in e	an teeth and	To explain how to care for our teeth. Working scientifically: To plan an enquiry by considering which variables should be changed, measured and controlled.	To recognise that differences in teeth relate to an animal's diet. Working scientifically: To classify animals based on their diet.	To recognise producers, predators and prey in food chains. Working scientifically: To analyse trends in line graphs and form conclusions using scientific knowledge.	To recognise that animal poo can give us clues abdigestion, teeth and diet. Working scientifically: To construct a results table for recording observations.		
Autumn 2 Context: Electricity		knowledge of electricity by	evelop the children's and understanding of r introducing them to various components.	Being powerful is mo	re important than bein	g different.		
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		
To recognise how electrical appliances are powered. Working scientifically: To record and classify qualitative data.	To construct of circuit. Working scienting draw a scienting scien	tifically: To	To explain the use of switches in a circuit.	To explain the use of materials as electrical conductors or insulators. Working scientifically: To write a method.	To investigate what affects bulb brightness. Working scientifically: To pose questions and plan ways to test them.	To explain how to be safe around electricity.		
<u>Spring 1</u> Context: States of Matter		knowledge o simple chan materials, ar	evelop the children's and understanding in the ges of properties of and how specifically water a of the three elements: gas, blid.	Keeping safe spiritually, mentally and emotionally is all our responsibility physically and online.				
Step 1 Step 2		Step 3		Step 4	Step 5	Step 6		
To identify solids using their properties. Working scientifically: To ask relevant questions about the properties of solids.	To identify liques gases using the properties. Working scient results to drawth conclusions all properties of li	neir tifically: To use v simple bout the	To describe melting and freezing. Working scientifically: To use thermometers to take accurate measurements before and after melting.	To describe condensing and evaporating. Working scientifically: To make predictions for new values about evaporation rates.	To describe the different stages of the water cycle. Working scientifically: To record the stages of the water cycle using a labelled diagram.	temperature affects evaporation rates and the water cycle. Working scientifically: To research climate change and the water cycle.		
Spring 2 Context: Sound and V	Spring 2 Context: Sound and Vibration In order knowled sound and he			We have the right to learn from our mistakes without being judged.				
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		
To describe how sounds are made. Working scientifically: To observe closely how different instruments create a sound.	To describe how sounds are made. Working scientifically: To observe closely how different instruments create To describe how heard through of mediums. Working scientifically: To research how dolphins comm		To describe the relationship between vibration strength and volume. Working scientifically: To present results using a bar chart.	To describe the relationship between volume and distance. Working scientifically: To suggest which variables to measure and for how long.	To describe pitch and how to change it. Working scientifically: To design simple results tables.	To explain how insulating materials can be used to muffle sound. Working scientifically: To identify when results or observations do not materials or or materials.		
Summer 1 Context: Classificatio Changing Habitats Unit available from April 2				Our behaviour should others.	d always positively refl	ect how we value		
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		
Summer 2 Context: Making Conr				We are all responsible	e for our environment o	and natural world to		
Unit available from June 2	024				,			
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		



<u>Ranvilles Junior School – the Science Pathway – Year 5</u>

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I_		Purpose		Our SMSC 'Big Debate' L	inks			
Focus The contextual focus for the p	upils' learning.	-	ce of the topic in our	The purple 'Ambitious Learners' star illustrates where there are planned focus links to support the children's knowledge and understanding in exploring 'The Big Debate'. Belonging - we should all be free to move between countries.				
Autumn 1 Context: Materials - Mand Separations	/lixtures	knowledge o	evelop the children's and understanding in ocesses and how materials d separate from each					
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		
To explain the sieving. Working scientifically: To research using a range of secondary resources. To explain the sieving. Working scien draw and ann diagram to exconcept.		tifically: To otate a	To explain the process of filtering. Working scientifically: To identify testable questions and how to answer them.	To describe solutions and how they can be identified. Working scientifically: To make observations about solutions.	To identify which factors affect the time taken to dissolve. Working scientifically: To plan a fair test with consideration of variables and measurements.	To describe the process of evaporation.		
Autumn 2 Context: Materials - F and Changes	Context: Materials - Properties		evelop the children's and understanding of rther, linking to their Y4 es of Matter, to reflect on als can be reversibly and changed.	Being remembered for making a difference is more important than making a difference.				
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		
To determine the hardness of materials and link this to their uses. Working scientifically: To evaluate the hardness test to determine the degree of trust in the results.	o determine the hardness i materials and link this to deir uses. To determine the transparency of different materials and link this to their uses. Valuate the hardness test of determine the degree of plan and draw a table of		To determine the conductivity of different materials and link this to their uses. Working scientifically: To write a detailed, organised method which is easy to follow.	To demonstrate reversible changes. Working scientifically: To write a prediction using prior knowledge of the states of matter.	To demonstrate irreversible changes. Working scientifically: To analyse observations about rusting and use them to support a conclusion.	To demonstrate irreversible changes. Working scientifically: To measure the circumference of a balloon accurately.		
Spring 1 Context: Earth and Space		In order to develop the children's knowledge and understanding in our solar system; specifically the orbits of the Earth around the sun and moon around the Earth, and what impact this has for the human race.		Making a difference to the world is critical for the future.				
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		
To compare the contributions of Ptolemy, Alhazen and Copernicus to models of the Solar system. Working scientifically: To pose testable questions about the solar system. To describe the and shapes of bodies in our working scient develop a more represent the		f the celestial Solar System. tifically: To del to	To describe the movement of the Moon relative to the Earth. Working scientifically: To design and draw a table.	To explain the causes of day and night and the seasons. Working scientifically: To draw a diagram to explain day and night.	To devise a sundial to tell the time. Working scientifically: To calibrate and use a sundial to measure time.	To describe some uses of satellites and the problems posed by space junk. Working scientifically: To use temperature data to make predictions about climate change.		
Spring 2 Context: Living things and their habitats		In order to develop the children's knowledge and understanding in the life cycle of animals, linking to the children's knowledge of human reproduction and age from PSHE.		The voice of a child is as important and valuable as that of an adult.				
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		
To describe the life cycle of a plant, including the reproductive stage. Working scientifically: To observe and compare equivalent parts in different flowers.	To describe the life cycle of a plant, including the reproductive stage. Working scientifically: To observe and compare equivalent parts in different different many		To describe the life cycle of a bird and compare it with that of a mammal. Working scientifically: To pose questions to compare the life cycles of different birds.	To describe the life cycle of an amphibian. Working scientifically: To suggest how temperature may affect egg hatching.	To describe the life cycle of an insect and compare it with that of an amphibian. Working scientifically: To use data to describe a relationship and make predictions.	To describe asexual reproduction in plants. Working scientifically: To represent root growth over time on a line graph.		
Summer 1 Context: Imbalanced Forces Unit available from April 2024				Being financially safe is just as important as being emotionally safe.				
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		
Summer 2 Context: Making Content available from June 2				Learning together and personal growth.	d from our mistakes le	ads to significant		
Sten 1	Ston 2		Stan 2	Step 4	Step 6			
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6		



<u>Ranvilles Junior School – the Science Pathway – Year 6</u>

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		Purpose		Our SMSC 'Big Debate' Links					
Focus The contextual focus for the pu	inile' lograine	•	ce of the topic in our	The purple 'Ambitious Learne	e rs ' star illustrates where there a				
The contextual focus for the pu	ıpııs iearning.	curriculum.		to support the children's knowledge and understanding in exploring 'The Big Debate'. It is important that some personal information is in the public domain.					
Autumn 1 Context: Classification	n	knowledge a	evelop the children's and understanding in the aracteristics of animals.						
Step 1	Step 2	Step 3		Step 4	Step 6				
To explain how organisms are classified using the Linnaean system.	ganisms are classified groups using their common		To classify the warm- blooded vertebrate groups using their common characteristics.	To classify invertebrates.	To describe how the plant kingdom is organised. Working scientifically: To produce a working classification key.	To describe and classif micro-organisms.			
Autumn 2 Context: Light and Reflection		In order to develop the children's knowledge and understanding in light waves, and how these influence what we can see and how humans have learnt to manipulate these for different purposes.		Change always has a positive impact.					
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6			
To describe the pathway of light. Working scientifically: To use evidence to form conclusions.	o describe the pathway light. To describe how we see. Working scientifically: To use idence to form To describe how we see. Working scientifically: To draw scientific diagrams.		To explain how shadows change. Working scientifically: To pose questions.	To investigate what affects the angle of the reflected ray. Working scientifically: To record results as a line graph.	To explain how a periscope works.	To explore different jobs or inventions that depend on reflection.			
Spring 1 Context: Evolution and Inheritance		In order to develop the children's knowledge and understanding of theories of evolution – where did we come from, and how have the plants and animals that exist today evolved?		It is possible to break the cycle of injustice.					
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6			
To explain why there are differences within a species. Working scientifically: To group factors. To recognise th inheritance of characteristics and animals.		of tics in plants	To explain why adaptation is necessary.	To model how natural selection affects population size. Working scientifically: To evaluate the degree of trust and pose new questions for further enquiry.	To describe the theory of evolution. Working scientifically: To consider evidence used to inform theories.	To recognise evidence that can be used for evolution. Working scientifically: To consider the degree of trust in the evidence used.			
<u>Spring 2</u> Context: Electricity	*	knowledge a electricty, inc	evelop the children's and understanding of cluding how components actically for different uses of	Together we can make our world more sustainable for everyor					
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6			
To use recognised symbols for electrical components.	To predict and presults for electrical circuits.		To recognise a link between the number of components and resistance. Working scientifically: To explain results using scientific knowledge.	To identify ways to change voltage within an electrical circuit. Working scientifically: To design a results table.	To investigate how voltage affects bulb brightness. Working scientifically: To plan an enquiry.	To apply knowledge of circuits and components to a practical solution. Science in action: To recognise that scientific knowledge can solve a problem.			
Summer 1 Context: Animals including humans: circulation Unit available from April 2024				Fair trade is fair.					
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6			
Summer 2 Context: Making Connections				Every individual can leave a positive legacy.					
Unit available from June 2									
Step 1	Step 2		Step 3	Step 4	Step 5	Step 6			