

**Curriculum Quality 2019-2020**  
Science

**Subject Leader:**  
Phoebe Tavenner

**Intent:**

The Marchant Holliday School aims to give all children a strong understanding of the world around them whilst acquiring specific skills and knowledge to help them to think scientifically, to gain an understanding of scientific processes and an understanding of the uses and implications of Science, today and for the future. Scientific enquiry skills are embedded through topics across the year; these are then revisited and developed throughout their time at school. For example, Electricity is covered in Lower Key Stage 2 and is revisited in Upper Key Stage 2. This model allows children to build upon their prior knowledge and increases their enthusiasm for the topics whilst embedding this procedural knowledge into the long-term memory. All children are encouraged to develop and use a range of skills including observations, planning and investigations, as well as being encouraged to question the world around them and become independent learners in exploring possible answers for their Science-based questions.

**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.

**The overarching concepts for Science at the Marchant-Holliday School are:**

- a positive attitude towards Science;
- an understanding of Science through a process of enquiry and investigation;
- confidence and competence in scientific knowledge, concepts and skills;
- an ability to reason, predict, think logically and to work systematically and accurately;
- an ability to communicate scientifically;
- the ability and understanding to use and apply Science across the curriculum and real life;
- the ability to apply their knowledge of English and Mathematics to their understanding of Science, including collecting, presenting and analysing data;
- to work with regard for their own safety and that of others

**Implementation:**

At The Marchant Holliday School children will follow a 2-year rolling programme, which is planned to ensure that children are given opportunities to access the National Curriculum programmes of study from Key Stage 1 and 2. As many of our Year 7 children have missed significant parts of the National Curriculum they will be continuing to follow the Year 6 Science content to ensure their knowledge and skills are embedded. In each Science topic, the children learn which of the specific Science disciplines the topic covers and will have a balance of Biology, Chemistry and Physics lessons over their time at the school.

Science is taught using a cross-curricular approach to enable the achievement of a greater depth of knowledge. Children are encouraged to ask their own questions and given opportunities to use their scientific skills and research to discover the answers. This curiosity is celebrated within the classroom. Planning involves teachers creating

engaging lessons, often involving high-quality resources to aid understanding of conceptual knowledge. By working on one key theme, in each cross-curricular topic, the pupils will have greater opportunity to observe changes over time, carry out research and make comparative and fair tests.

Working Scientifically, skills such as noticing changes and grouping and classifying, are embedded into lessons to ensure these skills are being developed throughout the children's school career and challenging concepts are introduced through direct teaching. This is developed through the years, in keeping with the topics. Teachers demonstrate how to use scientific equipment, and the various Working Scientifically skills in order to embed scientific understanding. Teachers find opportunities to develop children's understanding of their surroundings by accessing Outdoor Learning and Workshops with experts. Children are offered a wide range of visits, trips and visitors to complement and broaden the curriculum. These are purposeful and link with the knowledge being taught in class.

As well as being taught science lessons, as part of learning experiences, pupils will have weekly 'working scientifically' sessions in order to develop their scientific enquiry and understanding. This will often be delivered through STEM sessions.

### **What is STEM?**

The term STEM is used to describe science, technology, engineering and mathematics. STEM is a curriculum based on the idea of educating pupils in the four specific disciplines — science, technology, engineering and mathematics — in an interdisciplinary and applied approach. STEM is a means of offering coherent learning experiences that make connections between the individual curriculum subjects explicit and enhance learning in all of them. Through our STEM provision, we strive to ensure every child has the opportunity to explore, play and problem solve through an integrated, cross-curricular approach.

The Association for Science Education (which we are members of) states:

As children carry out scientific enquiry they should develop a host of skills and competencies, knowledge and understanding, bringing enormous benefits to them as 'growing' scientists. Scientific enquiry increases children's capacity to:

- Problem-solve and answer questions. Rich opportunities are provided where children explore their own ideas, develop and deepen conceptual understanding.
- Work with independence. Thinking and reasoning is nurtured alongside a host of qualities, including resilience, determination and confidence.
- 'Be a scientist'. A necessary toolkit of practical skills is developed and added to over time.
- Communicate effectively. Technical and scientific vocabulary is learned, practised and used, as children communicate evidence in a variety of ways, often with different audiences in mind.

**Curriculum Overview (Knowledge and Skills)**

	<b>Autumn 1</b>	<b>Autumn 2</b>	<b>Spring 1</b>	<b>Spring 2</b>	<b>Summer 1</b>	<b>Summer 2</b>
<b>Year 1/2 A</b>	<b>London's Burning</b> Properties of materials.	<b>Amazing Animals</b> Animals including humans: naming, identifying and classifying animals.	<b>Passport to China</b> _ STEM OPPORTUNITIES	<b>Watch out there's a Monster About</b> Science: parts of the human body and their functions. Food chains.	<b>The Secret Garden</b> Life cycle of a plant; structure of a plant, plant identification	<b>I do Like to be Beside the Seaside.</b> Seasonal changes
<b>Year 1/2 B</b>	<b>Dungeons and Dragons</b> Uses of everyday materials Identifying and comparing the suitability of materials	<b>Out of Africa</b> -STEM OPPORTUNITIES	<b>Brilliant Brunel</b> - STEM OPPORTUNITIES	<b>How to Grow a Human</b> Notice that animals including humans have offspring Basic survival needs of humans Importance of exercise, diet and hygiene	<b>A World of Art</b> - STEM OPPORTUNITIES	<b>Predators and Prey</b> Living things and their habitats Life cycles, food chains, micro habitats-
<b>Year 3/4 A</b>	<b>The Ancient Egyptians</b> The parts of the body, digestive system and teeth	<b>The Electric Age (Unplugged)</b> Electricity, circuits, conductors and insulators	<b>What's the Matter?</b> Compare and group materials, observe changes in state, study evaporation and condensation	<b>A Drop in the Ocean</b> Food chains, classify living things using classification keys, living things and their habitats	<b>Around the world in 80 Days</b> sound waves, sending and receiving messages	<b>Roll out the Romans</b> -STEM OPPORTUNITIES

<b>Year 3/4 B</b>	<b>History Rocks!</b> Rocks and Fossils- comparing and grouping by physical properties	<b>Remember, Remember.</b> Light and shadows	<b>Exploding Earth</b> Forces and magnets	<b>Metal Works</b> -STEM OPPORTUNITIES	<b>Chocolate: Frome Bean to Bar</b> Plants, life cycles of plants, water transportation within plants, pollination , seed formation and dispersal	<b>Go Ape (Rainforests)</b> Animals skeletons and nutrition,
<b>Year 5/6/7 A</b>	<b>Crime and Punishment</b> Year 7s only in Aut. 1 The Norman Invasion Muscles and the skeletal system	<b>Robots (Iron Man)</b> Light sources, reflection, shadows, electricity and circuits	<b>Can I fall into Space?</b> Gravity, solar systems, light and shadows, forces.	<b>Explorers &amp; Trailblazers</b> -STEM OPPORTUNITIES	<b>The Mayans in The Americas</b> --STEM OPPORTUNITIES	<b>Planet Earth</b> Biomes, vegetation belts, land use, classification and inheritance
<b>Year 5/6/7 B</b>	<b>Ancient Greece</b> --STEM OPPORTUNITIES	<b>Magic &amp; Muggles</b> Properties of materials, substances, solutions, mixtures , separation changes in states	<b>Blue Planet</b> Living things and their habitats, lifecycles of animals, classification, fossils, adaptation, evolution and inheritance	<b>Raiders &amp; Invaders</b> -STEM OPPORTUNITIES	<b>Being Human</b> Human circulatory system, diet, health, exercise, drugs, lifestyle, nutrition and water, Muscles and the skeletal system	<b>Incredible India</b> --STEM OPPORTUNITIES

**Impact:**

This approach results in a fun, engaging, high-quality Science education that provides children with the foundations for understanding the world. Our engagement with the local environment ensures that children learn through varied and first hand experiences of the world around them. Through various workshops, trips and interactions with experts, children have the understanding that Science has changed our lives and that it is vital to the World's future prosperity. Pupil voice is used to further develop the Science curriculum and questioning of pupil's views and attitudes to Science is used as an assessment of understanding and of pupil enjoyment. This supports the children's enjoyment of Science and motivates them as scientific learners. Our engagement with the local environment, through our extensive school grounds, which include wildlife ponds, a quarry, woodland areas and donkey sanctuary, ensures that children learn through varied and first hand experiences of the world around them. Frequent, continuous and progressive learning outside the classroom is embedded throughout the Science curriculum. Children learn the possibilities for careers in Science and due to our development of STEM activities; they become motivated learners with sound scientific understanding.

All children will have:

- A wider variety of skills linked to both Scientific knowledge and understanding, and Scientific enquiry/investigative skills;
- High aspirations, which will see them through to further study, work and a successful adult life;
- Skills which equip them to progress from their starting points, and within their everyday lives

**By the end of Key Stage 1-**

Children will be confident to ask questions, make predictions and begin to recognise how Science affects everyday life.

**By the end of Key Stage 2 –**

Children will be able to ask and answer questions using a range of scientific vocabulary. They will be increasingly able to make reasoned predictions and develop their awareness of key scientific developments and their impact on the wider world.

**By the end of Year 7 –**

Children will have a developing understanding of the features and content of the 3 Science disciplines (Physics, Chemistry and Biology) and will have consolidated understanding and scientific skills from earlier learning in readiness for continuing the curriculum into years 8 and 9.