



## Science at RCS

### Intent

#### Foundation Stage (FS)

By the end of the Foundation Stage children will be able to talk about similarities and differences in relation to materials and living things. They will be able to make observations of animals, and plants and explain why some things occur and talk about changes. This knowledge will be specifically taught through the topics of myself (the five senses), growth, the farm and animals, when the children will grow their own plants and do experiments to see what a plant needs to grow, watch butterflies emerging from a chrysalis, and learn about different types of animals and minibeasts and what environments they like to live in. Where possible the children will observe the habitat of minibeasts in our outdoor area environment. The children will learn about the properties of different materials during free choice play activities, specifically the construction tables, water, sand and messy play and outdoor areas.

#### Key Stage 1 (KS1)

By the end of KS1 the children will have developed scientific knowledge and conceptual understanding of the following: common plants and their basic structure and what they need to grow healthily into mature plants; how plants and animals adapt to their habitats and how they all depend on each other in a food chain; common animals and their different classification names and what humans need to survive to have babies that grow into adults; everyday materials and their properties and how they make them suitable for their particular uses; know seasons have different weather and how day length varies. Pupils will have developed their understanding of scientific ideas by using different types of scientific enquiry skills including: asking simple questions and recognising that they can be answered in different ways; observing changes over a period of time and noticing patterns; grouping and classifying things; using simple equipment and performing simple comparative tests; and finding things out using secondary sources of information. Pupils will have developed their scientific vocabulary in the topics studied.

#### Lower Key Stage 2 (LKS2)

By the end of Year 4, LKS2, the children will have developed scientific knowledge and conceptual understanding of the following: functions of different parts of flowering plants and their role in the life cycle of a flowering plant; classification keys to identify and name living things; purpose of the human skeleton, muscles, teeth and digestive system and food chains; properties and uses of rocks and how fossils and soils are formed; light travels, is reflected and produces shadows that vary in size; forces and magnets and how they differ and what materials are magnetic; materials change state when they are heated or cooled and how this is seen in the water cycle; sound travels through things and causes vibrations and how the pitch and volume of sound can be altered; simple electric circuits involving wires, bulbs, buzzers, switches and common insulators and conductors of electricity. Pupils will have continued to develop their understanding of scientific ideas by using different types of scientific enquiry skills including: asking questions about what they observe and making decisions about types of scientific enquiry which are likely to be the best way of answering them; observing changes over a period of time and noticing patterns; grouping and classifying things; using simple equipment and performing simple comparative and fair tests; beginning to identify and classify; finding things out by using secondary sources of information; draw simple conclusions. Pupils will have developed their scientific vocabulary in the topics studied and demonstrated it in written tasks.

#### Upper Key Stage 2 (UKS2)

By the end of KS2 the children will have developed scientific knowledge and conceptual understanding of the following: life cycles and reproduction of plants and animals and classification of living things based on

specific characteristics; changes as humans develop to old age, the circulatory system and how lifestyle can impact on it; properties of everyday materials and how they can be separated through filtering, sieving and evaporating; movement of the Earth in relation to the sun and moon and how day and night happens; forces of gravity, air resistance, water resistance and friction; fossils provide information about living things that once lived, offspring vary from their parent and adaptation may lead to evolution; light travels in straight lines and how shadows are formed; draw circuits using symbols, compare circuits and associate brightness or volume with the number of cells in a circuit. Pupils will have continued to develop their understanding of scientific ideas by using different types of scientific enquiry skills including: asking questions about scientific phenomena and analysing functions, relationships and interactions; recognising that scientific ideas change and develop over time; selecting appropriate ways to answer science questions; observing changes over different periods of time and noticing patterns; grouping and classifying things; using simple equipment and performing simple comparative and fair tests; grouping and classifying; finding things out using a wide range of secondary sources of information; drawing conclusions based on their data and observations; using evidence to justify their ideas; using scientific knowledge and understanding to explain their findings. Pupils will have developed their scientific vocabulary in the topics studied and demonstrated it in written tasks.

### **Implementation**

We deliver our Science Curriculum through a topic based curriculum primarily. The curriculum delivered is based on the National Curriculum. Children at RCS in KS1 experience 4 units of Science over the course of the academic year, whereas in KS2 they have 5 units. Most of the time these units are taught as a whole, but sometimes they have been split up to enable cross curricular links with our topic based curriculum. At RCS we have written our own Scheme of Work (SOW) in order to deliver the units. The SOW has been written to ensure science is taught through as many scientific enquiry skills as possible, but also ensuring scientific knowledge and conceptual understanding is embedded. Children at RCS from Year 1 to Year 6 have four half terms where Science is the Assessment Focus and where the main elements of the Science Curriculum are taught. Some Science teaching may occur in half terms that do not have Science as a focus, but links well to the overall topic being delivered. In the FS children learn through a topic based curriculum and aspects of Science are woven through when applicable in line with the early learning goals. Specific concepts are taught through carpet sessions and teacher led activities as the curriculum lends itself. The children are also given opportunities to explore scientific concepts in the sand and water trays, messy play stations, malleable areas and outdoor areas daily.

In Years 1-6, Teachers can choose to deliver Science on a weekly basis for the duration of the half term, or they can block it in bigger chunks.

The detail of where all the aspects of the Science Curriculum are taught, can be seen in the table below.

Each year group also has a Curriculum Map:

<http://roehampton.wandsworth.sch.uk/curriculum/curriculum-map/> and the aspects of the Science Curriculum designated to that year group have been allocated in the half terms where Science will be a focus (in bold) and in other half terms if there is a direct link to the overall topic being delivered.

Where possible teachers will use a variety of learning styles to ensure all children have access to the curriculum. The emphasis is on imparting scientific knowledge and developing scientific enquiry skills by providing first-hand practical experiences. Teachers strive to meet the needs of all individual learners in their teaching of Science. This may include, for example, exploring a range of ways for pupils to record their scientific findings and share knowledge acquired (e.g. verbal/video presentations, hot seating, practical demonstrations) and the use of word mapping/vocabulary exploration activities to promote the understanding of scientific language. Please see our SEND/Equality Statement of Intent/Implementation for more information on ways in which we seek to ensure that all pupils have opportunities to succeed across all curriculum areas.

Year Group Topics linked to Science	Aspect of Science Curriculum	Area of Science Covered
<p><b>1</b></p> <p><b>Ourselves</b></p> <p><b>Our Local Area</b></p> <p><b>Clothes</b></p> <p><b>Growing</b></p> <p>Exploration</p>	<p>Animals including humans</p> <p>Seasonal changes</p> <p>Plants</p> <p>Everyday materials</p>	<p>Identify and name a variety of animals including fish, amphibians, reptiles birds and mammals.</p> <p>Identify and name a variety of common animals that are carnivores, herbivores and omnivores. Describe and compare the structure of a variety of common animals (fish, amphibians, reptiles, birds and mammals, including pets).</p> <p>Identify, name, draw and label the basic parts of the human body and say which part of the body is associated with each sense.</p> <p>Observe changes across the four seasons.</p> <p>Observe and describe weather associated with the seasons and how day length varies.</p> <p>Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees. Identify and describe the basic structure of a variety of common flowering plants, including trees.</p> <p>Distinguish between an object and the material from which it is made. Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water, and rock. Describe the simple physical properties of a variety of everyday materials. Compare and group together a variety of everyday materials on the basis of their simple physical properties.</p>
<p><b>2</b></p> <p><b>Animals and their habitats</b></p> <p><b>Homes</b></p> <p>Space</p> <p>Africa</p> <p><b>The common and healthy living</b></p>	<p>Living things and their habitat</p> <p>Uses of everyday materials</p> <p>Plants</p>	<p>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.</p> <p>Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard for particular uses. Find out how the shapes of solid objects made from some materials can be changed by squashing, bending, twisting and stretching.</p> <p>Identify and name a variety of plants and animals in their habitats, including micro-habitats.</p> <p>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. Observe and describe how seeds and bulbs grow into mature plants.</p> <p>Find out and describe how plants need water, light and a suitable temperature to grow and stay healthy.</p>

<b>The Seaside</b>	Animals including humans	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.
<p>3</p> <p>Our Local Area</p> <p><b>Crocodiles</b></p> <p>Rocks and the Stone Age</p> <p><b>The Caribbean</b></p> <p><b>Let there be Light</b></p> <p><b>The Iron Man</b></p>	<p>Animals, including humans</p> <p>Rocks</p> <p>Plants</p> <p>Light</p> <p>Forces and Magnets</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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 an opaque object. Find patterns in the way that the size of shadows change.</p> <p>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.</p>
4	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.
Romans		

<p><b>Journeys</b></p> <p><b>On the Move</b></p> <p><b>Insects and Minibeasts</b></p> <p><b>Down on the Farm</b></p>	<p>States of matter</p> <p>Electricity</p> <p>Living things and their habitats</p> <p>Animals, including humans</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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.</p>
<p>5</p> <p><b>Hubble Bubble</b></p> <p><b>Ancient Greece</b></p> <p><b>Time</b></p> <p><b>The Wonder of Nature</b></p>	<p>Properties and changes of materials</p>	<p>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,</p>

<p>The Tale of Two Cities (Paris and London)</p>	<p>Forces</p> <p>Earth and Space</p> <p>Living things and their habitats</p> <p>Animals including humans</p>	<p>including changes associated with burning and the action of acid on bicarbonate of soda.</p> <p>Explain that unsupported objects fall towards the Earth because of the force of gravity acting between the Earth and the falling object.</p> <p>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.</p> <p>Describe the movement of the Earth, and other planets, relative to the Sun in the solar system.</p> <p>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.</p> <p>Describe the differences in the life cycles of a mammal, an amphibian, an insect and a bird.</p> <p>Describe the life process of reproduction in some plants and animals.</p> <p>Describe the changes as humans develop to old age.</p>
<p>6</p> <p><b>Turning points in British History</b></p> <p>The Lady of Shallot</p> <p><b>Africa in the Past</b></p> <p><b>Circuits</b></p> <p><b>The Science of Survival</b></p>	<p>Light</p> <p>Animals, including humans</p> <p>Evolution and inheritance</p> <p>Electricity</p>	<p>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.</p> <p>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.</p> <p>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.</p> <p>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</p>

	Living things and their habitats	recognised symbols when representing a simple circuit in a diagram. 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.
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