Tower Hill Primary School
Maths 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. The intent of our Mathematics Curriculum is to design a curriculum, which is accessible to all and will maximise the development of every child's ability and academic achievement. We believe Mathematics is a tool for everyday life. Mathematics teaches us how to make sense of the world around us through developing a child's ability to calculate, communicate, reason and to solve problems. We endeavor to ensure all children become fluent in the fundamentals of mathematics so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.

We deliver lessons that are creative and engaging. We want children to make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems using a Concrete, Pictorial, into Abstract approach.

We intend for our pupils to be able to apply their mathematical knowledge to Science and across a range of other subjects. We want children to recognise that Mathematics has developed over centuries and has been the fundamental basis for huge advances in Science, Engineering, Technology and Sport.

We believe in making mathematical learning come alive amidst a real life context and endeavour to make sure that the children realise the subject is essential to everyday life and financial literacy. Irrespective of year group, we want our children to have the ability to reason mathematically, have an appreciation of the beauty and power of mathematics, whilst embracing a sense of enjoyment and curiosity about the subject. **We strive for all to be actively engaged in their own learning, to be motivated and eager, to achieve and attain to their own full potential in Mathematics**

Implementation:

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

At Tower Hill each class teacher is responsible for the mathematics in their class in consultation with and with guidance from the Mathematics Leader. The class teachers use a common planning format on which to plan their daily lessons and the learning objective and success criteria is present in every lesson.

Class teachers must ensure that when planning, children are given the opportunity to carry out problem solving activities each week, related to the mathematics topic they have been learning about. This could be in the form of an open ended/Rich Maths Task.

All mathematics lessons are differentiated to support all levels of learners including children who find mathematics difficult whilst also providing appropriate challenges for children who are high achievers in mathematics. When additional support staff are available to support groups or individual children, they work collaboratively with the class teacher.

During Mathematics lessons at Tower Hill Primary School, through careful planning and preparation, we aim to ensure that throughout the school children are given opportunities for:

- A Concrete, Pictorial and Abstract Approach
- Problem solving.
- Individual, group and whole class activities and discussions.
- Open ended and closed tasks.
- A range of methods for calculating dependent on ability and type of task.
- Working with computers as a mathematical tool.
- Directly working with a teacher or a learning support assistant.
- The use of high quality maths language

Early Years:

Teaching and learning promotes social skills and develops the mathematical understanding of young children through: observation of number and pattern in the environment and daily routines, board games, large and small construction, stories, songs, rhymes and finger games, sand and water play, two and three dimensional work with a range of materials, imaginative play, cooking and shopping, outdoor play and playground games.

By the end of Early Years the children should be prepared for the dedicated mathematics lesson of approximately 45 minutes.

Key Stage I:

The principal focus of mathematics teaching in Key Stage I is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the 4 operations, including with practical resources [for example, concrete objects and measuring tools].

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practise at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage I.

Lower Key Stage II:

The principal focus of mathematics teaching in Lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the 4 operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of Year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word-reading knowledge and their knowledge of spelling.

Upper Key Stage II:

The principal focus of mathematics teaching in Upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching

should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of Year 6, pupils should be fluent in written methods for all 4 operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Pupils should read, spell and pronounce mathematical vocabulary correctly.

Impact:

In Maths, we monitor and assess the impact of the curriculum on our learners in a number of ways. Monitoring will take place by the class teacher, subject leader and head teacher on a regular basis in the form of observations, data analysis, pupil progress meetings, work sampling and pupil conferencing.

Assessment will be a key part of every lesson. The teacher will share the objectives for the lesson with the children and make sure they are clear what is being expected of them to successfully achieve the objective. Children will then self-assess at the end of a lesson using the Success Criteria. The short term assessment will also involve the teacher checking the children's understanding at the end of the session to inform future planning and lessons. Formative assessment will take place throughout the year and will take the form of the PUMA termly mathematics tests. The results of these tests will also be reported to the Maths Managers and Senior Leadership Team for analysis.

Ultimately, the Impact of Tower Hill's Maths curriculum will be measured in the children's attitudes to Mathematics alongside outcomes for learners across the school but particularly in the nationally released data at EYFS, KSI, Year 4 MTC and KSII SATS.