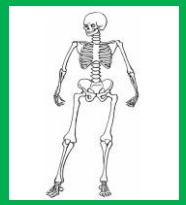
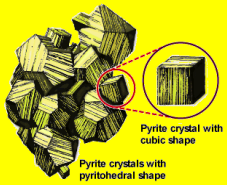
SCIENCE

Our Lady of the Rosary Science Progression of Skills

SCIENCE Knowledge & Skills Progression KS2

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

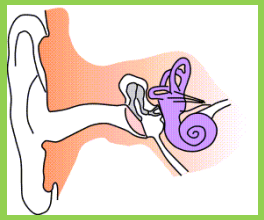
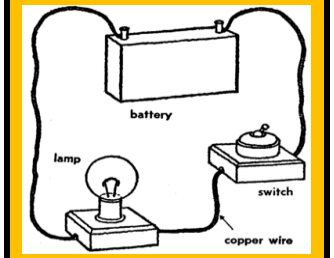
	YEAR 3	YEAR 4	YEAR 5	YEAR 6
LIVING THINGS & THEIR HABITATS/PLANTS 	• identify and describe the functions of different parts of flowering plants: roots, stem/trunk, leaves and flowers • explore the requirements of plants for life and growth (air, light, water, nutrients from soil, and room to grow) and 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. What happens to celery/flower when it is left in a glass of coloured water?	• recognise that living things can be grouped in a variety of ways • explore and use classification keys to help group, • identify and name a variety of living things in their local and wider environment • recognise that environments can change and that this can sometimes pose dangers to living things. Can we use the classification keys to identify all the animals that we caught pond dipping?	• describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird • describe the life process of reproduction in some plants and animals. Compare the collection of animals based on similarities and differences in their lifecycle. How does a bean change as it germinates?	• 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 • give reasons for classifying plants and animals based on specific characteristics. How would you make a classification key for the vertebrates/invertebrates? What happens to a piece of bread if you leave it on the windowsill for 2 weeks?

	YEAR 3	YEAR 4	YEAR 5	YEAR 6
ANIMALS & HUMANS 	• 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 • identify that humans and some other animals have skeletons and muscles for support, protection and movement. How does the skull circumference of a girl compare with that of a boy? How can we group the food that we eat?	• describe the simple functions of the basic parts of the digestive system in humans • identify the different types of teeth in humans and their simple functions • construct and interpret a variety of food chains, identifying producers, predators and prey. In our class, are omnivores taller than vegetarians? What are the names for all the organs involved in the digestive system? How does an egg shell change when it is left in coca cola or different liquids? Are foods that are high in energy always high in sugar? How do dentists fix broken teeth?	• describe the changes as humans develop to old age. Is there a relationship between a mammal's size and its gestation period? Why do people get grey/white hair when they are older?	• identify and name the main parts of the human circulatory system, and describe the functions of the heart, blood vessels and blood • recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function • describe the ways in which nutrients and water are transported within animals, including humans. Do taller people have a greater Lung capacity? Which organs of the body make up the circulatory system, and where are they found?
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. Is there a pattern in where we find volcanoes on planet Earth? Who was Mary Anning and what did she discover?			• recognise that living things have changed over time and that fossils provide information about living things that inhabited the Earth millions of years ago • recognise that living things produce offspring of the same kind, but normally offspring vary and are not identical to their parents • identify how animals and plants are adapted to suit their environment in different ways and that adaptation may lead to evolution.

LIGHT 	• recognise that they need light in order to see things and that dark is the absence of light • notice that light is reflected from surfaces • recognise that light from the sun can be dangerous and that there are ways to protect their eyes • recognise that shadows are formed when the light from a light source is blocked by a solid object • find patterns in the way that the size of shadows change. How does the distance between the shadow puppet and the screen affect the size of the shadow? When is our classroom darkest? How does the sun make light?			• recognise that light appears to travel in straight lines • 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 • explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes • use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them. How does the angle that a light ray hits a plane mirror affect the angle at which it reflects off the surface? Why do some people wear glasses to see clearly?

	YEAR 3	YEAR 4	YEAR 5	YEAR 6
FORCES & MAGNETS 	• compare how things move on different surfaces • notice that some forces need contact between two objects, but magnetic forces can act at a distance • observe how magnets attract or repel each other and attract some materials and not others • 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 • describe magnets as having two poles • predict whether two magnets will		• explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object • identify the effects of air resistance, water resistance and friction, that act between moving surfaces • recognise that some mechanisms, including levers, pulleys and gears, allow a smaller force to have a greater effect. Which shape parachute takes the longest to fall? How does the surface area of a container affect the time it takes to sink? Can you label and name all the forces acting on the objects in each of these situations?	

	attract or repel each other, depending on which poles are facing. Which magnet is strongest? Which materials are magnetic?		Do all objects fall through water in the same way?	
MATERIALS 		• 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. How does the temperature of a container of water affect how long it takes to evaporate? Which material is best for keeping hot chocolate warm? Is there a pattern in how long it takes different sized ice lollies to melt?	• 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 • know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution • use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating • give reasons, based on evidence from comparative and fair tests, for the particular uses of everyday materials, including metals, wood and plastic • demonstrate that dissolving, mixing and changes of state are reversible changes • 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. Which type of sugar dissolves the fastest? How does the temperature of tea affect how long it takes for a sugar cube to dissolve? How does a nail in salt water change over time? What are micro plastics and why are they harming the planet?	

	YEAR 3	YEAR 4	YEAR 5	YEAR 6
SOUND 		• 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 pitch of a sound and features of the object that produced it • 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. Are two ears better than one? How does the volume of a drum change as you move further away from it?		
ELECTRICITY 		• identify common appliances that run on electricity • construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers • 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 • recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit • • recognise some common conductors and insulators, and associate metals with being good conductors. Which metal is the best conductor of electricity? How does a light bulb work?		• associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit • compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches • use recognised symbols when representing a simple circuit in a diagram. How does the voltage of the batteries in a circuit affect the volume of the buzzer? Or brightness of a bulb?
EARTH & SPACE 			• describe the movement of the Earth, and other planets, relative to the Sun in the solar system • describe the movement of the Moon relative to the Earth • describe the Sun, Earth and Moon as approximately spherical bodies • use the idea of the Earth's rotation to explain day and night and the	

			apparent movement of the sun across the sky. Is there a pattern between the size of a planet and the time it takes to travel around the sun? How have our ideas about the solar system changed over time?	
EVOLUTION AND INHERITANCE				• Describe evolution and how fossils give us information about life on earth millions of years ago. • Describe how living things produce offspring but offsprings are not identical to their parents. • Explore basic genetics. • investigate how living things including humans adapt and evolve to their changing environment. Can you classify these observations into evidence for the idea of evolution, and evidence against? Is there a pattern between the size and shape of a bird's beak and the food it will eat? How have our ideas about disease and medicine changed over time?