

# **Foxyards Academy**

## **Teaching for Mastery: Mathematics Policy**

**September 2022**

## Overarching Vision

Our aim at Foxyards Academy is for all children to enjoy mathematics and have a **secure** and **deep** understanding of fundamental mathematical concepts and procedures when they leave us to go to secondary school. We want children to see the mathematics that surrounds them every day and enjoy **developing vital life skills** in this subject.

## Aims for our pupils

- To develop a growth mindset and positive attitude towards mathematics.
- To become confident and proficient with number, including fluency with mental calculation and look for connections between numbers.
- To become problem solvers, who can reason, think logically, work systematically and apply their knowledge of mathematics.
- To develop their use of mathematical language.
- To become independent learners and to work co-operatively with others.
- To appreciate real life contexts to learning in mathematics.

## Introduction

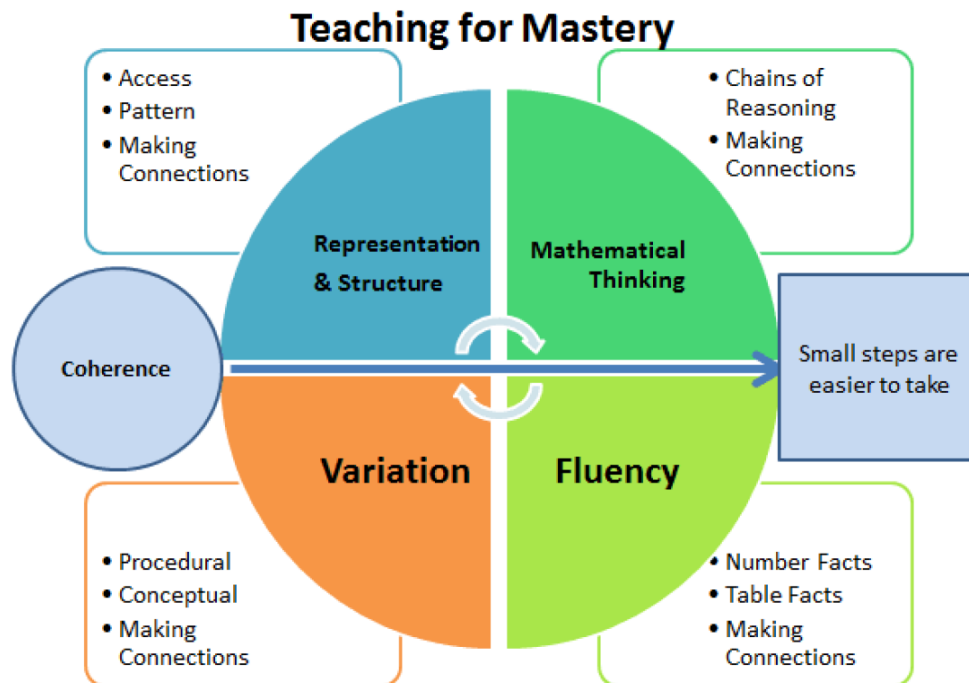
In September 2019, Foxyards Academy began transitioning towards a mastery approach to the teaching and learning of mathematics. We understood that this would be a gradual process and take several years to embed. The rationale behind changing our approach to teaching mathematics lay within the NCETM Maths Hub Programme as well as the 2014 National Curriculum, which states:

- *The expectation is that most pupils will move through the programmes of study at broadly the same pace.*
- *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.*

## **FLUENCY – REASONING – PROBLEM SOLVING**

These three key aims of the National Curriculum should be addressed in each sequence of learning.

## 5 Big Ideas of Mastery



Our teaching for mastery is underpinned by the NCETM's 5 Big Ideas.

- Opportunities for **Mathematical Thinking** allow children to make chains of reasoning connected with the other areas of their mathematics.
- A focus on **Representation and Structure** ensures concepts are explored using concrete, pictorial and abstract representations, the children actively look for patterns and generalise whilst problem solving.
- **Coherence** is achieved through the planning of small, connected steps to link every question and lesson within a topic.
- Teachers use both procedural and conceptual **Variation** within their lessons and there remains an emphasis on **Fluency** with a relentless focus on number and times table facts.

### 8 Classroom Norms to Establish:

1. **Everyone** can learn mathematics to the highest levels.
2. If you 'can't do it', you 'can't do it **yet**'.
3. Mistakes are valuable.
4. Questions are important.
5. Mathematics is about creativity and problem solving.
6. Mathematics is about making connections and communicating what we think.
7. Depth is much more important than speed.
8. Mathematics lessons are about learning, not performing.

*This document has been created using content provided by the NCETM/Maths Hub Mastery Specialist Programme.*

## Teaching for Mastery Principles

- **It is achievable for all** – we have high expectations and encourage a positive ‘can do’ mindset towards mathematics in **all** pupils, creating learning experiences which develop children’s resilience in the face of a challenge and carefully scaffolding learning so everyone can make progress.
- **Deep and sustainable learning** – lessons are designed with careful small steps, questions and tasks in place to ensure the learning is not superficial.
- **The ability to build on something that has already been sufficiently mastered** – pupils’ learning of concepts is seen a continuum across the school.
- **The ability to reason about a concept and make connections** – pupils are encouraged to make connections and spot patterns between different concepts (E.g. the link between ratio, division and fractions) and use precise mathematical language, which frees up working memory and deepens conceptual understanding.
- **Conceptual and procedural fluency** – teachers move mathematics from one context to another (using objects, pictorial representations, equations and word problems). There are high expectations for pupils to learn times tables, key number facts (so they are automatic) and have a true sense of number. Pupils are also encouraged to think whether their method for tackling a given calculation or problem is Appropriate, Reliable and Efficient.
- **Problem solving is central** – this develops pupils’ understanding of why something works so that they truly have an appreciation of what they are doing rather than just learning to repeat routines without grasping what is happening.
- **Challenge through greater depth** - rather than accelerated content, (moving onto next year’s concepts) teachers set tasks to deepen knowledge and improve reasoning skills within the objectives of their year group.

## Curriculum design and planning

- Staff in KS1 and KS2 use **Power Maths as the basis of their planning and White Rose Maths resources for additional support. Power Maths provides** a starting point in order to develop a coherent and comprehensive conceptual pathway through the mathematics through school from Year 1 through to Year 6. The focus is on the **whole class progressing together**. Collaborative planning with year group colleagues is encouraged to ensure consistency however each year group are taught their own, age appropriate curriculum.
- Children in mixed age classes are taught their specific year group curriculum. Teachers in these classes are experienced teachers, often the phase leader, and ‘split teach’ with the support of a teaching assistant.
- Learning is broken down into small, connected steps, building from what pupils already know. Staff use given lesson plans (Power Maths) but annotate these to highlight the intended journey and outcomes as there is no requirement for teachers to produce detailed paper plans. These are kept in classroom planning folders.
- Difficult points and potential misconceptions are identified in advance and strategies to address them planned.
- Key questions are planned, to challenge thinking and develop learning for all pupils.
- Contexts and representations are carefully chosen to develop reasoning skills and to help pupils link concrete ideas to abstract mathematical concepts.

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- The use of high quality materials and tasks to support learning and provide access to the mathematics, is integrated into lessons. These may include additional resources from **Power Maths** or **White Rose Maths Schemes of Learning and Assessment Materials**, **Power Maths** textbook activities, **NCETM Mastery Assessment** materials, **NRICH**, visual images and concrete resources.
- Opportunities for extra fluency practice (*instant recall of key facts, such as number bonds, times tables, division facts, addition and subtraction facts*) should be provided outside mathematics lessons (morning starters or post-lunch).

## Lesson Structure

Lessons are sharply focused; digression is generally avoided.

- Lessons start with a discussion activity (discover or Power Up) where children are required to explore the maths in a given situation and ask questions. This is sometimes maths that will link to the new learning in the lesson.
- Teachers model small-step, new learning (My Turn/I Do).
- Teachers and children work together to deepen understanding, including use of AfL on a similar given problem (our term/we do) – this is completed in maths journal.
- If secure (use of AfL) children have an opportunity to work through a third challenge either individually or together (your turn/I do / our turn/we do) – this is completed in maths journal.
- Teacher and children will cycle this process and teachers will ‘release’ children to further practice the modelled learning in their Power Maths practice books. Release takes place when the teacher is confident a child is ready to practice and develop fluency through intelligent variance questions.
- At the end of a lesson, children will usually complete a review activity (in Power Maths practice books) which is an opportunity to explain an element of their learning (linked to problem solving).
- Teachers assess learning using Manor Teacher Assessment Framework (MTAFs) and record children who have not been successful or require further support or consolidation.

During all maths lessons:

- There is regular interchange between concrete/contextual ideas, pictorial representations and their abstract/symbolic representation.
- Mathematical generalisations are emphasised as they emerge from underlying mathematics, which is thoroughly explored within contexts that make sense to pupils.
- Making comparisons is an important feature of developing deep knowledge. The questions “What’s the same, what’s different?” are often used to draw attention to essential features of concepts.
- Repetition of key ideas (for example, in the form of whole class recitation, repeating to talk partners etc) is used frequently. This helps to verbalise and embed mathematical ideas and provides pupils with a shared language to think about and communicate mathematics.
- Teacher-led discussion is interspersed with short tasks involving pupil to pupil discussion and completion of short activities.
- Formative assessment is carried out throughout the lesson; the teacher regularly checks pupils’ knowledge and understanding and adjusts the lesson accordingly.

- Gaps in pupils' knowledge and understanding are identified early by in-class questioning. They are addressed rapidly through individual or small group intervention, either on the same day or the next day, which may be separate from the main mathematics lesson, to ensure all pupils are ready for the next lesson.
- Teachers discuss their mathematics teaching regularly with colleagues, sharing teaching ideas and classroom experiences in detail and working together to improve their practice.

## Marking

Marking of mathematics books should be completed in line with the Foxyards Academy marking policy. It is essential that all marking picks up and addresses any misconceptions/mistakes and thorough questioning ensures children have clarified their thinking clearly.

Peer and self-assessment and 'over the shoulder' teacher marking is encouraged in lessons to ensure mistakes and misconceptions are identified quickly and at point of error. Where children self-mark, the teacher or TA will spot mark to ensure accuracy of marking and check for errors.

It is expected that most marking is completed within a lesson and children should usually be aware if they have been successful or not with new learning before the end of a lesson.

## Assessment and Record Keeping

In addition to the formative assessment undertaken in lessons, teachers will use end of unit summative assessments supplied by the **Power Maths scheme** to reinforce their judgements and provide further opportunities to identify gaps in pupil learning and tailor future lessons.

Teachers have a MTAF sheet for each unit for their class which is used to record small step learning. Teachers record those that have not been successful and additional support will then be planned and delivered. These are kept in classroom planning folders.

MTAF Teacher judgements are then entered onto **Insight** each term and teachers talk through the progress of their pupils at weekly phase meetings.

Children in year 2, 3, 4 and 5 complete standardized assessment (NFER) in maths each term. Children in 1 completed standardized assessment (NFER) in spring and autumn. Children in year 6 complete 'mock SAT' papers autumn and spring and SAT in summer.

## Teaching in Mixed Attainment groups

All classes in school are mixed attainment. Children sit in mixed attainment groupings in maths lessons and all access the same learning, with scaffolding being provided 'up-front' through modelling and use of appropriate models and images. The vision is for all children to be successful with their maths learning and the intended age expectations.

Mixed age classes may be sat in year groups for maths lessons but will still be mixed attainment.

## Inclusion and Special Needs

Foxyards Academy aims to meet the needs of all, taking into account gender, ethnicity, culture, religion, language, disability, age and social circumstances. The provision for children with special needs is detailed in the SEND Policy. SEN pupils may be supported by additional adults, different resources, differentiated activities. They may also complete additional activities outside of the mathematics lesson as part of planned intervention or pre-teaching. We have high expectations of all children and strongly believe that all children are able to achieve in mathematics. Some may take longer to grasp concepts and may need careful scaffolding or extra time/support.

## Home/School Link

At Foxyards Academy we encourage parents to be involved in the mathematics curriculum by:

- Providing parents with guides outlining what mastery teaching involves in EYFS and KS1 & KS2 and how they can support at home.
- Running teaching for mastery curriculum workshops throughout the year.
- Inviting parents in twice a year for parents evening to discuss their child's progress.
- Reporting on mathematical progress in their child's report.
- Using our mathematics page on the school website to provide information about how we teach the four calculations as pupils move through the school.

Pupils are provided with access to **TT Rock Stars** (timestables) and **Numbots** (calculation/number) apps and encouraged to access these at home. Progress in these are celebrated in class and awards assembly.

## Early Years Foundation Stage (EYFS)

Children in EYFS explore mathematical concepts through active exploration and their everyday learning. Children are formally taught key concepts and develop number sense using a hands-on practical approach. EYFS practitioners provide opportunities for children to manipulate a variety of objects which supports their understanding of quantity and number. Pupils explore the 'story' of numbers to ten and the development of models and images for numbers as a solid foundation for further progress. The CPA approach is used when teaching children key mathematical skills. Practitioners allow children time for exploration and the use of concrete objects helps to support children's mathematical understanding. Mathematics in the early years provides children with a solid foundation that will enable them to develop skills as they progress through their schooling and ensures children are ready for the National Curriculum.

**School Development Area Leader: Mr Chris Burton**

**Linked Governor:**

**Signed: Signed:**

**Date agreed: September 2021**

**Review date: September 2023**