

Curriculum Statement - Mathematics



"Pure mathematics is, in its way, the poetry of logical ideas."
Albert Einstein

"No employment can be managed without arithmetic, no mechanical invention without geometry."
Benjamin Franklin

Introduction

Mathematics is about thinking and describing, analysing and creating – it has changed the world. It can stimulate moments of awe and wonder as learners notice a connection or pattern for the first time. It encourages independence and the ability to make decisions based on evidence, reasoning and logic. We want pupils at Ivy Bank Primary school to experience the enjoyment of mathematics and cultivate a sense of curiosity about the subject whilst developing a clear understanding.

Every pupil has a statutory entitlement to learn Mathematics and at Ivy Bank we want to ensure all pupils have the opportunity to become the best mathematicians they can. We want our pupils to be numerically able but also keen problem solvers and keen thinkers.

Intention

At Ivy Bank Primary School we aim to foster positive can do attitudes and we promote the fact that 'We can all do Maths!' We want all children to have the opportunity to achieve in Mathematics and teach for secure and deep understanding of mathematical concepts through small manageable steps. Problem solving is an essential part of learning and we provide challenge through rich and sophisticated problems. Mistakes made in our school are seen as learning opportunities and the children are not afraid to have a go. At our school, the majority of children will be taught the content from their year group only. They will spend time becoming true masters of that content, applying it and building on their previous knowledge.

We aim for all pupils to:

- Have a solid, concrete understanding of subject knowledge and skills.
- Be able to solve problems by applying their mathematical knowledge to a variety of problems, including in unfamiliar contexts and real-life scenarios.
- Reason mathematically by following a line of enquiry and develop and present a justification, argument or proof using correct mathematical language.
- Have an appreciation of number and number operations, which enables mental calculations and written procedures to be performed efficiently, fluently and accurately allowing children to be successful in Mathematics.

Implementation

The teaching of Mathematics follows the NCETM Prioritisation Documents and EYFS Development Matters. There is a clear progression of knowledge and skills through the years and allows opportunity to support any gaps in learning. These skills and knowledge is built on year by year and sequenced appropriately to maximise

learning for our children. All learning is relevant and linked to real life situations when possible and nothing is taught without a clear purpose.

At Ivy Bank Primary School:

- We aim to teach all children together within their class most of the time in Reception to Year 6. With the opportunity to support any gaps in learning when necessary. In certain circumstances, some children might need to access their own individual curriculum for maths but this will be clearly linked to their EHCP or PDR documents.
- Teachers use the NCETM Prioritisation Documents to support the teaching of maths in Year 1 to Year 6. These documents form a starting point from which teachers can adapt lessons to ensure learning is appropriate for their class.
- Each teacher will put in place immediate intervention to keep all children on track and able to access their year groups learning where possible.
- Children who need it are given additional support over shorter, more intense periods (for example over a day or week). This would include both gifted children and lower attaining pupils.
- Within lessons, children are given the opportunity to discuss deep thinking questions to encourage mathematical reasoning.
- Mistakes made by the pupils are used as learning opportunities and the children are not afraid to get things wrong but rather have a go.
- To monitor progress teachers use daily, weekly or end of unit reviews (within teaching) with three formal tests over the year to monitor progress and attainment.

Maths lessons at Ivy Bank Primary School will follow this teaching cycle (which may last one lesson or several lessons depending on the children’s needs):

- Hook Question
- Building up the foundations of an area of learning through the use of spinning questions.
- Manipulation
- Reasoning/Mathematical thinking
- Application/Challenge

This approach is seen as good practice and is seen as the best way to deliver the new national curriculum.

<u>Rule of Law</u>	In Mathematics, children develop an understanding of the importance of following the rules of society, whilst learning that different religions have guiding principles.
<u>Individual Liberty</u>	Within school, children are actively encouraged to make choices, knowing that they are in a safe and supportive environment. We educate and provide boundaries for children to make choices safely, through provision of a safe environment and empowering education.
<u>Democracy</u>	During Mathematics, children are encouraged to take the views and opinions of others into account but still have the right to make their own choices. They learn to take turns in both speech and practical sessions. To understand that it is not always possible or right to have their own way, but to learn the value of compromise.
<u>Mutual Respect</u>	Across the school, the children learn to listen and consider the ideas and opinions of others, even if they differ from their own. They are encouraged to take turns during discussions, to resolve difficulties and to make decisions. Mathematics promotes the opportunity to offer supportive comments and feedback that can improve learning outcomes in a way that is thoughtful and kind.
<u>Tolerance</u>	Through Mathematics, the children learn to appreciate the ideas of others that are different from their own and that it is ok to think something different to other people.

Spiritual, Moral, Social & Cultural Education (SMSC)

<u>Spiritual</u>	Throughout all years children develop reflective skills within Mathematics both during lessons and when carrying out self-assessments. Self-assessments are very important to enable children to understand where they are, how they need to improve and ultimately develops an understanding of themselves. Children are always encouraged to challenge their understanding of Maths and how it relates to the world around them. Children are given the choice in many lessons regarding the numbers or methods that they use. They are also able to choose their own problems. It encourages independence and the ability to make decisions based on evidence, reasoning and logic.
<u>Moral</u>	Within Mathematics, children will recognise how logical reasoning can be used to consider the consequences of particular decisions and choices. Children explore a range of mathematical investigations where they are challenged and made aware that there may be more than one solution. On the other hand, they are also aware that some problems require one correct answer. Children are regularly asked to prove or explain whether an answer is right or wrong. This helps the children to learn the value of mathematical truth. Mathematical reasoning is developed through guided group work where the children are encouraged to talk about their learning and listen to other viewpoints. Throughout all key stages, children will look at moral issues raised from a question and will investigate, often using statistics to find an answer.
<u>Social</u>	Problem solving skills and teamwork are fundamental to Mathematics, through creative thinking, discussion, explaining and presenting ideas. Children are provided with opportunities to work together productively on mathematical tasks. Experimental and investigation work provides an ideal opportunity for children to work collaboratively. Socially, peer assessments are important to enable pupils to have an opportunity to discuss and improve their work with others. Working together in pairs or groups and supporting others is a key part of Maths lessons.
<u>Cultural</u>	Mathematics is a universal language with a wealth of cultural inputs throughout the ages. While developing their knowledge of place value, children begin to get a sense of number systems from around the world. Children recognise that mathematicians from many cultures have contributed to the development of modern day Mathematics.

In Foundation Stage: Within EYFS, we aim to provide opportunities to develop children's knowledge and understanding of number, shape, addition, subtraction and number patterns.

In Key Stage 1: Within Key Stage 1, we aim to provide opportunities for children to develop confidence and mental fluency with whole numbers, counting and place value. This will involve working with numerals, words and the four operations, including with practical resources (for example, concrete objects and measuring tools). At this stage, children should begin to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching will 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.

Lower Key Stage 2: Within Lower Key Stage 2, we aim to provide opportunities for children to become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This will allow children to develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, children should begin to develop

their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching will also support children to draw shapes with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. We will support children to 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.

Upper Key Stage 2: Within Upper Key Stage 2, we aim to provide opportunities for children to extend their understanding of the number system and place value to include larger integers. This will allow them to develop connections between multiplication and division with fractions, decimals, percentages and ratio. At this stage, children 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 will consolidate and extend knowledge of 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 four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Impact

By the end of Key Stage 2 we aim for children to be fluent in the fundamentals of Mathematics with a conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. We want children to have the skills to solve problems by applying their knowledge to a variety of situations, including in unfamiliar contexts and real-life scenarios. We also want children to be able to reason mathematically by following a line of enquiry and develop and present a justification or proof using mathematical language.

Assessment of children's learning in Mathematics is an ongoing task through the careful monitoring of children's understanding, knowledge and skills by the class teacher. To monitor progress each class teacher will use daily, weekly or end of unit reviews (within teaching sessions). This assessment guides teachers with their planning and sequencing of lessons to ensure the key skills are taught and full understood before moving onto something new. It also informs which pupils need additional support or challenge.

Summative assessment is conducted three times a year (once each term) to monitor progress and attainment. It informs the class teachers and subject leaders of progress, or skills and knowledge still to be embedded and is tracked on our assessment monitoring system, DC Pro.

Mathematics is also monitored by the subject leaders throughout the year in the form of book monitoring, lesson observations and pupil interviews to discuss their learning and understanding and to establish the impact of the teaching taking place.