HOWITT PRIMARY COMMUNITY SCHOOL

Embark Multi Academy Trust

Mathematics Policy

March 2022

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Mathematics is a core element of the National Curriculum for all pupils in school and is a language that contributes to the understanding and knowledge of the world through an understanding of number, pattern and sequence. By developing the pupil's ability to identify relationships and their importance through a wide range of mathematical experiences, we aim to contribute to each pupil's personal, social and intellectual development.

Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. (2014 National Curriculum)

Aim

To promote the joy and wonder of maths and to enable pupils to use their knowledge and understanding of mathematics confidently, now and in their future lives.

School aims

- Provide pupils with opportunities for rich and rewarding learning through the highest quality of teaching;
- Foster and develop the necessary skills and attitudes that will enable all pupils to reach their full potential in mathematics;
- Develop pupils' mathematical independence and perseverance;
- Provide a broad and balanced curriculum, ensuring pupils experience all components of the National Curriculum for mathematics;
- Ensure pupils acquire mathematical fluency, develop mathematical language and reasoning skills and the ability to solve a variety of problems.
- Provide equality of opportunity through a mastery approach to mathematics teaching and learning;
- Build on previous experience, knowledge and understanding;
- Allow pupils to develop concepts and acquire knowledge and understanding of all areas of the subject;
- Encourage the development of an enquiring mind, analytical thinking and a logical approach.

Objectives in Teaching Mathematics

To enable pupils to:

- Use information sources and mathematics tools to solve problems and to support learning in a variety of contexts;
- Understand the implications of mathematics for working life and society;
- Develop positive attitudes towards mathematics and confidence in mathematics;
- Have a sense of the size of a number and where it fits into the number system;
- Know by heart number facts such as number bonds, multiplication tables, doubles and halves;

- Use what they know to figure out answers mentally;
- Calculate accurately and efficiently, mentally and with pencil and paper, drawing on a range of calculation strategies;
- Recognise when it is appropriate to use a calculator and be able to do so effectively;
- Make sense of number problems, including non-routine problems, and recognise the operations needed to solve them;
- Explain their methods and reasoning using correct, mathematical language;
- Judge whether their answers are reasonable and have strategies for checking them;
- Suggest suitable units for measuring and make sensible estimates of measurement;
- Explain and make predictions from the numbers in graphs, diagrams, charts and tables;
- Explain properties of 2d / 3d shape, position, direction and movement.

Management and organisation (Foundation Stage)

- Mathematical understanding is developed through stories, games, songs and imaginative play, so that pupils enjoy using and experimenting with number.
- A wide range of activities are provided which focus on mathematical development and draw out mathematical learning, appropriate to the Early Learning Goals of Number and Numerical Patterns, as well as introducing concepts on shape, space and measure.
- The practical activities are underpinned by the pupils' developing communication skills and appropriate mathematical vocabulary.
- Support is given to pupils whose Home Language is not English so as to develop both mathematical language and carrier language.
- Assessment is through observation and is used to inform planning.

Management and organisation (Key Stage 1 and 2)

- Mathematics is taught within the framework of the National Curriculum.
- Mathematics is delivered using the mastery approach, where pupils work on the programmes of study for their year group, and move through the curriculum at broadly the same pace.
- Pupils are grouped within the class using support staff and the class teacher to target underachieving groups/pupils, SEND and disadvantaged pupils. The most able pupils are given challenges and extension opportunities to achieve "greater depth" knowledge and understanding in mathematics.
- Those pupils working below their year group objectives will work on a similar objective to the rest of their peers and work will be differentiated appropriately for their needs and level of understanding.
- In Year 6, pupils are set according to ability.
- When new concepts are taught, lessons will follow the structure of –
  1. Support with practical materials. 2. Support with visual representations. 3. Using and applying in context.
- Practical equipment is located within each classroom and centrally stored in the PPA room. Pupils are encouraged to access support materials and maths equipment independently.
- The school follows the White Rose Maths scheme and teachers have full access to planning materials, teaching slides, worksheets and support materials. Other materials including the Collins and Abacus schemes, Classroom Secrets, Purple Mash and My Maths can be used to support maths teaching and learning.
- Work is recorded and marked in line with the school marking and assessment policies.
- Where appropriate, cross curricular links are made e.g. computing, data work in science, History/Geography, PE.

Planning for mathematics

- Teachers follow the White Rose scheme for mathematics.
- Teachers plan for mental starters and teach the specific skills identified on our mental maths scheme for their year group.
- Teachers use the agreed planning format for mathematics.
- Teachers can use White Rose Maths planning and teaching materials, worksheets and support materials.
- Teachers plan opportunities to develop mental calculation skills, calculation fluency, reasoning and problem solving skills.
- Planning is evaluated to identify next steps.

Organisation and teaching of mathematics through computing.
The school has: an IT suite, tablets, ipads, at least 1 laptop in each class, and each class has an interactive whiteboard. There is also a wide range of software to support the teaching of mathematics. “My Maths” is used to teach maths through IT in school and can be set for homework. TT Rockstars is used to teach times tables fluency with competitions between other schools, including those in the Embark Trust. My Maths, Purple Mash and TT Rockstars are used for maths homework and remote learning.

KS1 Pupils will be taught to apply the following ICT skills in mathematical situations:

- use ICT to explore and solve problems
- further their understanding of retrieved information
- be able to assess the value of using ICT for a task
- consider the use of ICT in the wider world
- communicate ideas and information in a variety of forms
- create, test, modify and store sequences of instructions to control events.

KS2 Pupils will be taught to apply the following ICT skills in mathematical situations:

- organise, reorganise and analyse ideas and information
- select suitable information and media to use in a task
- interpret, analyse and be critical of information held on ICT systems
- use ICT equipment and software to monitor external events
- explore the effects of changing variables in simulations
- recognise patterns and relationships in the results obtained from models and simulations.

Continuity and Progression
We follow the White Rose scheme and yearly overviews for mathematics. Mathematics units or topics are planned and taught in blocks, working towards the End of Year Objectives for each year group. We also have a mental maths scheme of work with year group specific skills.

Teachers will liaise and plan ensuring full coverage of the End of Year Objectives takes place each year. Where appropriate, pupils will be kept together and progress through the objectives as a class using the mastery approach. Activities may be differentiated either by task, support materials, adult support, outcome or extension, whichever is the most appropriate.

Teachers can use the White Rose assessment materials to inform their ongoing teacher assessment. NFER Termly assessments take place to inform their Teacher Assessment levels which are recorded on Itrack.

Pupils complete weekly times tables challenges and their progress is collected and recorded. Pupils receive a certificate for each level passed.

Recording, Assessment, Target setting.
Records of pupils' work are kept in the:

- pupil's mathematics book
- assessments completed on Itrack
- times tables records

The assessment results will be kept by the teacher and termly assessments entered onto Itrack. Assessments are used to inform future planning, both for the class and the individual pupil. Assessment information is passed on to the next class teacher to unsure any gaps in learning are addressed.

Target setting is carried out in the following ways:

- Assessment records allow staff to identify struggling learners and intervention groups.
- Individual Education Plans.
- Whole staff performance management targets.
- Pupil progress review meetings.
- Target groups are agreed and On Track Maths intervention materials are available.

Homework
The pupils are given homework to supplement the learning in the classroom. This may consist of an activity, investigation, a section from the My Maths programme, a Purple Mash activity or TT Rockstars practise time, which can be completed at home.

Equal Opportunities
All pupils have entitlement to the fullest possible experience regardless of race, English language competence, gender or particular learning requirement.

SEND pupils (able and less able) will be supported where mathematics is identified on their IEP. They will follow the same curriculum as their peers.

Resources
Mathematics resources needed for lessons are kept in the classrooms and in the PPA room.

Mathematics Governor
The school governing board has an identified governor responsible for overseeing mathematics as a National Curriculum subject. The appointed governors will support the monitoring of mathematics lessons, discuss planning and data and be made aware of any mathematical activities the school is involved in. Monitoring visits are reported back to the governing board. The nominated governors are Brian McBean and Carolyn Wood (data).

The mathematics subject team is Kellie Knowles and Keely Prince.

- Less time is spent on the planning document, but more time is spent on **structuring** the lessons with slides to develop the **small steps**.

- Whole class teacher led lessons where all pupils are learning the **same mathematical concept or skill**.

- To improve pupils' understanding of maths, to develop and improve their **"maths talk"** and written communication, and for peer support, don't always seat pupils in ability groups – in particular don't always 'isolate' the higher attainers.

- The lowest ability pupils are supported throughout the lesson.

- Mathematical vocabulary sheets are stuck in the front of pupils' maths books and are year group specific.

- Pupils need to be familiar with the sentence starters and need to use them in every lesson – these will **promote the language of maths** and improve verbal and written mathematical communication.

- Use their maths books like **journals**. If they have been doing some intelligent practice and notice a pattern, get them to communicate what they have noticed in their books before the next calculation. Aim to form a conclusion each lesson / topic. (Links with the generalising…sometimes always never….. what rule can we form from this work?)

- Each new concept should follow the sequence of the use of **concrete manipulatives, then pictorial representations, leading to abstract calculations.** Pupils should be encouraged to repeat this sequence independently when encountering problems.

- More maths equipment readily available and pupils encouraged to draw **pictorial representations** to clarify their understanding of a problem.

- Every lesson begins with a mental starter. At least one starter each week should be from the mental calculation scheme and specific to your year group. Try and choose mental skills that are beneficial to your main objective.

- Other mental starters could be White Rose Flashbacks, teaching times tables, calculation practise, Howitt times tables challenge or reviewing misconceptions.

- The lesson then develops in **small steps**, with the teacher modelling a maths skill needed, the pupils will do some **intelligent practice** and **variation** to achieve fluency. Fluent mathematicians should use the sentence starters to explore independently, not just do more.

- Answers can be marked after each short section by the pupils, allowing for mistakes to be explored and corrected by the pupils and the teacher, and interventions completed by the TLA before the pupil moves on.

- After each small step, **the learning is clarified verbally** by the pupils, refined by the teacher and written communication is recorded with the use of the maths sentence starters and maths journal written work.

- Once fluent, the lesson will develop into application – first led and modelled by the teacher, then peer supported before the pupils work independently. The lowest ability may need more fluency work here; achieving fluency will still narrow the gaps and ensure they are working towards or at their expected standard.

- **Don't allow 1 word answers. Pupils should be explaining their answers and mathematical understanding in full sentences.** The teacher should refine and model for the pupils to repeat if necessary.

- Ensure tasks set allow the pupils to go deeper; you don't have to create more work. Get pupils to look for patterns and explain them, make predictions, invent their own, use their sentence starters and maths journal work for evidence. Make use of Nrich investigations and Mastery at Greater Depth questions.

- All pupils should be exposed to "Greater Depth" experiences, allowing for more pupils to achieve "Greater Depth" in maths. Remember – **White Rose only exposes pupils to the 'expected' standard**.

- Lessons end with clarification of learning, drawing **conclusions** and **explaining their understanding**.