

Intent

At AHPS, our Science curriculum ignites curiosity and wonder about the natural world, developing a lifelong passion for scientific inquiry. We aim to develop pupils' scientific knowledge and conceptual understanding, whilst also equipping them with the scientific skills required to understand the uses and implications of science, today and for the future. Our curriculum builds a foundation of critical thinking skills, encouraging pupils to question, hypothesise and investigate the world around them. Through engaging, practical experiences, we make science accessible and enjoyable for all learners, connecting scientific concepts to real-world applications and helping pupils understand the vital role of science in addressing global challenges.

Our curriculum draws from a rich variety of resources, including Pzaz, materials from the Association for Science Education, and STEM learning platforms. We ensure our content is inclusive, challenging and relevant to pupils' lives beyond the classroom.

Through practical investigations, collaborative projects and cross-curricular links, we empower our young scientists to:

- Observe and explore natural phenomena
- Ask questions and develop their own ideas
- Plan and carry out scientific investigations
- Analyse data and draw conclusions
- Communicate their findings effectively

By the end of their primary education, our pupils will have developed a solid foundation in scientific knowledge and skills, preparing them for future academic pursuits and enabling them to make informed decisions in an increasingly scientific and technological world.

Implementation

Timetable

In EYFS, Science is integrated into the 'Understanding of the World' area of learning. Teachers in the EYFS connect the scientific elements of children's activities to the objectives outlined in the Early Learning Goals (ELGs).

- In KS1 and KS2, Science lessons are scheduled on a weekly basis.

- Science education follows a 36-week academic year, with instruction organised into teaching and learning blocks that encompass biology, chemistry, and physics.
- A dedicated Science week offers pupils the chance to engage collaboratively in various scientific endeavours, participate in a science investigations, attend workshops, and either perform in or observe an assembly centred on scientific breakthroughs.

Subject Leadership

- The Science subject leader frequently reviews lesson plans, examines pupils' work, and compiles evidence to showcase progress and achievement in Science. The subject leader works closely with individual teachers, year groups, and the whole school to ensure a unified and coherent approach across the curriculum.

Resources

- Every classroom features a Science display that emphasises the current topic being studied by the class. Key scientific terminology is prominently featured to encourage pupils to use it in both spoken and written activities. Pupils' work is often displayed to demonstrate expected standards of scientific learning and to highlight key concepts and principles. Photographs of experiments or real-world scientific phenomena help make abstract ideas more tangible for pupils.
- A wide array of Science resources are available to support the teaching and learning process, including tools for demonstrating scientific concepts, such as models of skeleton. These resources are centrally stored to assist teachers in planning and delivering engaging and informative lessons.
- A variety of equipment is provided to help pupils learn how to accurately and precisely record data, including items like measuring cylinders, force meters, different types of rocks, magnets, and materials for electricity and light experiments.
- Comprehensive lesson plans are provided for each unit, with clear links to learning objectives that help pupils meet both individual and connected goals throughout each unit. The plans align with the knowledge and skills progression document across the year groups, which further supports effective Science instruction.

Enrichment

- Educational trips are an essential component of the Science curriculum, bringing Science to life by offering real-world examples of scientific principles. Additionally, workshops are frequently brought into the school to give all pupils a richer learning experience.

Topics and Rationale

EYFS

Science is broadly taught through the 'Understanding the World' strand of the EYFS curriculum, with connections to other areas of learning. 'Understanding the World' is divided into 'People and Communities', 'The World', and 'Technology'. Science is introduced through activities that encourage exploration, problem-solving, observation, prediction, thinking, decision-making, and discussions about the world. Children begin to explore animals, people, plants, and objects in their natural settings. They observe objects and materials to spot differences and similarities and use their senses for clearer observations. Children are encouraged to ask questions about how and why things work.

KS1

In Year 1, pupils start with the 'Plants' unit, where they learn to identify and name common local plants and understand the basic structure of plants by creating diagrams. They might record seasonal changes in plants, which ties into the 'Seasonal Changes' unit. Pupils engage in scientific activities by making weather tables and charts for different seasons. The 'Animals Including Humans' unit introduces pupils to various animal classifications and methods for comparing animal groups. They also begin to identify and label parts of the human body, relating them to the senses. In the 'Use of Everyday Materials' unit, pupils learn about the materials that everyday objects are made from and describe their physical properties. They conduct simple tests to answer questions about the characteristics and uses of different materials.

In Year 2, the 'Animals Including Humans' unit allows pupils to learn about the basic needs of animals and the importance of healthy living for humans. They engage in scientific observation to see how animals grow and change. In the 'Plants' unit, they observe and describe how plants grow from seeds and bulbs. Pupils are introduced to comparative tests by investigating how various factors influence plant growth. In the 'Living Things and Their Habitats' unit, they learn what habitats are and how living things are adapted to their environments. Pupils then explore how the shapes of solid materials can be changed in the 'Uses of Everyday Materials' unit.

KS2

In Year 3, the 'Plants' unit helps pupils deepen their understanding of the essential requirements for plant life and growth, particularly how water is transported within plants. They also learn about the role of flowers in the life cycle of flowering plants. The 'Animals Including Humans' unit focuses on identifying the functions of skeletons and muscles in animals, and pupils begin to group animals with and without skeletons. In the 'Light' unit, pupils learn about the importance of light and explore concepts like reflection and shadow formation. The 'Forces and Magnets' unit introduces them to common forces affecting object movement and the interaction between objects. They

begin identifying magnetic materials and making predictions about whether two magnets will attract or repel each other. In the 'Rocks' unit, pupils scientifically explore different types of rocks and soils, including those in their local environment. They use comparative skills to group rocks based on physical properties and understand rock formation.

In Year 4, the 'Animals Including Humans' unit builds on prior knowledge about healthy living by teaching pupils about the correct types and amounts of nutrition, as well as comparing and contrasting diets of different animals. The 'All Living Things' unit expands on classification knowledge by introducing pupils to classification keys and recognising environmental changes that affect various species. They also consider the impact of human activity on the environment, linking this to their understanding of citizenship. The 'States of Matter' unit revisits materials and observes how they change state when heated or cooled. Pupils gain an understanding of temperature measurements and learn about chemical processes such as evaporation and condensation. The 'Sound' unit helps pupils identify how sounds are produced and relate them to the vibration of particles, recognising that vibrations must travel through a medium. Pupils investigate how different factors affect volume and pitch scientifically. In the 'Electricity' unit, pupils learn to use electrical symbols to represent circuit components. They create tests to determine if a lamp will light in a series circuit, based on different variables, and carefully observe patterns. They also learn to identify certain materials as insulators and conductors.

In Year 5, the 'Animals Including Humans' unit develops pupils' understanding of changes that occur as humans grow older. They research and compare gestation periods across different animals. They describe differences in the life cycles of various animal groups and learn about reproduction in the 'Life Cycles' unit. The 'Properties of Everyday Materials and Reversible Changes' unit continues pupils' understanding of material properties and changes by conducting tests. They learn that some materials dissolve and that this process can be reversed. They demonstrate reversible changes and identify how mixtures can be separated using different chemical processes. The 'Earth and Space' unit helps pupils describe the movement of planets relative to the Sun in the solar system and understand the Earth's rotation to explain day and night. The 'Forces' unit revisits common forces, and pupils now explain gravity's role in causing objects to fall towards the Earth. They conduct scientific tests to investigate the effects of air resistance, water resistance, and friction.

In Year 6, pupils learn to name and identify the function and main parts of the human circulatory system in the 'Animals Including Humans / Water Transportation' unit. They build on their knowledge of healthy lifestyles by recognising the impact of lifestyle choices on body function. The 'Evolution and Inheritance' unit introduces the concept of genes and how they affect characteristics and cause variation within a species.

Pupils expand on their understanding of adaptation by recognising how adaptation over time leads to evolution. They research theories of evolution and learn about examples highlighting the concept of survival of the fittest. They revisit their learning about fossil formation and progress to identifying how fossils provide evidence for evolution. The 'All Living Things and Their Habitats' unit further develops pupils' ability to classify living things by observable characteristics, including micro-organisms. In the 'Electricity' unit, pupils associate the brightness of a lamp or the volume of a buzzer in a circuit with the voltage of cells. They continue to expand on their use of symbols for circuit components. The 'Light' unit helps pupils use the idea that light travels in straight lines to explain how objects are seen by emitting or reflecting light into the eye. They make predictions about the behaviour of light, including light sources, reflection, and shadows.

Impact

Through our science curriculum, students will develop the following skills and knowledge, ensuring they are well-prepared to explore the world scientifically and meet the National Curriculum standards:

- **Develop early scientific thinking:** Children in the Early Years Foundation Stage (Reception) will develop basic scientific thinking through practical and sensory-based learning activities.
- **Build a strong foundation:** Students will acquire key knowledge in biology as specified in the National Curriculum, covering areas such as Plants, Animals (including humans), Living things and their habitats, and Evolution and inheritance. The curriculum will provide students with essential chemistry knowledge, focusing on topics like Everyday materials, Uses of everyday materials, Properties and changes of materials, States of matter, and Rocks. Pupils will explore core physics topics, including Seasonal changes, Forces and magnets, Sound, Light, Electricity, and Earth and space, building a strong foundation in the subject.
- **Understand scientific methodologies:** Students will learn to evaluate and recognise the methods employed by practising scientists to formulate and investigate scientific questions.

- **Use scientific equipment effectively:** Pupils will be taught how to accurately use scientific tools and equipment to gather, measure, and record data with reliability.
- **Develop data representation skills:** The curriculum will enable students to effectively present and communicate data in various forms, including graphs, enhancing their ability to convey scientific information.
- **Analyse and interpret data:** Through the curriculum, pupils will develop the skills to analyse data, classify, group, and identify patterns, aiding their understanding of scientific concepts.
- **Draw conclusions from evidence:** Students will be guided to use evidence to develop explanations and draw reasoned conclusions from their investigations.
- **Enhance scientific literacy:** Pupils will demonstrate their understanding by articulating scientific concepts and ideas clearly, using appropriate scientific terminology.
- **Cultivate resilience and a growth mindset:** The curriculum will emphasise the importance of resilience and a growth mindset, particularly in the context of scientific investigations, helping students to persist through challenges.
- **Achieve national curriculum standards:** The curriculum is structured to ensure that pupils meet the end-of-key-stage expectations outlined in the National Curriculum for science.