PHEASEY PARK FARM
Primary School &
Early Years Centre

Science Subject Narrative

Science overview

Science programmes of study in the national curriculum are assigned to year groups. However, this is not compulsory and they must be covered before the end of the phase. Physics is not formally introduced until Key Stage 2. However, in Key Stage 1, children have opportunities to explore natural phenomena, such as shadows. At Pheasey Park Farm, the names of the science projects are matched to the national curriculum aspects, for example, Living things and their Habitats and Earth and Space. The science curriculum is sequenced to develop both children's substantive and declarative knowledge, and where possible, make meaningful links to other projects. For example, in Year 3, the Science topic Rocks is taught alongside the Art and Design project Ammonite. These links allow for children to embed their substantive knowledge and vocabulary in new and often real-life contexts. The sequencing of projects ensures that children have the substantive knowledge and vocabulary to comprehend subsequent projects fully. Each project's place in the year has also been carefully considered. For example, projects that involve growing plants or observing animals are positioned at a suitable time of year to give children the best possible opportunity to make first-hand observations. Year 1 revisit their seasonal changes learning throughout the year as the weather patterns change. In Year 4, States of Matter is taught before Sound so children can explore how sounds travel in different materials.

When designing the science curriculum, careful consideration was given to planning outdoor experiences and school trips to further embed children's understanding of taught concepts. Year 3 visit Dudley Zoo which complements their learning of Animals including Humans. Year 6 visit Barr Beacon, a local nature reserve, to work scientifically and deduce the biodiversity of the local area. English links have been made in Whole Class reading and English lessons, where possible. Year 2 look at the text Little People, Big Dreams to promote diversity and Year 4 study Flotsam which promotes discussion on the human impact of plastic pollution.

Within all the science projects, disciplinary knowledge is embedded within substantive content.

Throughout our science curriculum, there is complete coverage of all national curriculum programmes of study.

Key Stage 1

Year 1

In Year 1, children start the Autumn term with Seasonal Changes where they learn broadly about seasonal changes linked to weather, living things and day length. They revisit this learning throughout the year as new weather patterns emerge as each season changes. In Spring half term, children learn about Everyday Materials where they name and describe their properties. Children then move on to comparing and grouping these based on their physical properties. During Spring 2, Year 1 begin to learn about common, wild and garden plants, including deciduous and evergreen trees. By the end of the term, they can identify and describe the basic structure of a variety of common flowering plants, including trees. In the final term, Year 1 children identify and name common animals and can describe

and compare the structures of common animals (e.g. common body parts such as wings or fins). They also learn the basic parts of the human body and which sense links to which part.

Year 1 cross curricular links

Within Art and Design, children make collagraph prints based on the weather. Everyday Materials is further consolidated in the Shade and Shelter Design and Technology topic where the children are taught the purpose of shelters and their materials by designing their own. Children have a practical experience of the senses Chop, Slice and Mash where they learn to make a sandwich based on specific criteria.

Year 2

In Year 2, children begin the Autumn term with Animals including Humans, learning about the survival needs of humans, before expanding to study animals within their habitats. Building on learning from Year 1, children learn about the uses of materials in the Spring term and begin to understand changes of materials through simple physical manipulation, such as bending and twisting. In Summer, when learning about Plants, children observe what plants need to grow and stay healthy. Finally, in Summer 2, children bring together learning from the Autumn term, thinking about what animals need to survive.

Year 2 cross curricular links

In the Art topic Flower Head, children observe the shape, form and colour of flowers first-hand and carefully draw what they see. In the Design and Technology topic Remarkable Recipes, children apply their understanding of hygiene and handwashing to food hygiene, to ensure they are keeping their 'customer' safe. In Push and Pull, children manipulate materials to create their own product: a greeting card using mechanisms. Within English lessons, children explore the non-fiction text Little People Big Dreams to increase their knowledge of diverse, notable scientists.

Lower Key Stage 2

Year 3

In the Autumn term, the properties of materials are revisited in the projects Rocks and Forces and Magnets. In Autumn 1, children begin by comparing and grouping rocks and soils. In Autumn 2, children identify magnetic materials and learn about the non-contact force of magnetism. They also begin to learn about contact forces, investigating how things move over surfaces. Children then move on to learning about Light and Shadows, where they are explicitly introduced to the subject of light, with children learning about shadows and reflections, revisiting vocabulary from Key Stage 1, including opaque and transparent. Lastly, having learned about human body parts, the senses and survival in Key Stage 1, children now focus on specific body systems and nutrition in Key Stage 2. They learn about the skeletal and muscular system in the project Skeletal and Muscular Systems. This learning again links to other animals, with children identifying similarities and differences.

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Year 3 cross curricular links

Alongside their learning of the skeletal and muscular systems, children learn about healthy diets in the Design and Technology project Cook Well, Eat Well. In Ammonite, children explore the pattern and form of fossils and make prints based on these. In Beautiful Botanicals, children become botanical artists which allows them to revisit previous learning in KS1 about the structure and form of plants. In English, Year 3 explore The Firemaker's daughter and Ironman, allowing vocabulary to be further embedded.

Year 4

In Autumn 1, children study States of Matter where children learn about solids, liquids and gases and their characteristics. They understand how temperature drives change of state. In Autumn 2, children learn about the digestive system, again making comparisons to other animals. In the Spring term, children study electricity by creating and recording simple circuits and they also build on their knowledge of the properties of materials by identifying electrical conductors and insulators. In Summer 1, the concept of sound is introduced where children identify how sounds are made and how sound travels. They use vocabulary that they have previously encountered in Music lessons, such as pitch and volume, in a scientific application and identify properties of materials associated with these concepts. In the final half term, children move on to revisiting Living Things and their Habitats. Up to this point, children have had many opportunities for grouping and sorting living things. In Year 4, children recognise this as 'classification' and explore classification keys. As States of Matter is an integral concept, children revisit this within the Geography project Misty Mountain, Winding River, in which children learn about the water cycle.

Year 4 cross curricular links

In Fresh Food, Good Food, children design a healthy snack embedding their learning from LKS2 about nutrition and the digestive system. In English, Year 4 study the picture book Flotsam which facilitates the discussion on the human impact of plastic pollution. Children complete cross-curricular writing on this: a persuasive argument about plastic use and have previously written to Asda to request they reduce their use of plastic.

Upper Key Stage 2

Year 5

In Autumn 1, children revisit learning about contact and non-contact forces from their Y3 learning. They learn that gravity is a non-contact force of attraction and observe gravity firsthand. They also learn about mechanisms, including gears, pulleys and levers. In Autumn 2, children learn about Earth and Space and this is when they visit the Space Centre to supplement learning. They also develop their understanding of day and night, first explored in the Year 1 project Seasonal Changes.

In Spring term, children revisit the life cycles of vertebrates and invertebrates. They build on Y4 learning of mammals by exploring mammalian life cycles including the relationship between mass and gestation period, using this research to plot and interpret scatter graphs.

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In Summer term, children revisit much of their prior learning about materials' properties and learn new properties, including thermal conductivity and solubility. To this point, children have learned much about reversible changes in previous years, such as melting and freezing, but in Year 5, extend their learning to irreversible changes, including chemical changes.

Year 5 cross curricular links

In Moving Mechanism, children learn about pneumatics which consolidates their learning of mechanisms from previous year groups as well as revisiting their learning of States of Matter from Year 4. In Eat the Seasons, children learn about seasonality and revisit their learning of applying the principles of a healthy, varied diet.

Year 6

In the Autumn 1 project Light, children recognise that light travels in straight lines from a source or reflector to the eye and explain the shape of shadows. In Autumn 2, children also build on their knowledge about electrical circuits from Year 4, now learning and recording standard symbols for circuit components and investigating the function of components and the effects of voltage on a circuit. Science learning about classification is further embedded in Spring 1 where children explore the different kingdoms and begin to understand microorganisms. In Spring 2, the final body system children learn about is the circulatory system and its roles in transporting water, nutrients and gases. Finally, in the project Evolution and Inheritance, children learn about inheritance and understand why offspring are not identical to their parents. They also learn about natural selection and how this can lead to the evolution of a species.

Year 6 cross curricular links

Curriculum days are utilised for cross-curricular projects. In Autumn term, children create a puppet theatre using Light and Shadows to entertain younger children. Year 6 also design and create their own electrical board games by using conductors which revisits their learning from Year 4. In Food for Life, children embed the key learning that lifestyle choices can have an impact on the body, as they explore processed foods. In Art, within Bees, Beetles and Butterflies, children create artwork which is inspired by invertebrates.