



Science Progression Grid

Purpose of study

A high-quality science education provides the foundations for understanding the world through the specific disciplines of biology, chemistry and physics. Science has changed our lives and is vital to the world's future prosperity, and all pupils should be taught essential aspects of the knowledge, methods, processes and uses of science. Through building up a body of key foundational knowledge and concepts, pupils should be encouraged to recognise the power of rational explanation and develop a sense of excitement and curiosity about natural phenomena. They should be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, and analyse causes.

Roman Road's Science Intent:

Before our children leave Roman Road, we endeavour that they will:

- *consider themselves scientists who are confidently able to explore and discover what is around them, so that they have a deeper understanding of the world we live in.
- *be introduced to scientists from all spheres of learning (astronauts, forensic scientists, toxicologists, microbiologists).
- *have had practical experiences which encourage curiosity and questioning.
- *gain secure scientific knowledge, extend their scientific knowledge and vocabulary and understand scientific concepts.

Implementation:

Our Science Curriculum, which is part of our D.R.I.V.E.N. Creative Curriculum, has been designed with the needs of our children in mind and blends with each year group's creative themes or Maths curriculum wherever possible. Otherwise, it is taught as a discrete subject. As children move through school, staff will use this progression model to include previous learning and build upon previous knowledge.

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

		Nursery	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
WORKING SCIENTIFICALLY		*Notice detailed features of objects in their environment. *Comment and ask questions about aspects of their familiar world *Talk about some of the things they have explored and observed in nature *Talk about why things happen and how things work. *Show care and concern for living things and the environment. *Begin to understand the effect their behaviour can have on the environment.	Explore the natural world around them and enjoys being outdoors.	*Ask simple questions *Understand there are different ways to answer *Perform simple tests *Observe closely *Use simple equipment *Sort and group (Identify & classify) *Record observations *Use observations and ideas to suggest answers to questions		*Ask relevant questions *Use different types of scientific enquiries to answer *Set up simple practical enquiries, comparative and fair tests *Make systematic and careful observations *Take accurate measurements using standard units *Use a range of equipment, including thermometers and data loggers *Gather, record, classify and present data in a variety of ways *Use results to *Draw simple conclusions; make predictions for new values; suggest improvements; raise further questions *Report on results and conclusions from enquiries via oral and written explanations *Identify differences, similarities or changes related to simple scientific ideas and processes *Use evidence to answer questions or support findings		*Use their experience to explore ideas and raise different kinds of questions *Plan different types of scientific enquiries to answer questions, including recognising and controlling variables where necessary *Take measurements: -use a range of scientific equipment -increase accuracy & precision -take repeat reading when appropriate *record data and results (with increasing complexity via: -scientific diagrams and labels; -classification keys; tables; -scatter graphs; bar and line graphs *Use test results to -Make predictions -Set up further comparative and fair tests *Report and present 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 *Identify scientific evidence that has been used to support or refute ideas or arguments	

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BIOLOGY	Animals including Humans	*Develop an understanding of growth, decay and changes over time. *start eating independently. Be willing to try a range of different textures and tastes and express a preference. *begin to make healthy choices about food, drink, activity and tooth brushing. *observe and can describe in words or actions the effects of physical activity on their bodies.	Explore the natural world around them and enjoys being outdoors.	*identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals *identify and name a variety of common animals that are carnivores, herbivores and omnivores	*notice that animals, including humans, have offspring which grow into adults *find out about and describe the basic needs of animals, including humans, for survival (water, food and air) *describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene. (Links to PSHE curriculum)	*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. (Links to PSHE Curriculum)	*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 (Links to PSHE Curriculum) *Construct and interpret a variety of food chains, identifying producers, predators and prey	*describe the changes as humans develop to old age.	*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 (Links to PSHE Curriculum) *describe the ways in which nutrients and water are transported within animals, including humans. (Links to PSHE Curriculum)
	Living things and their habitats	*Develop an understanding of growth, decay and changes over time. *Become sensitised to simple life cycles i.e. tadpoles.	*Look closely at similarities, differences, patterns and change in nature *Make observations of animals and plants, including exploration of life cycles and explains why some things occur and talks about change. *Show some understanding of good practices (with regard to exercise, eating, screen time, drinking water, sleeping, brushing teeth, hygiene and road safety) and know that these can contribute to good health.		*explore and compare the differences between things that are living, dead, and things that have never been alive *identify that most living things live in habitats to which they are suited and describe how different habitats provide for the basic needs of different kinds of animals and plants, and how they depend on each other *identify and name a variety of plants and animals in their habitats, including microhabitats *describe how animals obtain their food from plants and other animals, using the idea of a simple food chain, and identify and name different sources of food.	*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	*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.	*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.	*describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals *give reasons for classifying plants and animals based on specific characteristics.

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PHYSICS	Seasonal Change	*comment and asks questions about aspects of their familiar world such as the place where they live or the natural world.	talk about the features of their own immediate environment and how environments might vary from one another. i.e. recognises that some environments are different to the one in which they live, know that there are different countries in the world and talk about the differences they have experienced or seen in photos	*observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies.	*find out and describe how healthy plants need water, light and a suitable temperature to grow and stay healthy	*recognise that shadows are formed when the light from a light source is blocked by an opaque object *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	*recognise that environments can change and that this can sometimes pose dangers to living things	*use the idea of the Earth's rotation to explain day and night and the apparent movement of the sun across the sky.	
	Earth and Space			*observe changes across the four seasons observe and describe weather associated with the seasons and how day length varies.		*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 an opaque object (Links to PSHE Curriculum)		*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.	
	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 (link to PSHE Curriculum) *recognise that shadows are formed when the light from a light source is blocked by an opaque object *find patterns in the way that the size of shadows change.			*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.

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	Electricity			*describe the simple physical properties of and compare and group together a variety of materials	*identify and compare the suitability of a variety of everyday materials		*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	*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	*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
	Forces and Magnets			*name a group of everyday materials *describe the simple physical properties of everyday materials *compare and group together a variety of everyday materials on the basis of their simple physical properties	*identify and compare the suitability of a variety of everyday materials *find out how the shapes of solid objects can be changed by squashing, bending, twisting and stretching	*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 attract or repel each other, depending on which poles are facing.		*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. *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	
	Sound			*identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense			*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.		