Loving God in all we do

St Anne's Catholic Primary School

Science Working Scientifically Document						
Aims	The national curriculum for science aims to ensure that all pupils: • develop scientific knowledge and conceptual understanding through the specific disciplines of biology, chemistry and physics • develop understanding of the nature, processes and methods of science through different types of science enquiries that help them to answer scientific questions about the world around them • are equipped with the scientific knowledge required to understand the uses and implications of science, today and for the future.					
	Year 1	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Pattern Seeking	▪ Use recordings to talk about and describe what happened. ▪ Sequence photographs of an event / observation.	▪ With guidance, begin to notice **patterns** in their data *e.g. order their findings, sequence best to worst, say what happened over time, etc.* ▪ Recognise if **results** matched **predictions** (say if results were what they expected). ▪ Use their recordings to talk about and describe what has happened.	▪ With scaffold / support, describe and compare the effect of different factors on something *(e.g. we noticed that larger magnets are not always stronger).* ▪ With help, look for changes and simple patterns in their observations, data, chart or graph. ▪ Use their results to consider whether they met their **predictions.**	▪ Notice / find patterns in their observations and data. (Describe the effect of something on something else). *(e.g. as I lengthen the ruler I notice that the pitch gets lower).* ▪ With some independence, analyse results / observations by writing a sentence that matches the **evidence** i.e. deciding the important aspect of the result and summarising in a **conclusion** *(e.g. metals tend to be good conductors of electricity).*	▪ Describe straightforward patterns in results linking cause and effect e.g. using er or the word 'more' *(e.g. the longer, thinner shapes move through the water more quickly OR the larger the wings, the longer it takes the spinner to fall).* ▪ Look for / notice relationships between things and begin to describe these. ▪ Comment on the results and whether they **support** the initial **prediction.**	▪ Spot unexpected results that do not fit the pattern (anomalies). ▪ Identify patterns in results collected and describe them using the **change and measure variables** (causal relationships) *(e.g. as we increased the number of batteries the brightness the bulb increased.*

Research	▪ Ask people questions (e.g. an expert or hot-seating). ▪ Use simple primary and secondary sources (such as objects, books and photographs) to find things out.	▪ Talk about how useful the information source was and express opinion about findings. ▪ Make suggestions about who to ask or where to look for information. ▪ Ask people questions to help them answer their questions. ▪ Use simple and appropriate secondary sources (such as books, photographs, videos and other technology) to find things out / find answers.	Find things out using a range of secondary sources of information *(e.g. books, photographs, videos and other technology).*	▪ Make decisions about which information to use from a wide range of sources and make decisions about how to present their research. ▪ Recognise when and how secondary sources might help them to answer questions that cannot be answered through practical investigations.	▪ Find out how scientific ideas have changed / developed over time (linked to Y5 PoS). ▪ Articulate and explain findings from their research using scientific knowledge and understanding. ▪ Make decisions about which information to use from a wide range of sources.	▪ Research how scientific ideas have developed over time and had an impact on our lives. ▪ Use evidence from a variety of sources to justify their ideas ▪ Recognise which secondary sources will be most useful to research their ideas and begin to separate opinion from fact. ▪ Interview people to find out information
Observation	▪ Begin to use simple scientific language (from Y1 PoS) to talk about or **record** what they have noticed. ▪ Use observations to make suggestions and / or ask questions. ▪ Look / **observe** closely and communicate changes over time. ▪ Look / **observe** closely and communicate the features or properties of things in the real world. ▪ **Observe** closely using their senses	▪ Use simple scientific language from the Y2 PoS to talk about / **record** what they have noticed. ▪ Use observations to make suggestions and / or ask questions. ▪ **Observe** and describe simple processes / cycles / changes with several steps *(e.g. growth cycle, simple food chain, saying how living things depend on one another).* ▪ **Observe** closely and communicate with increasing accuracy the features or properties of things in the real world.	▪ Observe and record relationships between structure and function (linked to Y3 PoS). ▪ Observe and record changes /stages over time (linked to Y3 PoS). ▪ Explore / observe things in the local environment / real contexts and record observations (linked to Y3 PoS) – see 'Communicating' section also re links to vocabulary.	▪ Suggest their own ideas on a concept and compare these with what they observe / find out. ▪ Use observations to suggest what to do next. ▪ Discuss ideas and develop descriptions from their observations using relevant scientific language and vocabulary (from Y4 PoS). ▪ Observe and record relationships between structure and function or between different parts of a processes (linked to Y4 PoS). Observe and record changes / stages over time (linked to Y4 PoS).	▪ Use their developing scientific knowledge and understanding and relevant scientific language and terminology to discuss, communicate and explain their observations (incl. more abstract ideas from Y5 PoS (e.g. friction, air resistance, forces, Earth and space, reversible and irreversible changes). ▪ Evaluate their observations and suggest a further test, offer another question or make a **prediction.** ▪ Observe (including changes over time) and suggest a reason for what they notice.	▪ Use correct scientific knowledge and understanding and relevant scientific language to discuss their observations and explorations (linked to Y6 PoS). ▪ Identify changes that have occurred over a very long period of time (evolution) and discuss how changes have impacted the world. ▪ Explore more abstract systems / functions / changes / behaviours and record their understanding of these *(e.g. the relationship between diet, exercise, drugs, lifestyle and health; evolutionary changes; how light travels).*

Fair and Comparative Test	▪ With help, **carry out** a simple test / comparative test. ▪ With help, make a simple prediction or suggestion about what might happen. ▪ Begin to suggest some ideas e.g. choose which equipment to use, choose which materials to test from a selection. ▪ **Talk** about ways of setting up a test.	▪ Carry out simple comparative tests as part of a group, following a **method** with some independence. ▪ Make a simple prediction about what might happen and try to give a vague reason (even though it might not be correct). ▪ With support, make suggestions on a **method** for setting up a simple comparative test. ▪ Talk about a practical way to find answers to their questions.	▪ Help to decide about how to set up a simple **fair test** and begin to recognise when a test is not **fair.** ▪ Make a **prediction** based on everyday experience. ▪ With support / as a group, set up simple practical enquiries including comparative and **fair tests** e.g. make a choice from a list of a things (variables) to change when conducting a **fair test**. *(e.g. choose which magnets to compare and which method to use to test their strength).* ▪ As a group, begin to make some decisions about the best way of answering their questions. ▪ Find / suggest a practical way to compare things *e.g. rocks, magnets.*	▪ Carry out simple **fair tests** with increasing confidence investigating the effect of something on something else (linked to Y4 PoS). ▪ Start to make their own decisions about the most appropriate type of science enquiry they might use to answer scientific questions *(is a fair test the best way to investigate their question?)* ▪ Make a **prediction** based on the knowledge acquired from previous explorations / observations and apply it to a new situation. ▪ Explain their planning decisions and choices. ▪ Make some of the planning decisions about what to change and measure / observe. ▪ Begin to recognise when a **fair test** is necessary.	▪ Carry our **fair tests** and other investigations with increasing independence. ▪ Suggest more than one possible prediction and begin to suggest which is the most likely. Justify their reason with some knowledge and understanding of the scientific concept. ▪ Make decisions about which **variables** to change, measure and keep the same (linked to the appropriate units in the Y5 PoS). ▪ Make most of the planning decisions for an investigation. ▪ Recognise when it is appropriate to carry out a **fair test**.	▪ Predict what a graph might look like before collecting results. ▪ Make a hypothesis where they say how one thing will affect another and give a reason for their suggestion with a developing understanding of the scientific concept. ▪ Identify **variables** to change, measure and keep the same in order for a test to be **fair.** ▪ Independently plan investigations and explain planning decisions. ▪ Decide when it is appropriate to carry out a **fair test** investigation, comparative test or alternative.
Identifying and Classifying	▪ **Name** / identify common examples and some common features. ▪ With help, decide how to sort and **group** objects, materials or living things. ▪ **Name** basic features of objects, materials and living things. ▪ Say how things are similar or different. ▪ **Compare** and contrast simple observable features / characteristics of	▪ **Name / identify** common examples, some common features or different uses. ▪ **Sort** and **group** objects, materials or living things by observable and/or behavioural features. ▪ **Compare** and contrast… a variety of things [objects, materials or living things] - focusing on the similarities as well as the differences.	▪ Decide ways and give reasons for sorting, grouping, classifying, identifying things / objects, living things, processes or events based on specific characteristics. ▪ Compare and contrast and begin to consider the relationships between different things *(e.g. structures of plants, functions of plant parts, diets,*	▪ Make a simple guide to local living things. ▪ Use guides or simple keys to classify / identify [animals, flowering plants and non-flowering plants]. ▪ Use their observations to identify and classify. ▪ Begin to give reasons for these similarities and differences. ▪ Record similarities as well as	▪ Suggest reasons for similarities and differences. ▪ Compare and contrast things beyond their locality and use these similarities and differences to help to classify *(e.g. features of animals, life cycles of different living things, melting compared with dissolving, etc).* ▪ Use secondary sources of information to	▪ Recognise the importance of classification to the scientific world and form a conclusion from their sorting and classifying. ▪ Compare and contrast more complex processes, systems, functions (e.g. sexual and asexual reproduction). ▪ Construct a classification key / branching database using more than two items.

	objects, materials and living things.		*skeletons of humans and other animals, changes over time, etc.).* Record similarities as well as differences *(e.g. what do all skeletons have? as well as the differences between skeletons.*	differences and / or changes related to simple scientific ideas or processes or more complex groups of objects / living things / events *(e.g. evaporation and condensation, different food chains, different electrical circuits).*	identify and classify. ▪ Decide which sources of information (and / or equipment and / or test) to help identify and classify.	▪ Compare and contrast things beyond their locality and discuss advantages / disadvantages, pros / cons of the similarities and differences. ▪ Use *research** to identify and classify things. ▪ Use classification systems, keys and other information records [databases] to help classify or identify things.
Communicating	▪ Communicate their ideas to a range of audiences in a variety of ways. ▪ Complete a pre-constructed table / chart using picture records or simple words. ▪ Contribute to a class display. ▪ Add annotations to drawings or photographs. ▪ Begin to use some simple scientific language from Y1 PoS. ▪ **Record** simple visual representations of observations made.	▸ **Record** and communicate their findings in a range of ways to a variety of audiences. ▸ Use simple scientific language with increasing accuracy (from Y2 PoS). ▸ **Record** simple data with some accuracy to help in answering questions; – With support or using frameworks, make decisions about how to complete a variety of tables/charts *(e.g. a 2 column table, tally charts, Venn diagram, pictograms, block graphs with 1:1 scale).* – *Present findings in a class displays.* – *Sequence / annotate photographs of change over time.* – *Produced increasingly detailed drawings which are labelled / annotated.*	– Record and present findings using simple scientific language and vocabulary from the Y3 PoS, *including discussions, oral and written explanations, notes, annotated drawings, pictorial representations, labelled diagrams, simple tables, bar charts (using scales chosen for them), displays or presentations.* – With scaffold / support record, and present data in a variety of ways to help in answering questions. – Communicate their findings in ways that are appropriate for different audiences. (linked to Y3 PoS).	– Record findings using relevant scientific language and vocabulary (from Y4 PoS), including discussions, oral and written explanations, notes, drawings (annotated), pictorial representations, labelled diagrams, tables and bar charts [where intervals and ranges agreed through discussion], displays or presentations. – Begin to select the most useful ways to collect, record, classify and present data from a range of choices. – Make decisions on how best to communicate their findings in ways that are appropriate for different audiences.	▪ Use their developing scientific knowledge and understanding and relevant scientific language and terminology to communicate more abstract concepts (linked to Y5 PoS). ▪ Present and explain their findings through talk, in written forms or in other ways (e.g. using technology) for a range of audiences / purposes. ▪ Record data and results of increasing complexity using different formats e.g. tables, annotated scientific diagrams, classification keys, graphs and models. ▪ Make decisions about the most appropriate way of recording data.	▪ Articulate understanding of the concept using scientific language and terminology when describing abstract ideas, observations and findings (linked to the Y6 PoS). ▪ Record data and results of increasing complexity using scientific diagrams and labels, recognised symbols, classification keys, tables, bar and line graphs, and models. ▪ Make decisions about how to present and explain their findings through talk, in written forms or in other ways (e.g. using technology).

Questioning	▪ Ask simple questions about what they notice about the world around them. ▪ Demonstrate curiosity by the questions they ask.	▪ Raise their own logical questions based on or linked to things they have observed. ▪ With help / scaffolds, begin to ask questions such as 'What will happen if…?"	▪ Explore their own ideas about 'what if….?' scenarios e.g. humans did not have skeletons. ▪ Ask questions such as 'What if we tried….? or 'What if we changed…?' ▪ Begin to understand that some questions can be tested in the classroom and some cannot. ▪ Within a group suggest questions that can be explored, observed, tested or investigated further. ▪ Within a group suggest relevant questions about what they observe and about the world around them.	▪ Ask / raise their own relevant questions with increasing confidence and independence that can be explored, observed, tested or investigated further. ▪ Ask questions such as 'What will happen if…?" or 'What if we changed…? (linked with Y4 PoS). ▪ Choose / select a relevant question that can be answered [by research or experiment / test].	▪ Recognise scientific questions that do not yet have definitive answers (linked to Y5 PoS). ▪ Refine a scientific question so that it can be tested e.g. 'What would happen to… if we changed…?' ▪ Decide whether their questions can be answered by researching or by testing. ▪ Independently ask their own scientific questions taking some ownership for finding out the answers.	▪ Recognise scientific questions that do not yet have definitive answers (linked to Y6 PoS). ▪ Refine a scientific question to make it testable i.e. ask a testable question which includes the change and measure variables, *e.g. what would happen to…if we changed…?* *e.g. What effect would we have on … if we…?* *e.g. How would exercise affect the pulse rate?* ▪ Use observations to suggest a further (testable or research) question. ▪ Independently ask a variety of scientific questions and decide the type of enquiry needed to answer them.