Dean Bank Primary and Nursery School

believe, achieve and soar with pride

Maths at Dean Bank Primary School

Intent

At Dean Bank Primary School, our main aim is to strive to have children develop a positive attitude and interest towards mathematics. From the earliest years, we encourage children to 'have a go,' whilst supporting them to notice numbers, patterns, shapes, and connections and to be able to discuss their findings with others. We believe it is important to instill a love of learning from an early age and to teach children that we learn from making mistakes.

Proficiency in mathematical concepts and skills is vital for engaging successfully with the real world. We want to open children's eyes to this and help them to see the importance of how what they learn in the classroom applies to the real world, both every day for everyone and more broadly across disciplines and careers. Beyond teaching maths discretely, we give children the opportunity to apply and develop what they have learnt across wider learning such as in science, geography and design and technology lessons, to support our intention that children see mathematical skills as something that is essential for their daily life.

We believe all children can achieve highly in maths. For some children, this demands a great deal of perseverance and resilience, and we talk explicitly about this in lessons and link it to other areas of curriculum learning, such as PSHCE. We encourage children to support one another to build a classroom climate of endeavour.

Implementation

At our school, we provide a maths curriculum that balances acquiring rapid fluency alongside opportunities to apply reasoning skills in various problem-solving contexts. Each classroom environment is set up to enable children to build independence in learning maths, from up-to-date working walls, carefully chosen scaffolds and accessible resources. The majority of children will be taught the content from their year group only in order that they make genuine progress and avoid gaps in their understanding that provide barriers to learning as they move through education. In mathematics this means ensuring a curriculum that is fully inclusive and aims for of all pupils to:

• become fluent in the fundamentals of mathematics so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately

• be able to solve problems by applying their mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios
• reason mathematically by following a line of enquiry and develop and present a justification, argument or proof using mathematical language
• have an appreciation of number and number operations, which enables mental calculations and written procedures to be performed efficiently, fluently and accurately to be successful in mathematics.

Planning

We use White Rose Maths as a foundation for our Mathematics curriculum. This offers a framework to teach the Mathematics Programme of Study as laid out by the National Curriculum and the Statutory Framework for the Early Years Foundation Stage, alongside other high-quality resources, including NCETM, NRICH and Primary Stars Maths.

The curriculum is carefully sequenced to ensure that mathematical knowledge and skills build systematically. New content and objectives are divided into small manageable steps and opportunities are given for reasoning and problem-solving activities in all lessons. Teachers use professional judgement to make adaptations to meet the needs of the children in their class, including deciding how long to spend on each small step or whether they are needed for their cohort. Teachers will also use the daily fluency sessions and post-learning activities to revisit previous learned knowledge, concepts, and procedures.

Each small step incorporates valuable opportunities for children to develop:

- mathematical talk which provides prompt questions to support children to explain their thinking;
- varied fluency which enables children to meet concepts in a variety of ways;
- reasoning & problem solving which offers opportunities to apply their learning in new contexts.

We use White Rose Maths as a framework for teaching because of its Concrete - Pictorial Abstract approach, which is fundamental to helping children build mental images in their heads, fully understand concepts and spot patterns easily.

Concrete representation: a pupil is first introduced to an idea or skill by acting it out with real objects. This is a 'hands-on' component using real objects and is a foundation for conceptual understanding.

Pictorial representation: a pupil has sufficiently understood the 'hands-on' experiences performed and can now relate them to representations, such as a diagram or picture of the problem.

Abstract representation: a pupil is now capable of representing problems by using mathematical notation, for example, 12 x 2 = 24. It is important that conceptual

understanding, supported by the use of representation, is secure for all procedures. Reinforcement is achieved by going back and forth between these representations.

For this reason, teachers use manipulatives to explain ideas and model techniques, and they are available in every lesson for children to use too. They provide a supportive scaffold for any learner who needs this at any point to achieve success. When children have grasped a concept, they are given opportunities to deepen their understanding through reasoning, problem-solving and investigative challenges. Children who are struggling at any point may receive additional support where necessary in the form or pre- or post-learning activities.

Maths Lessons

Lessons in KS2 generally last 1 hour whilst those in KS1 are approximately 50 minutes. Across the school, maths lessons follow the same structure to ensure consistency in learning.

Maths lessons comprise of the following:

- Daily retrieval practice to provide opportunities for children to secure their understanding of previous subject areas taught.
- Daily feedback questions to consolidate understanding from the previous lesson.
- Explicit teaching - modelling key examples and strategies
- Fluency - practice which will include varied fluency activities
- Applying skills - reasoning and problem solving
- Challenge questions
- Reflection to summarise and build consolidation.

In EYFS, whole class inputs are delivered with follow-on activities which are accessed through provision to practise and consolidate the learning. Daily maths fluency sessions are also delivered following the mastering number programme.

Calculation

As a school, we recognise that a high proportion of pupils enter with mathematical skills that are below and well below average. For this reason, the maths curriculum focuses on developing basic understanding of number, fluency of factual recall and fluency of mathematical procedures during sessions that focus specifically on this. The daily discrete maths lessons include a fluency session at the beginning which focuses on retrieval of previous learning and securing knowledge of the daily arithmetic non-negotiables that are identified for each year group. For children in KS1, these sessions provide the opportunity for them to develop their arithmetic skills in Y1 primarily as a whole class, with a gradual move towards recording responses independently within this year group and in Y2. Additionally, age appropriate times tables practice is built into the

daily morning routine, with children working towards achieving badges for each of the times tables they secure. This is embedded further through explicit teaching strategies for learning times tables; practice using times table songs and games; and the online 'Times Tables Rockstars' programme.

Children in Reception and KS1 also follow the NCETM Mastering Number Programme in addition to their daily maths lesson. This is a whole-class approach with focused, short daily activities which aim to ensure deep, secure understanding of key number knowledge needed in Reception, Year 1 and Year 2 to prevent difficulties later.

Oracy

It is also recognised that children enter our school often having a limited mathematical vocabulary and, because of this, its development is prioritised in the Early Years and across the school. Through mathematical talk, children will develop the ability to articulate, discuss and explain their thinking. Children are encouraged to spot patterns, make connections and use mathematical language to justify their views. We will provide the children with the necessary resources to allow all children to access the curriculum and encourage them to use this where appropriate to explain their thinking and reasoning.

Maths at home

We encourage maths at home through the use of Times Tables Rockstars and Numbots and setting home learning each half term which focuses on a particular set of Key Instant Recall Facts (KIRFs). This helps children to become more secure in their recall of the key facts for their year group.

Assessment

Teachers incorporate daily assessment throughout the lesson through AFL strategies to identify gaps in pupil's mathematical knowledge. Opportunities to address misconceptions or reinforce learning are given as needed throughout and at the end of a topic. Assessments are completed at the end of each unit, alongside end of term summative assessments for each year group (NTS). Teachers will complete their assessment document at the end of each unit to identify any children who have not met the objectives taught. These can be revisited later in the year, or by the next teacher to inform planning. Pupils with significant gaps might have individual targets identified on their SEND Support Plans.

Impact

Pupils talk enthusiastically about their maths and this is evident in the conversations they have with teachers and with each other. The immediate impact of each maths lesson will be apparent within the lesson. The opportunities for discussion, engagement in talk and questioning allow teachers to quickly ascertain the pupils' level of understanding and provide further guidance as necessary. Much of the pupils' work is

marked “live” giving pupils instant feedback on their efforts in order to further their learning. Where necessary and possible, intervention is provided as quickly as possible to help maintain the intention that all pupils become proficient in the mathematical concepts taught.

The progress that pupils make over time is clear evidence of the impact of the teaching and learning. To measure this progress, teachers integrate a combination of formative assessment (gathered during discussions, questioning, resourced activities, paired and independent tasks) and summative assessment carried out at the end of each block and term.

By the end of KS2 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. They should have developed the skills to solve problems, including in unfamiliar contexts and to model real-life situations. Children should be able to reason mathematically by following a line of enquiry and presenting justification and proof using mathematical vocabulary.