

The Science Curriculum at Hindhayes - Knowledge Progression (Substantive Knowledge)



Hooked on Thinking

Working With and For Local Families

Recent research shows us that: Science is a core subject and therefore provision should be equally as strong and frequent as literacy and maths. (Ofsted, 2019). There is currently an attainment gap in science at every stage: it is apparent at the end of KS1 and gets wider through primary and secondary education with the gap growing particularly strongly between the ages of 5-7. Strongest factor affecting pupils science is their literacy skills (difficulties understanding vocabulary in particular). There is strong evidence that the ability to reason scientifically – by having sound ‘working scientifically’ skills – is a strong predictor of later success in science. Pupils should therefore have ample opportunity to design and carry out their own experiments and investigations (EEF, 2019).

Developing Science teaching and learning at Hindhayes - Use of floorbooks (Spring 2020) Whole CLP Science project (2020-2022) Staff meetings focussing on curriculum development / coverage Outside providers to support Cultural Capital in science (e.g. STEM project, Bubbles Workshop, Life bus).

Pupils should be taught to:	Development of skills	Foundation Stage	Year 1	Year 2	Further Primary Outcomes
Work Scientifically	Please see separate skills progression for working scientifically.	Please see separate skills progression for working scientifically.	Please see separate skills progression for working scientifically.	Please see separate skills progression for working scientifically.	Please see separate skills progression for working scientifically.
Plants Identify and name a variety of common wild and garden plants, including deciduous and evergreen trees Identify and describe the basic structure of a variety of common flowering plants including trees. Observe and describe how seeds and bulbs grow into mature plants Find out and describe how plants need water, light and a suitable temperature to grow	Scientists in the Foundation Stage will: have hands on experience of planting seeds (e.g. broad beans / cress) in the Spring and watching them grow over a period of time. This has, in the past, been linked to a T4W story e.g. Jaspers Beanstalk or The Enormous Turnip. Classes keep basic photographic ‘bean diaries’ (drawing and photographing what our plants look like) and continuous provision encourages children to make simple observations of plants – based around language. The play worker engages children in maintaining the planting pots in the outdoor area and looking at basic seasonality with plants. Forest school teaching promotes observation of some of the trees and plants in our locality – children learn the names of some common plants and make basic observations of them. Children talk about growth, decay and changes over time.	Scientists in Year 1 will: explore the school grounds and become familiar with a variety of native trees, plants and flowers growing in their immediate environment. They will start to label the basic structure of a plant. Children will have opportunities for hands-on planting and growing e.g. cress, sunflower seeds and broad beans.	Scientists in Year 2 will: continue to consolidate learning from Year 1 by labelling plant structures and becoming familiar with a range of common plants. They will describe what plants need in order to grow. They will extend their learning by carrying out simple investigations to find the “optimum” conditions needed for plant growth and will be able to explain why plants grow better in certain conditions.	Scientists in Year 3 will: Identify and describe the functions of parts of flowering plants (roots, stem/trunk, leaves and flowers). They will explore the requirements for plants for life and growth in more detail (air, light, water, soil nutrients) and how they vary from plant to plant. They will investigate how water is transported within plants. They will explore the part that flowers play in the life cycle of flowering plants (pollination, seed formation and seed disposal).	
Animals, Including Humans Identify and name a variety of common animals including fish, amphibians, reptiles birds and mammals Identify and name carnivores, herbivores and omnivores. Describe and compare the structure of common animals. Identify, name, draw and label the basic parts of the human body and talk about the senses. Notice that animals have offspring Describe the basic needs of animals for survival Describe the importance of humans for exercise, diet and hygiene.	Scientists in the Foundation Stage will: have the chance to learn about a range of animals including farm animals, nocturnal animals, sea creatures and wild animals over the year, through carefully selected topics and Talk for Writing stories, children. Children learn rhymes and stories about different animals. Children look at simple life cycles e.g. caterpillars & frogs and observe changes. Through PSED & P.E. children begin to lean about their bodies and a topic of “ourselves” is usually covered at the start of the year. Children explore their senses through continuous provision activities linked to Keeping Healthy – this often involves tasting new foods, and cooking as well as basic self care activities e.g. teeth brushing / hand washing. Children learn about how to care for animals and plants in forest school. Children show care and concern for living things in the environment.	Scientists in Year 1 will: learn about a range of common animals in cross-curricular work and be able to sort them into categories. They will use basic language e.g. ‘scales’ or ‘fur’ (see ASE Plan resources) to describe and compare animals. Year 1 children will build on the basic knowledge of their senses by carrying out simple hands-on learning e.g. senses walks / taste tests.	Scientists in Year 2 will: Look at a range of animals from different classification groups and be able to describe their needs for survival. Through cross-curricular learning and P.E. children will be able to describe the importance of exercise and keeping themselves healthy.	Scientists in Year 3 will: Identify that animals and humans need the right types of nutrition and where they get nutrition from. Scientists in Year 5 will: Describe differences in life cycles and describe the life processes of reproduction in some plants and animals. Scientists in Year 6 will: Recognise the impact of diet, exercise, drugs and lifestyle on the way their bodies function.	
Everyday Materials Compare and group together a variety of common everyday materials based on their properties. Distinguish between natural and man made materials. Identify and name common materials e.g. wood, glass. Describe the simple properties of materials. Identify and compare the suitability of a variety of everyday materials Find out how the shapes of solid objects made from materials can be changed by squashing, bending, twisting etc.	Scientists in the Foundation Stage will: learn about simple materials through exploring different media and materials. They begin to talk about the texture of things and their suitability for a particularly purpose e.g. making a boat. Children construct with a range of different materials and have access to a wide variety of resources to create things with in the classroom.	Scientists in Year 1 will: explore different materials through hands on experiences e.g. D&T. They will look at materials around the school and be able to talk, in simple terms, about their properties e.g. hard, stretchy etc. Children will sort materials into basic categories.	Scientists in Year 2 will: Consolidate their understanding of materials from Year 1. Opportunities are provided for children to explore the suitability of different materials e.g. “What material is best to make an umbrella?” Children are encouraged to reflect on the use of materials in their cross-curricular learning to think about their suitability for purpose.	Scientists in Year 3 will: Compare and group together different kinds of rocks on the basis of their simple properties. Notice that some forces need contact between two objects, but magnetic forces can act at a distance. Scientists in Year 5 will: Compare and group everyday materials on the basis of their properties (hardness, solubility, transparency, conductivity, magnetism). They will conduct fair tests to reason about the particular uses of everyday materials.	
Seasonal Changes Observe changes across the four seasons Observe and describe weather associated with the seasons and how day length varies.	Scientists in the Foundation Stage will: learn about the seasons through high quality continuous provision – often linked to stories / art. They comment and ask questions about their familiar environments and develop a basic understanding of change over time. Children look at all 4 seasons, weather patterns and the natural world during the seasons. Daily talk time will often focus on the weather or season. Children have the opportunity to explore different seasonal weathers outdoors e.g. ice play, mud kitchen, autumn scavenger hunts etc.	Scientists in Year 1 will: visit teaching on the 4 seasons at regular intervals throughout the year. Forest School will support children to recognise and describe seasonal changes and be exposed to different types of weather.		Scientists in Year 3 will: Recognise that light from the sun can be dangerous and that there are ways to protect our eyes. Scientists in Year 5 will: Use the idea of the Earth’s natural rotation to explain day and night and the apparent movement of the sun across the sky.	
Living things and their habitats Compare the difference between things that are living, dead or have never been alive. Identify how habitats provide for the basic needs of animals and plants. Identify and name a variety of plants and animals in their habitats. Describe how animals obtain their food from plants and other animals using the idea of a simple food chain.			Scientists in Year 2 will: Use the school environment (e.g. the school pond & forest school) to learn about habitats for animals and minibeasts, linking this to basic food chains. Be introduced to the language of ‘predator’ and ‘prey’ and begin to explain why certain animals are suited to their habitats. Explore the difference between things that are living, dead or have never been alive using the ‘MRS NERG’ acronym. Use these criteria to sort things that are living, dead or have never been alive.	Scientists in Year 4 will: Recognise how to group living things in a variety of ways. Explore and use classification keys. Recognise that environments can change and how this poses dangers to living things. Construct and interpret a variety of food chains and identify predators and prey.	