Our Lady Star of the Sea Science Programme of study (PoS) Year 4

Living Things– Plants	Sound	Materials
Functions of parts of a plant Identify, locate 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. Roots grow downwards and anchor the plant. Water, taken in by the roots, goes up the stem to the leaves, flowers and fruit. Nutrients (not food) are taken in through the roots. Stems provide support and enable the plant to grow towards the light. Plants make their own food in the leaves using energy from the sun. Flowers attract insects to aid pollination. Pollination is when pollen is transferred between plants by insects, birds, other animals and the wind. Seeds are formed after the flowers are pollinated. Many flowers produce fruits which protect the seed and/or aid seed dispersal. Seed dispersal, by a variety of methods, helps ensure that new plants survive. Plants need nutrients to grow healthily (either naturally from the soil or from fertiliser added to soil).	**Vibrations** 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 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. Recognise that sounds can be made in a variety of ways (pluck, bang, shake, blow) using a variety of things (instruments, everyday materials, body). Sounds travel away from their source in all directions. Vibrations may not always be visible to the naked eye. **Pitch** Find patterns between the pitch of a sound and features of the object that produced it. Sounds can be high or low pitched. The pitch of a sound can be altered. Pitch can be altered either by changing the material, tension, thickness or length of vibrating objects or changing the length of a vibrating air column. **Muffling/blocking sounds** Recognise that vibrations from sounds travel through a medium to the ear. Sounds are heard when they enter our ears (although the structure of the ear is not important key learning at this age phase). Sounds can travel through solids, liquids and air/gas by making the materials vibrate. Sound travel can be reduced by changing the material that the vibrations travel through. Sound travel can be blocked.	**Changes States of Matter** 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. Solids, liquids and gases can be identified by their observable properties. Solids have a fixed size and shape (the size and shape can be changed but it remains the same after the action). Liquids can pour and take the shape of the container in which they are put. Liquids form a pool not a pile. Solids in the form of powders can pour as if they were liquids but make a pile not a pool. Gases fill the container in which they are put. Gases escape from an unsealed container. Gases can be made smaller by squeezing/pressure. Liquids and gases can flow. THE WATER CYCLE
Health Nutrition 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. An adequate and varied diet is beneficial to health (along with a good supply of air and clean water). Regular and varied exercise *from a variety of different activities* is beneficial to health (focus on *energy in versus energy out*. Include information on making informed choices).		**Rocks** 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 Recognise that rocks and soils can feel and look different. Recognise that rocks and soils can be different in different places/ environments. Linked with work in geography, pupils explore different kinds of rocks and soils, including those in the local environment– trip to town and beach

Our Lady Star of the Sea SCIENCE KEY SKILLS YEAR 4

	Exploring and observing	Grouping and classifying	Questioning	Research	Modelling	Collaborating
	UKS2 - developing a deeper understanding of a wide range of scientific ideas and encountering more abstract ideas ***LKS2 - developing their own ideas and their understanding of the world around them***	***UKS2 - Compare and contrast a variety of examples linked to UKS2 PoS*** ***LKS2 - Compare and contrast a variety of examples linked to LKS2 PoS***	***UKS2 - asking their own questions about scientific phenomena*** ***LKS2 - asking relevant questions***	***UKS2 – summarise research from a wide variety of sources and recognising that scientific ideas change and develop over time*** ***LKS2 - finding things out using a wide range of secondary sources of information***	***using dance, drama or a visual aid to represent science in the real world***	***interacting effectively as part of a group***
Year 5	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	Suggest reasons for similarities and differences Compare and contrast things beyond their locality and use these similarities and differences to help to classify *(melting compared with dissolving, etc).* Use secondary sources of information to identify and classify. Decide which sources of information (and/or equipment and/or test) to help identify and classify	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	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	Perform / create simple models to exemplify scientific ideas using scientific terminology where appropriate *simple lever and pulley mechanisms* *Models for the solar system* *Day and night models*	Propose their own ideas and make decisions with agreement in a group Support, listen to and acknowledge others in the group e.g. Yes. I prefer that one too Check the clarity of each other's suggestions e.g. are you saying you think this one is a herbivore? Build on / add to someone else's idea to improve a plan or suggestion Understand that it is okay to disagree with their peers and offer a reasons for their opinion
Year 4	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)	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 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)*	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].	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.	Make a visual representation or a model of something to represent something they have seen or a process that is difficult to see. Suggest their own ideas on a concept and compare these with models or images.	Make some decisions about an idea within a group *(e.g. I think we should find out by testing…)* Increasingly support, listen to and acknowledge others in the group Build on / add to someone else's idea to improve a plan. Understand that it is okay to disagree with their peers and offer reasons for their opinion
Year 3	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	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, 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*	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.	Find things out using a range of secondary sources of information *(e.g. books, photographs, videos and other technology)*	Act out or make a model of something to represent something in the real world using appropriate scientific vocabulary verbally.	Begin to make some decisions about an idea within a group from a list of choices (e.g. let's put them all in a pile first OR I think we should try ….) With help; support, listen to and acknowledge others in the group (*e.g. Yes. I prefer that one too)* Build on / add to someone else's idea. *(e.g. we could use x and as well as y)* Begin to understand that it is okay to disagree with their peers and offer a reason for their opinion

Our Lady Star of the Sea SCIENCE KEY SKILLS YEAR 4

Considering Results and Conclusions

	Planning and testing	Using equipment and measure	Communicating	Describing results and looking for patterns	Explaining Results	Trusting Results
	UKS2 - using different types of scientific enquiry making decisions about and explaining choices for testing *LKS2 - making decisions about and setting up simple practical enquiries, comparative tests and fair tests*	*UKS2 - increasing complexity and increasing accuracy and precision make their own decisions about the data to collect* *LKS2 - making accurate measurements and gathering data*	*Reporting findings, recording data, presenting findings* *Read, spell and pronounce scientific vocabulary correctly linked to the relevant Yr Grp*	*UKS2 - Looking for patterns analysing functions, relationships and interactions more systematically* *LKS2 - Describing their findings/ results*	*UKS2 - draw conclusions based on / supported by evidence* *LKS2 - reporting on findings saying why something happened*	*UKS2 - comment on how reliable the data is* *LKS2 - suggest improvements for further tests*
Year 5	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 **variable**s 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**.	Make their own decisions about what observations to make or measurements to use and how long to take them for (recognising the need for repeat readings on some occasions). Take measurements using a range of scientific equipment with increasing accuracy and using more complex scales / **units** Identify possible risks to themselves and others and suggest ways of reducing these Choose the most appropriate equipment and make **accurate** measurements	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	Describe straightforward patterns in results linking cause and effect e.g. using er…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**	Use their scientific K&U and appropriate scientific language and terminology (linked to Y5 PoS) to explain their findings and data and answer their initial question Draw a valid **conclusion** (explain *why* it happened) based on their data and observations (from Y5 PoS)	Begin to recognise how repeated readings improve the **reliability** of results Compare results with others and comment on how **reliable** they are
Year 4	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.	Begin to identify where patterns might be found and use this to begin to identify what data to collect Make more of the decisions about what observations to make, how long to make them for and the type of equipment that might be used. Recognise obvious risks and how to keep themselves and others safe Learn how to use new equipment, such as data loggers & measure temperature in degrees Celsius (°C) using a thermometer. Collect data from their own observations and measurements, using notes/simple tables/standard **units** Make **accurate** measurements using standard **units** [and more complex units and parts of units] using a range of equipment and scales	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	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)*	Begin to develop their ideas about relationships and interactions between things and explain them Use relevant scientific language and vocabulary (from Y4 PoS) to begin to say/explain *why* something happened	Use results to suggest improvements, new questions and/or predictions for setting up further tests Compare their results with others and give reasons why results might be different
Year 3	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 incl. 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 qus. Find/suggest a practical way to compare things *e.g. rocks, magnets*	Collect data from their own observations and measurements using notes/ simple tables/standard units Help to make some decisions about what observations to make, how long to make them for, the type of simple equipment that might be used and how to work safely. Make simple **accurate** measurements using whole number standard **units**, using a range of equipment Gather data in a variety of ways to help in answering questions Use equipment **accurate**ly to improve the detail of their measurements/observations *(e.g. microscopes, measuring syringes, measuring cylinders, hand lenses)*	Record and present findings using simple scientific language and vocabulary from the year 3 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)	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 **prediction**s.	Use their experience and some **evidence** or results to draw a simple **conclusion** to answer their original question. Write a simple explanation of why things happened (using the word 'because') and using simple scientific language and vocabulary from the year 3 PoS	Say whether what happened was what they expected and notice any results that seem odd. Begin to recognise when a test is not **fair** and suggest improvements.