

Intent

Mathematics is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. At Braintcroft E-Act Primary academy, we aim to provide a high-quality mathematics education which will provide a foundation for understanding the world, to develop an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. Our pupils will leave our school as confident, resilient mathematicians, demonstrating conceptual and procedural fluency, with the ability to reason mathematically and efficiently solve problems. Our Maths curriculum aims to ensure that all children:

- become fluent in the fundamentals of mathematics, develop a conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. This is achieved through varied and frequent practice with increasingly complex problems
- 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.

Implementation

At Braintcroft E-Act Primary Academy we use a Teaching for Mastery approach to support learning of mathematics through Effective Maths.

Mastery in mathematics is:

- Achievable for all
- Deep and sustainable learning
- The ability to build on something that has already been sufficiently mastered
- The ability to reason about a concept and make connections
- Conceptual and procedural fluency

Teaching for Mastery at Braintcroft E-Act Primary Academy is based on 5 principles:

- 1) Representation and Structure: The representation needs to expose the concept being taught, and in particular the key difficulty point. It exposes the structure. A stem sentence describes the representation or the concept and could be seen as a representation in itself,
- 2) Mathematical Thinking: Taught ideas that are understood deeply are not just 'received' passively but worked on by the learner. They need to be thought about, reasoned with and discussed. Mathematical thinking involves: looking for pattern in order to discern structure, looking for relationships and connecting ideas and reasoning logically, explaining, conjecturing and proving.

- 3) Fluency: Fluency encompasses a mixture of efficiency, accuracy and flexibility (Rusell, 2000).
- 4) Variation: The central idea - to highlight the essential features of a concept or idea through varying the non-essential features. When giving examples of a mathematical concept - add variation to emphasise: What it is (as varied as possible) / What it is not.
- 5) Coherence: Small steps are easier to take. Focussing on one key point each lesson allows for deep and sustainable learning.

Our teaching approach

Our teaching is based upon the Rosenshine's Principles of instructional teaching which is underpinned by three key sources; research in cognitive science, research on the classroom practices of master teachers and research on cognitive supports to help pupils learn complex tasks.

Every lesson is different and specific pedagogical strategies will be applied depending on lesson content. Typical pedagogical approaches in maths include; Lessons typically involve some short input from the teacher, followed by partner talk or task, followed by some additional short input from the teacher, followed by more partner talk or practice activities. We call this a 'Ping Pong' style of teaching and supports a coherent lesson that builds understanding in small steps. (You will not see teachers talking/teaching for 20 minutes in one go and then children working individually for the remainder of the lesson.)

In our math lessons, you can expect to see whole class teaching in mixed attainment classes. We work with the assumption that all pupils are capable of achieving a high standard in mathematics. Pupil work is not differentiated by task. Instead, children who require more support are provided with additional structures to enable them to access the learning (such as working with concrete resources for longer) and children who grasp concepts quickly will be challenged to think about particular aspects more deeply and to work on more challenging problems within the same curriculum content.

Teaching is underpinned by methodical, coherent, curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge. There is a big focus on developing children's mathematical vocabulary and language. Teachers use whole class chorusing, stem sentences and repetition of key words and sentences to ensure pupils develop fluency with using mathematical vocabulary and develop precise explanations.

Teachers make effective use of projectors and whiteboards to model concepts to children using carefully designed teaching slides. Explicit teacher modelling of strategies and procedures through worked examples, with the teacher 'thinking out loud', forms an essential scaffold for pupil learning. Pupils are provided with carefully chosen concrete or iconic representations to support development of conceptual and procedural fluency, with the aim of moving towards working in the abstract.

Pupils have regular opportunity to review previous learning, and new learning builds on previously learnt concepts. This is incorporated within the lessons as well as the activities during the start of the lesson. Key questions are used throughout lessons to support development of mathematical thinking such as, 'How do you know?', 'Can you explain that in a different way?', 'What's the same? What's different?' or 'What do you notice?'. Teachers regularly use precise questioning in class to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all pupils keep up.

Pupils have opportunity for guided practise throughout the teacher directed part of the lesson. Practise is well scaffolded to ensure success and readiness for independent tasks. In each lesson, pupils have the opportunity for independent practise. Practice tasks incorporate conceptual and procedural fluency to ensure intelligent (not mechanical) practice.

Career Professional Development

Middle leaders and teachers are provided with regular opportunities to work collaboratively to develop teaching and learning and deepen subject knowledge. Live coaching is given to teachers to help with their own professional development. CPD is also given by the use of videos by both the lead of maths as well as teachers.

Cross Curricular

Where possible, mathematical skills and ideas are practiced and applied in the real contexts provided by the wider curriculum.

EYFS

The teaching of maths is practical, playful and inclusive with support and challenge from adults in class sessions, small groups and working with individuals. There is a combination of adult-led, teacher taught sessions as well as a wealth of stimulating continuous provision opportunities when adults scaffold learning through skilful interactions and questioning. Throughout all of these areas of learning and at the heart of our EYFS are the “Characteristics of Effective Learning”.

Impact

When the pupils leave Braintcroft E-Act Primary Academy we hope all pupils will be confident, resilient mathematicians, demonstrating conceptual and procedural fluency, with the ability to reason mathematically and efficiently solve problems. They will be prepared to succeed in mathematics at KS3 and KS4. They will be individuals with a love of working with number, who can apply their numeracy knowledge confidently in adult life. We will assess the impact of the maths curriculum in how well it is achieving these aims, and how pupils knowledge and application of maths is building. Regular assessments take place at the end of each unit of work to enable teachers to identify and address gaps and ensure that no pupils are getting left behind.