

## Science Curriculum at Woodvale Primary Academy

### Intent:

We believe that our pupils deserve to benefit from a strong foundational knowledge of all three aspects of the Science curriculum: Biology, Chemistry and Physics.

We want our pupils to aspire to achieve their goals and by offering a well-rounded Science curriculum, we hope that this will allow our pupils to have access to whichever area that their interest lies.

We want our pupils to be able to use the knowledge and skills they gain in Science to confidently talk about 'what is occurring, predict how things will behave and analyse causes' (National Curriculum 2014) and then use these skills in the wider world.

By providing the children with a well-rounded and interesting Science curriculum that promotes cross-curricular links this will encourage the children to apply their knowledge and skills in different areas of the curriculum and to always be inquisitive.

When looking at the content of the Science curriculum we believe that a thorough knowledge base of how all living organisms operate as well as a deep understanding of different materials and types of energy, will hopefully foster a need in our pupils to care for the world around them.

In our school, we believe that our children deserve a curriculum that is rooted in rich learning experiences that develop knowledge and skills, where connections are made between and within subjects and where each discipline is given equal status.

We use the National Curriculum alongside the Cornerstones Curriculum, which offers the children lots of opportunity for hands-on practical experiences as well as offering cross-curricular links with other subjects as part of a thematic learning approach.

Our science curriculum is planned based on these key concepts:

- **Working Scientifically:** The understanding that there is so much we can learn about the world that we must always question and analyse the world around us to deepen our understanding and that the world is always changing so we are always learning.
- **Living Things-** There is a wide variety of living things (organisms), including plants and animals. They are distinguished from non-living things by their ability to move, reproduce and react to certain stimuli. To survive they need water, air, food, a way of getting rid of waste and an environment which stays within a particular range of temperature.

- Evolution and Inheritance: The understanding that genetic information is passed down from one generation of organisms to another and that the diversity of these organisms is the result of evolution.
- Materials: The knowledge that everything has properties that allow it to be categorised.
- Energy: That the total amount of energy in the Universe is always the same but can be transferred from one from one energy store to another during an event.
- Forces and Magnets: That objects can affect other objects at a distance and changing the movement of an object requires a net force to be acting on it.
- Earth & Space: The knowledge that our solar system is a very small part of one of billions of galaxies in the Universe.

### **Implementation:**

#### **Medium term planning:**

Teachers medium term plans are linked to Cornerstones Curriculum units, these also offer the opportunity for cross-curricular links which we feel are beneficial for children as it helps them to build their mental models if learning is interlinked.

#### **Knowledge organisers:**

For each of our thematic units the children have access to knowledge organisers which enable them to learn and retain the important vocabulary and knowledge in each unit.

#### **Science investigations & Working Scientifically:**

Linked to our thematic units are our Science investigations which offer our children the practical hands-on experiences that will help to further solidify their scientific knowledge as well as their scientific skills. The aim then is for these children to then apply these scientific skills to other areas of learning for example skills learnt in Maths will often be applied in Science investigations and vice versa.

#### **Vocabulary:**

As a school we are committed to ensuring the children leave us with a wide vocabulary and Science plays a key part in this due to the amount of high-level terminology that the children will need to know and then use within their Science lessons and wider curriculum. From the Early Years where children participate in discrete vocabulary centred activities with the aim of building a strong foundation of language, then carrying on throughout the school where new vocabulary is introduced in all lessons, we aim to support the children in first understanding and then applying the vocabulary that they learn.

For each unit of work as previously mentioned there is an associated knowledge organiser which sets out the key vocabulary for that unit. Alongside this we also have a separate vocabulary list which covers all the units within the National Curriculum programmes of study for Science.

### **Enrichment activities:**

At Woodvale we value the significant impact that outdoor learning has on physical development, communication and mental wellbeing. We want our outdoor space to be used as the valuable tool that it is which is why within our Science planning, we aim to offer our children the opportunity to learn outside through hands on experiences.

### **Impact:**

Through providing a broad but balanced Science curriculum our aim is for children to reach their age-related expectations at the end of their cohort year.

Children will be able to use the skills they have learnt to question, work collaboratively to investigate and will be able to use scientific vocabulary to explain the process they have taken and reason scientifically.

As part of our key concepts for Science we also have a set of end points which we aim for children to meet by the time they come to the end of their schooling with us in Year 6:

Children will demonstrate an understanding that science is a search to explain and understand phenomena in the natural world. There is no single scientific method for doing this; the diversity of natural phenomena requires a diversity of methods and instruments to generate and test scientific explanations.

Children will have a strong understanding of all living things and the skills to compare, contrast and discuss in detail using a sound scientific vocabulary.

Children will demonstrate an understanding that genetic information is passed from one generation of organisms to another and that the diversity of organisms, living and extinct, is the result of evolution.

Children will be able to use their scientific knowledge to categorise different materials according to their properties and that the state of different matter can be changed by heating or cooling them.

Children will have a solid knowledge of different types of energy and that energy can be transferred but not created or destroyed.

Children will be able to talk about the effect objects can have on other objects using scientific vocabulary, this will include talking about magnetic, electric or gravitational fields. Children will demonstrate an understanding that gravity is a universal attraction between all objects however large or small, keeping the planets in orbit round the Sun and causing terrestrial objects to fall towards the centre of the Earth.

Children can use scientific language to talk about our solar system and about our place in the wider universe. Children will also demonstrate an understanding of how day and night and the seasons are explained by the orientation and rotation of the Earth as it moves round the Sun.