



### Exploration Policy

#### Introduction

This policy defines exploration and clarifies our understanding of this curriculum area as the foundation for developing mathematical and scientific understanding. It will describe the approach to enabling pupil development and the assessment of that development.

Exploration can be defined as the search for pattern and order in the world. Children develop understanding of the world around them through experiences of similarities, differences, patterns and changes. At Stephen Hawking School we believe that development of exploration skills is fundamental to the development of understanding of the physical world.

In the early stages of learning, pupils may encounter exploration experiences, which are structured by the adults around them. This structure may include the pace at which new experiences are introduced, the way in which those experiences are managed, the role of the adult and the strategies employed. Children at these early stages of learning may begin their development of exploration skills using a limited range of materials, with frequent repetitions and a framework that provides routine to that experience. Familiarity with the materials will raise the child's awareness. Through raised awareness children will begin to differentiate responses within different exploration experiences.

Throughout the early stages, the adult may be supporting the child to explore with a purpose. As the pupil progresses to responding, coactively exploring and independently exploring experiences, the role of the adult moves from physical support to verbal support, where the adult narrates or provides a commentary to the pupil's exploration experience. It is through the adult support that pupil's exploration experiences are guided to become mathematical or scientific experiences, enabling pupils to develop ideas that form the basis for future learning within maths and science.

#### Legal Requirements

At Stephen Hawking School, exploration encompasses the National Curriculum for science and maths. All the children at Stephen Hawking School are working below the National Curriculum, with the vast majority working at pre-subject specific level. In mathematics we will focus on number, shape, space (geometry) and measure along with children making choices and comparisons (statistics, ration and proportion and algebra). Aspects of the science curriculum will be taught via a topic approach, with the topic changing every term. The programmes of study for science in the National Curriculum

2013 will continue to be grouped under the heading used in the National Curriculum 2000 as it is felt that these areas allow a best fit approach via topics and are more appropriate when teaching children working at pre-subject specific level.

## **Aims & Objectives**

### **Mathematics**

The mathematics curriculum aims to provide pupils with the opportunity:

- To manipulate concrete materials in order to acquire sound mathematical concepts
- To use the understanding of pattern, space, shape and number to develop problem solving skills
- To encourage the development of language and communication
- To enjoy experiences and activities which encompass a range of activities which allow for different rates of mathematical development
- For different modes of learning – doing, observation, communicating, listening
- For individual and cooperative work.

### **Science**

The Science Curriculum aims to:

#### Scientific enquiry

- Pupils will be able to ask questions, predict and hypothesise
- Pupils will be able to observe, measure and manipulate variables e.g. changing one variable whilst keeping the other the same allowing for a fair test
- Pupils will interpret their results and evaluate scientific evidence

#### Life Processes and Living things

- Pupils will find out about themselves and about how they grow, feed, move and use their senses
- Pupils will know something about the stages of human development
- Pupils will be able to sort living things into broad groups according to similarities and differences using observable features

Understand that the weather changes and the impact on humans and other animals

- Pupils will understand about the basic requirements for life
- Pupils will understand that they are part of a wider environment, including earth and space

## Materials and their properties

- Pupils will be able to collect and find similarities and differences between everyday materials
- Pupils will understand that materials have different properties e.g. hard and soft and that these properties can be used for different things
- Pupils will know that joining one material with another can change the properties.

## Physical Processes

- Pupils will know that light and sound come from different sources
- Pupils will know that different forces allow things to move at different speeds
- Pupils will understand that different forces can be used to move different objects
- Pupils will understand that electricity comes from a source and that it can be used by man to power things

## Implementation

### The Curriculum – Exploration

Pupils need to have had extensive opportunities to build up their experience in exploration. They also need to develop their curiosity and investigative skills. Pupils with profound and multiple learning difficulties require frequent exploration opportunities and they require a lot of adult support and modelling in order for them to gain these skills. Three developmental stages describe this progress:

As pupils develop their exploration skills using a range of materials, they are supported to engage in co-active exploration, and experience frequent repetition of activities, they are being provided with the foundation to develop an awareness of difference and change. In order for pupils to develop this awareness, adults need to limit the range of materials at first, encourage pupils to explore materials in different ways and observe pupils' reactions.

This awareness becomes the basis for children's curiosity, they begin to be more proactive in their interactions, remembering learned responses over longer periods, exploring in more complex ways, and applying potential solutions systematically to problems. In order to encourage pupils to become more proactive in their interactions, adults need to be aware of their likes and dislikes and to support them to make simple choices.

At this stage of development, pupils are ready to use their experience in exploration and their curiosity to engage in simple scientific investigations. They are able to match and sort objects into single features or properties. Later on, they begin to make generalisations, connections and predictions from their regular experiences.

The exploration curriculum in KS1 and KS2 is wholly topic based and largely timetabled. The activities will change at least termly.

The exploration curriculum aims to provide pupils with the opportunity:

- To develop an awareness of, and interest in, themselves and their environment
- For pupils to receive appropriate support for their individual level of exploration development

### The Curriculum – Mathematics.

QCA guidance (2009) states that 'mathematics is vital to everyday life as it encourages logical reasoning' through the application of the skills of making comparisons, identifying differences, investigating relationships and establishing connections'.

At KS1 and KS2 the mathematics curriculum is planned in accordance with the Numeracy Strategy. Objectives have been identified within the five strands – using and applying (problem solving), number, shape, space, measure. The Stephen Hawking objectives are viewed as end of key stage targets, with each target comprising several objectives or small steps achievable by pupils working at P4 or above.

Mathematics is taught as a discrete subject at KS1 and KS2. However, we do recognise that language plays an essential part in the formation and expression of mathematical ideas and it is important that every opportunity to develop pupil's skills in understanding and using related language is taken. This means that mathematical concepts may be part of every daily routine – the daily timetable (concepts of time); what's next (ordering and sequencing events); have we got enough plates at snack time (problem solving); art – is this paper too big (concepts of measure).

### **The Curriculum – Science**

QCA (2009) states that "science gives all pupils the opportunity to think and learn, and develop an interest in, and curiosity about, the world around them through exploratory and investigative experiences and activities."

Research has shown that children learn best in science when they are engaged in practical activities when these activities are based on pupils existing ideas about the world. From this it has been suggested that Science teaching may involve the following phases:

- orientation – the teacher sets the scene and seeks to arouse learners' interest and curiosity
- elicitation – the teacher helps learners find out, clarify and share, what they already think (structuring their existing ideas)
- intervention – the teacher encourages learners to test their ideas, to extend, develop and replace them (restructuring their understanding)
- review – the teacher helps learners recognise the significance of what they have found out/ learnt and how
- Application – the teacher helps learners to relate what they have learned to their everyday lives.

At Stephen Hawking School Science will be introduced initially by looking at practical situations in the context of familiar environments such as the school, the home and familiar aspects of the local environment. Initially by the use of concrete experiences, starting with materials the pupils understand and then by building on this knowledge using the phases suggested earlier.

### **Assessment**

The vast majority of children at Stephen Hawking School will have learning targets relating to Exploration. For some children working at very low developmental levels exploration work may be defined by other aspects of the curriculum, specifically communication.

Some children, when working at subject specific level, may have specific science or mathematics targets, for example, to understand that babies grow into adults.

Assessment of these learning targets will be via observation of children's work or, in very unusual cases, testing to see if they understand a specific concept.

Assessment is in line with the school's Assessment, Recording and Reporting policy using school, commercially produced and national systems.

### **Exploration within the Early Years Foundation Stage.**

The statutory framework for the EYFS identifies 3 areas of effective teaching and learning, these are: Playing and Exploring, Active Learning, and Creating and Thinking Critically.

In relation to scientific and mathematical learning, Stephen Hawking School acknowledges the importance of and the relevance to the following areas of the EYFS Development Matters Characteristics of Effective Learning:

#### **Playing and Exploring:**

- **Finding out and Exploring**
  - Showing curiosity about objects, events and people
  - Using senses to explore the world around them

#### **Creating and thinking critically:**

- **Having their own ideas**
  - Thinking of ideas
  - Finding ways to solve problems
- **Making links**
  - Making links and noticing patterns in their experience
  - Making predictions
  - Testing their ideas
  - Developing ideas of grouping, sequences, cause and effect
- **Choosing ways to do things**
  - Planning, making decisions about how to approach a task, solve a problem and reach a goal

When children are furnished with opportunities to explore in their own way and in their own time, children gain awareness of the world around them and how their actions can cause an effect on their own environment.

#### **Science:**

Within the EYFS, science is taught as part of the Specific Area, "Understanding the World: The World" and within the Prime Areas of Physical Development and Communication.

#### **Maths:**

Within the EYFS mathematics is identified as a Specific Area and has strands related to number and to shape, space and measures. Maths is also taught within the Prime Areas of Physical Development and Communication.

Opportunities for exploring and investigating early mathematical and scientific concepts are through play based learning that is planned through thematic topics that capitalise on children's interests and previous experiences. There is a strong focus on the use of consistent routines and mini-routines within the EYFS which support the development of concepts such as matching and sequencing which encompass both scientific and mathematical learning. All opportunities for learning are planned through thematic topics. See summary below.

### **Early Years Foundation Stage Topics**

	Autumn: me	Spring: growth and change	Summer: the world around me
Cycle 1	My body	The weather	Shopping/the supermarket
Cycle 2	My senses	Growing seeds and plants	London transport
Cycle 3	My Family	Cooking	The park/garden

### **Review**

This policy will be reviewed in line with the school's agreed review schedule.