## St Gabriel's Catholic Primary School – Science Progression of Skills



## Sc1: Working Scientifically

**Scientific Enquiry** describes the processes and skills pupils should be taught and use, to find out more about the world and how it works. ... - Turner et al, takes the view that: '**Science enquiry** is what children do in order to answer **scientific** questions about the world around them'

Scientific enquiry increases children's capacity to:

- Problem solve and answer questions. Rich opportunities are provided where children explore their own ideas, develop and deepen conceptual
  understanding.
- Work with independence. Thinking and reasoning is nurtured alongside a host of qualities, including resilience, determination and confidence.
- 'Be a scientist'. A necessary toolkit of practical skills is developed and added to over time.
- Communicate effectively. Technical and scientific vocabulary is learned, practised and used, as children communicate evidence in a variety of ways, often with different audiences in mind.

Observing changes over time – observations or measurements are made at regular intervals

Making **careful** observations of objects or events and how they change over time

- Long term studies of how plants and habitats change through the year (Pre School, Early Years, KS
   1)
- Taking observations of ice melting (Early Years)
- Measuring pulse rate after exercise (Year 5 a& 6)
- Noticing how shadows change throughout the day (Years 3 & 4 and 5 & 6)
- Noticing how the moon changes shape during the month (Years 5 & 6)
- Observing how mould grows on different foods (Years 5 & 6)

	Taking observations of a puddle on a hot day (Years 3 & 4)
Comparative and fair test – exploring cause and	Investigating how shadows change size (Years 3 & 4 and 5 & 6)
<u>effect</u>	<ul> <li>Investigating air resistance using parachutes (Years 5 &amp; 6)</li> </ul>
Observing or measuring the effect of <b>changing</b>	Investigating dissolving rates (Years 5 & 6)
one variable whilst keeping other potential	Investigating properties of materials (All Years)
variables the same.	
Classifying – sorting and grouping according to	Classifying rocks, plants and animals (All years)
similarities and differences	<ul> <li>Classifying living, not living, never been alive (Years 1 &amp; 2)</li> </ul>
Identify features that allow things to be organised	<ul> <li>Classifying materials including those that can be recycled (All years)</li> </ul>
into distinct groups.	<ul> <li>Using keys to identify plants and animals (Years 1 &amp; 2, Years 3 &amp; 4 and Years 5 &amp; 6)</li> </ul>
Recognise things as part of a specific group and	
name them.	
Researching – using secondary sources to find	Using keys to identify plants and animals
answers to questions	Learning what animals eat
Gathering and analysing scientific finding to	<ul> <li>Learning about the digestive system, circulatory system (KS 2)</li> </ul>
answer a question or to provide background	<ul> <li>Learning about phases of the moon, Planets (Years 5 &amp; 6)</li> </ul>
information to help explain observed events.	

Research can also show how scientists' ideas have	
changed over time as new evidence has been	
found.	
Modelling	Concrete models e.g. of the digestive system, movement of earth and Moon, circulatory system (KS)
	2)
Pattern Seeking	Do the pupils with the longest legs jump further or run faster?
To be able to work independently, pupils need to	Pupils need to be able to:
develop a set of skills that they can then use	Ask questions
whilst carrying out different types of enquiry.	Make predictions
	Decide how to carry out an enquiry
	Take measurements
	Present data
	Answer questions using data
	Draw conclusions
	Evaluate their enquiry

Key skills	Pre-School	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Asking	To begin to	To begin to	To ask simple	To suggest	In a variety of	To suggest	With support	To ask questions
Questions	answer	ask questions	questions and	some ideas and	contexts, to	relevant	begin to ask	and develop a
	questions about	to find out	recognise that	questions based	suggest	questions based	questions and	line of enquiry

	things around	information	they can be	on simple	questions and	on scientific	develop a line of	based on
(لېکا)	them, familiar	on topics that	answered in	knowledge	ideas and how	knowledge that	enquiry based on	observations of
	places, objects	interest them	different ways		to test them.	can be tested	observations of	the real world
	and people.					and suggest	the real world	
	(Who , What,	To answer	To test ideas			how to test		To know how to
	Where)	questions	suggested to			those using		turn a question
		about aspects	them and say			different types		or idea into a
		of the natural	what they think			of scientific		form that can be
		world	will happen			enquiry		tested
		(Who, What,						
		Where, Why						
		and How)						
	Pre-School	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Making		With support	To say what	To say what	To make	To make	To make	To make
Predictions		say what they	they think	they think	predictions	predictions	predictions of	predictions using
		think might	might happen	might happen.	about what will	about what will	what will happen	scientific
(t ::)		happen	with support.		happen	happen, some of	based on	knowledge and
EnT!!						which are based	scientific	understanding
						on scientific	knowledge and	
						knowledge	understanding	
	Pre-School	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Deciding how to			To say how they	To say how they	To consider	To design a fair	To plan a fair test	To decide how to
carry out an			might find out	might find out	what makes a	test.	using previous	turn ideas into a
enquiry or			about ideas and	about ideas and	fair test unfair	To plan how to	knowledge and	form that can be
investigation			questions that	questions that	or evidence	collect	understanding	tested
			they suggest	they suggest	sufficient and	sufficient		
			with support			evidence		

				To think about	with help, plan a		To identify	To identify
			To think about	and discuss	fair test	To think about	factors that need	factors that are
			and discuss	whether		why	to be taken into	relevant to a
			whether	comparisons	To think about	observations	consideration in	particular
			comparisons	and tests are	how to collect	and	different contexts	situation
			and tests are	fair or unfair	sufficient	measurements		To choose what
			fair or unfair		evidence	should be	To collect	evidence to
			with support			repeated	sufficient	collect to
							evidence to test	investigate a
						To choose what	an idea	question,
						apparatus to		ensuring the
						use and what to		evidence is
						measure (in		sufficient
						some contexts)		
								To choose what
								equipment to use
	Pre-School	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Making	To make	With support	To perform	To perform	To gather and	To gather and	To take	To make a
Measurements	simple	perform	simple tests.	simple tests.	record evidence	record evidence	measurements	variety of
	observations	simple tests.	To observe	To collect	in a variety of	in a variety of	using a range of	relevant
			closely, using	evidence to try	context to	contexts to test	scientific	observations and
		To observe	appropriate	to answer a	answer a	an idea or	equipment, with	measurements
		closely, using	senses and	question	question or test	prediction	increasing	using a range of
		appropriate	simple		an idea	based on their	accuracy and	scientific
		senses and	equipment	To observe		scientific	precision	equipment, with
		simple		closely, using	To make	knowledge and		increasing

	e.g.	To collect	senses and	careful		To make relevant	precision, taking
	magnifying	evidence to try	simple	observationsan	To make	observations	repeat readings
	glasses	to answer a	equipment.	d comparisons	systematic		where
		question			observations	To consolidate	appropriate
			To make	To take	and	measurement of	
		To make some	measurements	accurate	comparisons of	volume,	To decide when
		measurements	of length and	measurements	relevant	temperature,	observations and
		of length using	height in	of length,	features in a	time, length and	measurements
		standard and	standard and	volume of liquid	variety of	force (using	need to be
		non-standard	non-standard	and time using	contexts	Newton meters)	checked, by
		measures.	measure.	standard units			repeating, to give
				of measure and	To take	To think about	more reliable
				measuring	accurate	why observations	data.
				equipment,	measurements	and	
				effectively	of temperature,	measurements	To measure pulse
				To use a range	time and force,	should be	To solve
				of equipment,	as well as	repeated and take	problems
				including	measurements	repeat readings	involving the
				thermometers	of length using	when appropriate	calculation and
				and data	standard units		conversion of
				loggers	of measure and	To solve	units of measure,
					measuring	problems	using decimal
					equipment,	involving the	notation up to
					effectively	calculation and	three decimal
						conversion of	places where
					To use a range	units of measure,	appropriate
					of equipment,	using decimal	(Maths)
					including	notation up to	

						thermometers	three decimal	To consider how
						and data	places where	scientists have
						loggers	appropriate	combined
							(Maths)	evidence from
								observation and
							To consider how	measurement
							scientists have	with creative
							combined	thinking to
							evidence from	suggest new
							observation and	ideas and
							measurement	explanations for
							with creative	phenomena
							thinking to	
							suggest new ideas	
							and explanations	
							for phenomena	
	Pre-School	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Recording &	To present	To present	To present	To make	To gather,	To gather,	To record data	To record data
Presenting Data	some findings in	some findings	some findings in	records of	record, classify	record, classify	and results of	and results of
	simple drawings	in simple	drawings,	observations	and present	and present	increasing	increasing
	(mark making)	tables and	simple tables		data in a variety	data in a variety	complexity using	complexity using
	using ICT where	drawings	and block	To present	of ways to help	of ways to help	scientific	scientific
	relevant with	(mark	graphs using	results in	in answering	in answering	diagrams and	diagrams and
	support	making) using	ICT where	tables, drawings	questions	questions	labels,	labels,
		ICT where	relevant	and block			classification	classification
		relevant with		graphs using	To record	To record	keys, tables and	keys, tables and
		support			findings using	findings using	bar charts and	bar charts and

				ICT where	simple scientific	simple scientific	line graphs using	line graphs using
				relevant	language,	language,	ICT where	ICT where
				relevant				
					drawings,	drawings,	relevant	relevant
					labelled	labelled	_	
					diagrams, bar	diagrams,	To report and	To report and
					charts and	classification	present findings	present findings
					tables using ICT	keys, bar charts	from enquiries,	from enquiries,
					where relevant	and tables using	including	including
						ICT where	conclusions,	conclusions,
					To report on	relevant	casual	casual
					findings from		relationships and	relationships and
					enquiries,	To report on	explanations of	explanations of
					including oral	findings from	and a degree of	and a degree of
					and written	enquiries,	trust in results, in	trust in results, in
					explanations,	including oral	oral and written	oral and written
					displays or	and written	forms with some	forms
					presentations	explanations,	guidance	
					of results and	displays or		
					conclusions	presentations		
						of results and		
						conclusions		
	Pre-School	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Answering	To begin to	To recognise	To make simple	To make simple	To make	To identify	To decide	To make
Questions using	notice	similarities	comparisons	comparisons,	generalisations	simple trends	whether results	comparisons
Data	similarities and	and	and groupings	identifying	and begin to	and patterns in	support any	
	differences in	differences	that relate to	similarities and	identify simple	results	prediction	To evaluate
		between living	differences and	differences	patterns in	presented in		repeated results
			<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>	

	photos and real	things and	similarities	between living	results	tables, charts	To begin to	
	life experiences	objects	between living	things, objects	presented in	and graphs and	evaluate repeated	To identify
(탁칠)			things and	and events	tables	to suggest	results	patterns in
			objects			explanations for		results that do
				To say what	To identify	some of these	To recognise and	not appear to fit
			To say what	results will	differences,		make predictions	the pattern
			their	show	similarities or	To identify	from patterns in	
			observations		changes related	differences,	data and suggest	To identify
			show, and	To say whether	to simple	similarities or	explanations for	scientific
			whether it was	their	scientific ideas	changes related	these using	evidence that has
			what they	predictions	and processes	to simple	scientific	been used to
			expected	were supported		scientific ideas	knowledge and	support or refute
						and processes	understanding.	ideas or
							To interpret data	arguments
							and think about	
							whether it is	
							sufficient to draw	
							conclusions	
							To identify	
							scientific evidence	
							that has been	
							used to support	
							or refute ideas or	
							arguments	
	Pre-School	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6

	Pre-School	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
						new values		
						predictions for		
						To make		
						contexts		
						in some		
					new values	understanding		
					predictions for	knowledge and		
					To make	scientific		
						evidence to		
					findings	To link the		
					support their			
					them and to	prediction made		
					explanations for	supports any		
					suggest	whether it		prediction made
					questions or to	evidence to say		supports any
					answer	knowledge and		the evidence
					evidence to	scientific		To say whether
(A)				conclusions	knowledge and	begin to use	prediction made	
				and to draw	use scientific	conclusions and	match any	predictions
			they did	was found out	and begin to	drawing simple	whether these	further
			explain what	explain what	from results	shows by	indicating	and to make
Conclusions			conclusions and	knowledge to	conclusions	the evidence	conclusions	draw conclusions
Drawing			To draw simple	To use	To draw simple	To explain what	To draw	To use results to

Evaluating the		To explain what	To explain what	To explain and	To explain and	To suggest and	To suggest and
Enquiry or		they did with	they did	reflect on the	reflect on the	evaluate	evaluate
Investigation		support		investigation	investigation	explanations for	explanations for
				and say how to	and say how to	these predictions	these predictions
				improve, with	improve	using scientific	using scientific
(Part)				support		knowledge and	knowledge and
(((((((((((((((((((((((((((((((((((((((						understanding,	understanding
						with support	