Overview of the Marish Academy Trust Science Curriculum

In teaching children Science, our intent is that they:

- Develop a passion for science in the past, present and future and the knowledge to think and question scientifically.,
- Demonstrate their knowledge and understanding in written and verbal explanations, through solving challenging problems and reporting findings.
- Become thoroughly confident and competent in practical scientific skills, so that they can plan and undertake increasingly complex investigations.
- Extend their ability to undertake practical work into a variety of contexts, including fieldwork and using technology.
- Show innovation, imagination and originality, in their pursuit of scientific excellence.

Science in Early Years and Foundation Stage

In EYFS in our trust schools children develop the foundation of scientific skills through exploration, play and adult directed teaching. The science aspects of the curriculum in EYFS are based upon Early learning Goals Understanding the World and the guidance provided in the Early Years and Foundation Stage Profile handbook as outlined below:

ELGs: The Natural World:

- *Explore the natural world around them, making observations and drawing pictures of animals and plants.*
- *Know some similarities and differences between the natural world around them and contrasting environments, drawing on their experiences and what has been read in class.*
- *Understand some important processes and changes in the natural world around them, including the seasons and changing states of matter.*

Transition from EYFS to KS1

At the end of Reception we move on to transition work with the vast majority of children to consolidate their skills and prepare them for the Science Curriculum in year 1 and beyond, which is based upon the revised national curriculum.

Science Curriculum Design and Coverage in Year 1-6 at Marish Academy Trust

Our Science Curriculum Design is divided into Breadth of learning, (content to be covered) and Threshold concepts or skills strands which are progressive and revisited each year throughout the Primary experience.

In KS1 and KS2 the breadth encompasses:

1. **Working Scientifically** *(across all year groups scientific knowledge and skills should be learned by working scientifically).*

2. **Biology**	**Birth to three**	**Three and four year olds (Nursery)**	**Reception**	**KS1**	**KS2**
	. • Explore and respond to different natural phenomena in their setting and on trips. *• Make connections between the features of their family and other families.* *• Notice differences between people.*	*• Talk about what they see, using a wide vocabulary.* *• Begin to make sense of their own life-story and family's history.* *• Plant seeds and care for growing plants.* *• Understand the key features of the life cycle of a plant and an animal.* *• Begin to understand the need to respect and care for the natural environment and all living things.* *• Make healthy choices about food, drink, activity and toothbrushing.* *• Understand 'why' questions,*	*• Explore the natural world around them.* *• Describe what they see, hear and feel while they are outside.* *• Recognise some environments that are different from the one in which they live.* *• Understand the effect of changing seasons on the natural world around them.* *• Know and talk about the different factors that support their overall health and wellbeing: - regular physical activity - healthy eating - toothbrushing - sensible amounts of 'screen time' - having a good sleep routine - being a safe pedestrian*	*Plants* *• Identify, classify and describe their basic structure.* *• Observe and describe growth and conditions for growth.* *Habitats* *• Look at the suitability of environments and at food chains.* *Animals and humans* *• Identify, classify and observe.* *• Look at growth, basic needs, exercise, food and hygiene.* *All living things** *• Investigate differences.*	*Plants* *• Look at the function of parts of flowering plants, requirements of growth, water transportation in plants, life cycles and seed dispersal.* *Evolution and inheritance* *• Look at resemblance in offspring.* *• Look at changes in animals over time.* *• Look at adaptation to environments.* *• Look at differences in offspring.* *• Look at adaptation and evolution.* *• Look at changes to the human skeleton over time.* *Animals and humans* *• Look at nutrition, transportation of water and nutrients in the body, and the muscle and skeleton system of humans and animals.* *• Look at the digestive system in humans.* *• Look at teeth.* *• Look at the human circulatory system.* *All living things* *• Identify and name plants and animals* *• Look at classification keys.* *• Look at the life cycle of animals and plants.* *• Look at classification of plants, animals and micro-organisms.* *• Look at reproduction in plants and animals, and human growth and changes.* *• Look at the effect of diet, exercise and drugs.*

3. **Chemistry**	*• Explore materials with different properties.* *• Explore natural materials, indoors and outside*	*• Use all their senses in hands-on exploration of natural materials.* *• Talk about what they see, using a wide vocabulary.* *• Talk about the differences between materials and changes they notice.* *• Explore collections of materials with similar and/or different properties.* *• Understand 'why' questions.*	*• Use talk to work out problems and organise thinking and activities. Explain how things work and why they might happen. • Use new vocabulary in different contexts.*	***Materials*** *• Identify, name, describe, classify, compare properties and changes.* *• Look at the practical uses of everyday materials.*	***Materials*** *• Examine the properties of materials using various tests.* *• Look at solubility and recovering dissolved substances.* *• Separate mixtures.* *• Examine changes to materials that create new materials that are usually not reversible.* ***Rocks and fossils*** *• Compare and group rocks and describe the formation of fossils.* ***States of matter*** *• Look at solids, liquids and gases, changes of state, evaporation, condensation and the water cycle.*
Physics	*• Repeat actions that have an effect.*	*• Talk about what they see, using a wide vocabulary.* *•Explore and talk about different forces they can feel.* *• Explore how things work.* *• Understand 'why' questions,*	*• Understand the effect of changing seasons on the natural world around them.*	***Light**** *• Look at sources and reflections.* ***Sound**** *• Look at sources.* ***Electricity**** *• Look at appliances and circuits.* ***Forces*** *• Describe basic*	***Light*** *• Look at sources, seeing, reflections and shadows.* *• Explain how light appears to travel in straight lines and how this affects seeing and shadows.* ***Sound*** *• Look at sources, vibration, volume and pitch.* ***Electricity*** *• Look at appliances, circuits, lamps, switches, insulators and conductors.* *• Look at circuits, the effect of the voltage in cells and the resistance and conductivity of materials.*

				movements. ***Earth and space*** *• Observe seasonal changes.*	***Forces and magnets*** *• Look at contact and distant forces, attraction and repulsion, comparing and grouping materials.* *• Look at poles, attraction and repulsion.* *• Look at the effect of gravity and drag forces.* *• Look at transference of forces in gears, pulleys, levers and springs.* ***Earth and space*** *• Look at the movement of the Earth and the Moon* • *Explain day and night*

These are also the names given to the four threshold concepts we teach in science. It is obvious how the content in working scientifically transfers to skills, but further breakdown is given for Biology, Chemistry and Physics Threshold concepts/skill strand shown below:

<u>Progression of Biology Strand- Science Curriculum Marish Academy Trust 2019</u>

Biology	Chemistry	Physics
• **Understand plants** This concept involves becoming familiar with different types of plants, their structure and reproduction.	**Investigate materials** This concept involves becoming familiar with a range of materials, their properties, uses and how they may be altered or changed.	• **Understand movement, forces and magnets** This concept involves understanding what causes motion.
• **Understand animals and humans** This concept involves becoming familiar with different types of animals, humans and the life processes they share.		• **Understand the Earth's movement in space** This concept involves understanding what causes seasonal changes, day and night.
• **Investigate living things**		• **Investigate light and seeing**

This concept involves becoming familiar with a wider range of living things, including insects and understanding life processes.		This concept involves understanding how light and reflection affect sight.
• **Understand evolution and inheritance** This concept involves understanding that organisms come into existence, adapt, change and evolve and become extinct.		• **Investigate sound and hearing** This concept involves understanding how sound is produced, how it travels and how it is heard. • **Understand electrical circuits** This concept involves understanding circuits and their role in electrical applications.