

## INTENT

St Mary's school encourage children at KS2 to investigate the world around them. Science is taught in Topics which align with the National Curriculum for England. They experience investigations which allow them to assimilate knowledge, scientific methods, and processes. Pupils must enjoy and be enthused at finding out and asking the question WHY?

Across all science topics studied at KS2, pupils can demonstrate their curiosity in what they see and their evidence-based decision-making skills as well as using relevant vocabulary and reporting skills. Below is a list of what National Curriculum science topic areas our sub-categories cater for:

- Science Investigation covers 'working scientifically';
- Physical Processes covers 'light'; 'forces and magnets'; 'sound'; 'electricity';
- Materials and their Properties covers 'states of matter'; 'properties and changes of materials';
- Earth and Space;
- Life processes and living things covers 'plants'; 'animals, including humans'; 'living things and their habitats'; 'evolution and inheritance'.

## IMPLEMENTATION

### **Lower Juniors**

During years 3 and 4, pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- 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;
- 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

## Proposed Rolling Programme for 2020-2022

2020/21	1 Plants <ul style="list-style-type: none"> <li>a) Structure</li> <li>b) Growth/photo</li> <li>c) Water transport Flower, pollination &amp; dispersal.</li> </ul>	2 Measuring <ul style="list-style-type: none"> <li>a) Mass</li> <li>b) Volume</li> <li>c) temperature</li> <li>d) Time</li> </ul>	3 States of Matter <ul style="list-style-type: none"> <li>• Solids liquids &amp; gases</li> <li>• Changes with temperature</li> <li>• Water Cycle</li> </ul>	4 Light Light <ul style="list-style-type: none"> <li>• Shadows and size of shadows</li> <li>• Reflection of light (mirrors)</li> <li>• Can be extended to concave and convex</li> </ul>	5 Living Thing <ul style="list-style-type: none"> <li>a) Habitats</li> <li>b) Food Chains</li> <li>c) Classification &amp; keys</li> <li>d) Man impact</li> </ul>	6 Rocks <ul style="list-style-type: none"> <li>a) Different types</li> <li>b) How fossils are formed</li> </ul> Investigating soils and comparison
2021/22	7 Animals <ul style="list-style-type: none"> <li>a) Nutrition types of diet.</li> <li>b) Skeleton &amp; muscles</li> </ul>	8 Animals <ul style="list-style-type: none"> <li>a) Digestion</li> <li>b) Teeth</li> </ul> Food chains	9 Electricity <ul style="list-style-type: none"> <li>a) Circuit components</li> <li>b) Series circuits</li> <li>c) Conductors &amp; Insulators</li> <li>d) Current &amp; Voltage</li> </ul> Measuring current and voltage	10 Sound <ul style="list-style-type: none"> <li>a) Sound is vibration</li> <li>b) Ear function &amp; ear protection</li> </ul> Volume (Decibels)  Measuring sound	11 Forces & Magnets <ul style="list-style-type: none"> <li>a) Movement/friction</li> <li>b) Magnetic forces, poles, attraction &amp; repulsion</li> <li>c) Are all materials magnetic</li> <li>d) Strength of magnets. How can we measure</li> </ul>	12 Environment Pond Studies Using keys, food chains, adaptations

Light Blue = National Curriculum Year 3    Dark Blue = National Curriculum Year 4    Red = Extensions

## Upper Juniors

During years 5 and 6, pupils are taught to use the following practical scientific methods, processes and skills through the teaching of the programme of study content:

- 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, 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 a 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



# Proposed Rolling Programme Upper Juniors September 2021-2022

2021/22	<p>1 Forces</p> <ul style="list-style-type: none"> <li>a) What is a force?</li> <li>b) Gravity. Exp't of Galileo and Neil Armstrong. Cars &amp; ramps.</li> <li>c) Air resistance, parachutes, sycamore seeds.</li> <li>d) Water resistance. Boats</li> <li>e) Friction advantages and disadvantages</li> </ul> <p>Levers, pulleys and gears to allow small forces to have a greater effect...</p>	<p>2 Earth &amp; Space</p> <ul style="list-style-type: none"> <li>a) Earth within our solar system</li> <li>b) Other planets</li> <li>c) Movement of the moon</li> <li>d) Earth rotation and movement around the sky also height in summer and winter.</li> </ul> <p>Work of Ptolemy, Alhazen and Copernicus Computer research using both <i>WORD &amp; PUBLISHER</i>.</p>	<p>3 Light</p> <p><b>What is light. Light as a provider of clean energy. Photovoltaics &amp; solar cells.</b></p> <ul style="list-style-type: none"> <li>a) Light sources.</li> <li>b) Light being reflected into the eye.</li> <li>c) Light travels in straight lines so shadows have the same shape as the object. Shadow puppets</li> <li>d) Light travelling to mirrors and lenses.</li> </ul> <p>Rainbows and mixing light <b>Skin care. Slip slop slap. Sun stroke.</b></p>	<p>4 Animals &amp; Humans</p> <ul style="list-style-type: none"> <li>a) Growth stages of development. Including changes at puberty. Secondary sexual characteristics.</li> </ul> <p>Gestation periods. Why there is a need to control populations. Family planning Comparing other animals. Recording the length and mass of baby growth</p>	<p>5 Living things and their habitats</p> <ul style="list-style-type: none"> <li>a) Classification</li> <li>b) Characteristic of living things</li> <li>c) Animals &amp; Plant.</li> <li>d) Vertebrates and invertebrates.</li> <li>e) Simple keys.</li> </ul> <p>Carl Linnaeus &amp; naming.</p>	<p>6. Micro-organisms</p> <ul style="list-style-type: none"> <li>a. Types of Microbes. Bacteria, Viruses &amp; Fungi</li> <li>b. Microbes and food. Yeast &amp; Fermentation Making Yoghurt</li> <li>c. Microbes cause disease, Cholera, Covid 19 &amp; Tooth Decay.</li> </ul>
2020/21	<p>7 Electricity</p> <ul style="list-style-type: none"> <li>a) Series circuit. Voltage of cells and the relationship between bulb brightness / volume of buzzer and voltage.</li> <li>b) Voltage pushes electricity. We measure electricity using an ammeter in Amps.</li> <li>c) Conductors &amp; insulators.</li> </ul> <p>Electricity safety. <b>Solar to electrical energy. Parallel circuits. Resistors</b></p>	<p>8 Evolution &amp; Inheritance</p> <ul style="list-style-type: none"> <li>a) How living things have changed. Fossils Darwin, Wallace and Mary Anning.</li> <li>b) What makes me me. How genes/characteristics are passed in sperm &amp; eggs</li> <li>c) Variation &amp; Selective breeding in dogs</li> </ul> <p>Natural Survival of the fittest. The fastest rabbit, the giraffe with the longest neck. <b>Artificial selection (selective breeding) importance in agriculture.</b></p>	<p>9 Properties &amp; Changing of materials</p> <ul style="list-style-type: none"> <li>a) Grouping materials solubility, transparency, conductivity, magnetic</li> </ul> <p>Solutions, dissolving, separating salt from sand. Reversible and non-reversible reactions <b>Burning Thermal conductivity Testing Milk and making yoghurt.</b></p>	<p>10 Living things and their habitats</p> <ul style="list-style-type: none"> <li>a) Life cycles of plants mammals, an amphibian, an insect &amp; a bird.</li> <li>b) Sexual &amp; asexual reproduction in plants. Growing seeds (conditions)</li> </ul> <p><b>Hatching of eggs, growth experiment in chicks monitoring weight increase.</b></p>	<p>11 Animals &amp; Humans</p> <ul style="list-style-type: none"> <li>a) Circulatory System heart blood vessels</li> <li>b) Diet exercise, drug &amp; lifestyle</li> <li>c) Blood, water &amp; transport</li> </ul> <p>Diet, exercise, drugs/medicines (smoking, alcohol, caffeine), lifestyle and healthy. Benefits of being outdoors. Lower risk of spreading diseases and mental wellbeing. <b>Using digital thermometers and oximeters.</b></p>	.

Light Blue = National Curriculum Year 5   Dark Blue = National Curriculum Year 6   Red = Extensions

Many aspects are cross-curricular and form elements within the health area the PHSE programme of study.

## IMPACT

At the end of each module a test is taken. Pupils Achieved national standard (**GREEN**), below national standard (**RED**), and higher level (**BLUE**). Marks are entered onto science assessments and transferred onto Scholarpack where progress and the impact of the program of study can be tracked. At the end of KS2 a year 6 average of above 50% equates to the National Standard and 70% equates to the Higher Level. These assessments are forwarded to the relevant High School.

