Tower Hill Primary School
Science Rationale

Intent:
At Tower Hill Primary School our core vision is that ALL children will be equipped with the skills, knowledge, understanding and empathy that will lead to them being able to make their own choices in life, successfully. With this at the forefront of our minds and the understanding that the Science Curriculum should inspire in pupils a curiosity and fascination about the world, we aim to deliver the Scientific subject knowledge and skills through engaging, exciting and relevant opportunities. Our curriculum focuses on the key skills of exploration, enquiry, investigation and experimentation. Through careful planning, we ensure that the three areas of Knowledge, Understanding and Scientific Enquiry are balanced to allow children to progress in order to gain a sound comprehension of the subject and understanding of their world. We believe the learning of Science provides a valuable, hands-on, interactive and memorable educational experience for all pupils so that they retain the knowledge that they learn and leave Tower Hill suitably prepared for Key Stage 3. We strive for all children to be actively engaged in their own learning, to be motivated and eager, to achieve and attain to their own full potential within this subject.

Implementation:
Tower Hill's Science Curriculum incorporates fundamental Scientific knowledge and skills, allowing pupils to build on these from year to year from Early Years through to KSII. Through the implementation of our Science Curriculum, learning should be consolidated and built upon each year, ensuring that the children make good progress and leave each phase of their learning with the relevant skills, knowledge and understanding.

Early Years: In the Early Years Foundation Stage Curriculum, 'Understanding the World; The World' encompasses aspects of Geography learning but is predominantly focussed on Scientific enquiry and exploration. The Early Learning Goal states that children should: know about similarities and differences in relation to places, objects, materials and living things. They make observations of animals and plants and explain why some things occur, and talk about changes. The Exceeding statements go on to cover Scientific concepts in greater depth including floating, sinking and experimentation. Opportunities to access these objectives are facilitated through both continuous and enhanced provision throughout our child-initiated play environment as well as in adult-led group activities.

Key Stage I:
The National Curriculum states that the principal focus of Science teaching in KSI is: to enable pupils to experience and observe phenomena, looking more closely at the natural and humanly-constructed world around them. They should be encouraged to be curious and ask questions about what they notice. They should be helped to develop their understanding of scientific ideas by using different types of scientific enquiry to answer their own questions, including observing changes over a period of time, noticing patterns, grouping and classifying things, carrying out simple comparative tests, and finding things out using secondary sources of information. They should begin to use simple scientific language to talk about what they have found out and communicate their ideas to a range of audiences in a variety of ways. Most of the learning about

science should be done through the use of first-hand practical experiences, but there should also be some use of appropriate secondary sources, such as books, photographs and videos.

In **Year 1**, children begin their Scientific study by exploring further, what is familiar and relevant to them; allowing them to draw on their personal experience of their world. They start to look at '**Seasonal Changes**' which links effectively with their Geographical study of their locality at this time. Their observations of 'Seasonal Changes' then develops naturally throughout the year.

The strand of '**Animals including Humans**' runs throughout Key Stage I, with Year 1 learning to name and identify human body parts, their uses and senses and also identify and name a range of common animals including classification into different groups including carnivore, herbivore and omnivore and fish, bird, reptile, mammal and amphibian. This learning progresses further in Year 2 by children learning how to keep the body healthy, what mammals need to survive, the growth and development cycle of humans and the food chain of animals. They also go on to study **'Living Things and their Habitats'.** The study of **'Plants'** progresses similarly across the Key Stage with our younger learners beginning by identifying and naming common wild and garden plants including their structures, and later observing and describing how seeds and bulbs develop into mature plants and the factors they need to survive and thrive.

The study of **'Everyday Materials'** begins in Year 1, with children learning to distinguish between a range of different materials; identifying, naming, grouping and describing them based on simple physical properties. Progression then leads them to identifying and comparing the suitability of these materials for particular uses in Year 2, and by finding out how the shape of different solid materials can be changed.

We strongly believe that the children learn best when they are actively involved and with this in mind, all year groups participate in practical experimentation starting with exploring the school grounds and their immediate locality and later undertaking investigations and observations in relation to materials and plants.

Key Stage II:

The National Curriculum states that the principal focus of Science teaching in KSI is: to enable pupils to develop a deeper understanding of a wide range of scientific ideas. They should do this through exploring and talking about their ideas; asking their own questions about scientific phenomena and analysing functions, relationships and interactions more systematically. They should begin to encounter more abstract ideas and recognise how these instead help them to understand and predict how the world operates.

Our Key Stage II curriculum is separated into the following key strands: '**Plants**', '**Animals and Living Things**', '**Light**', '**Sound**', '**Electricity**', '**States of Matter**', '**Forces and Magnets**', '**Rocks, Soils and Fossils**', '**Earth and Space**' and '**Evolution and Inheritance**'. While few of these topics are explored just once in the span of the Key Stage, many of our units are revisited to give pupils the opportunity to study the strand in both lower and upper Key Stage II. This enables children to retain and apply their previous learning and further build on their knowledge and skills in this area.

It is possible to see how and specifically when, these strands are mapped out across the year groups from our '*Tower Hill Curriculum Overview*'. It is important that in addition to the

knowledge learnt through these topics, that '**Working Scientifically'** skills are embedded and built upon through every unit. In **Years 3 and 4**, children will be encouraged to ask questions about scientific concepts and then carry out experiments to find out the answers. In doing this they will; learn what a 'fair test' is, take measurements from a range of equipment, gather and record data and report their findings, orally and in writing. In **Years 5 and 6**, children will continue to practise the above skills, but with more depth and precision. When carrying out experiments they will; understand what variables are and how to control them, take measurements from a range of equipment, understanding the need for repeated measures to increase accuracy, gather and record data using labels, classification keys, tables, scatter graphs, bar and line graphs, use test results to make further predictions to set up further comparative and fair tests and make conclusions on the tests carried out, orally and in writing. Further detail on the progression of each individual strand, can be seen in a separate document *'Science Progression of Skills'*. As in Key Stage I, it is at the centre of our vision to give pupils regular opportunities, in every topic, to apply and explore their learning practically through a range of experiments and investigations, many of which, in Key Stage II, the children plan and design themselves.

Impact:

In Science, we assess the impact of the curriculum on our learners in a number of ways. Firstly, we strive to ensure that our children's attainment in this subject is in line with or exceeding Age Related Expectations. Secondly, we administer 'End of Topic tests' at intervals throughout each year, which are short, summative assessments written in line with curriculum objectives and our planning. These test results form another source of evidence to support teachers in making accurate teacher assessments. Our children should be able to retain what they learn, enabling them to be ready for the next phase of their learning, ready to build further upon their Scientific Skills and Knowledge. We also assess the impact of our teaching through the children's ability to approach new learning and apply skills and knowledge to new situations. We encourage and promote independence and resilience in order for children to take control of their learning.