Maths Policy

Audience:	Parents School staff Local Governing Bodies
Approved:	Jan 2022
Other related policies:	Calculation Policy, EYFS Policy, Teaching and Learning, SEND, Equalities
Policy owner:	Vicky Higgins
Policy model:	SMFA
Review:	
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At Sir Martin Frobisher Academy, we aim to inspire all children to reach their full academic potential. In Mathematics, this means ensuring a curriculum that is fully inclusive of all children, which allows learners to: hone skills and methods; think critically; and provides opportunities for them to communicate their understanding. Children are provided with chances to use their mathematical skills in a variety of contexts across the curriculum.

Mathematics is a powerful, universal language used to explain, predict and represent events as well as to tackle everyday problems; Mathematics is of central importance to our modern society. It is an essential part of everyone's daily lives and critical to science, technology, finance and engineering. Mathematics is necessary for any employment and independent life beyond education.

Intent

At Sir Martin Frobisher Academy, we teach a mastery approach to Maths which is aligned with the goals of the National Curriculum and follows a Concrete, Pictorial, Abstract sequence to support and deepen children's understanding of the main areas of maths, whilst exposing them to fluency, reasoning and problem solving. Our aim is to ensure that our children become fluent and confident with all aspects of Maths.

With this in mind, the aims of this Mathematics Policy are:

- To provide opportunities for children to explore concrete and pictorial representations before moving onto abstract concepts.
- To provide a rich environment that promotes learning mistakes.
- To equip children to solve problems by applying prior knowledge.
- To promote enthusiasm and enjoyment for learning through exciting teaching and learning opportunities.
- To develop logical thinking, reasoning and problem-solving skills through natural curiosity and investigative approaches.
- To develop a thorough knowledge and understanding of numbers and the number system.
- To encourage a range of strategies to solve problems including bar-models.
- To understand the importance of mathematical skills in everyday life.
- To maintain high expectations for all learners within mathematics.

Power Maths at Sir Martin Frobisher Academy:

At Sir Martin Frobisher Academy, we use Power Maths as a resource to support the progression of teaching and ensure children are exposed to real-life problems. Teachers are encouraged to use the resources from Power Maths to suit the needs of their class, making appropriate provision adjustments as necessary.

Power Maths is a whole-class mastery programme designed to spark curiosity and excitement and help you nurture confidence in maths. The Power Maths model also includes procedural and conceptual variation which allows children to further embed their understanding in various contexts and representations through having to reason and problem solve. We build on small steps across a unit to ensure a secure foundation of knowledge and skills before moving on to the next "step" of learning. We encourage discussion both as a whole class or in small groups to address

misconceptions and promote the value of confidence, embedding reasoning skills at every point of opportunity.

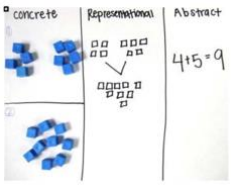
A Mastery Approach

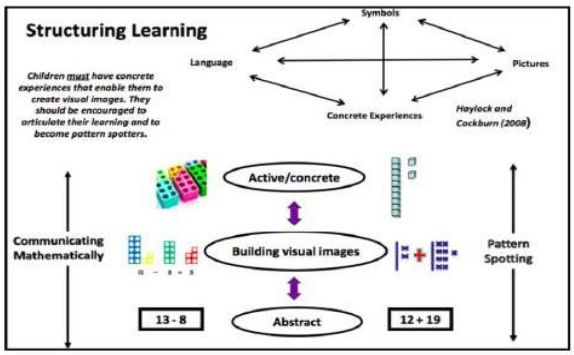
A mastery approach to the teaching of Mathematics has been adopted, to enable high expectations of all our pupils. The mastery approach to Maths allows children to have a concrete understanding, using physical resources to "play" with Maths and embed understanding. It meets the needs of the pupils by developing resilience and promoting questioning.

Staff at Sir Martin Frobisher Academy endeavor to make the Mathematics curriculum accessible to all pupils, moving them through the programme of study at broadly the same pace. All children need a deep understanding of the Mathematics that they are learning; this will ensure that future learning is built upon firm foundations. Within this approach children develop their fluency in Mathematics without rote learning. Research suggests that pupils develop a deep, long term and adaptable understanding of Mathematics through mastery approaches.

Concrete – Pictoral – Abstract

At Sir Martin Frobisher Academy, we use a CPA approaches within all key stages; this is recognised as a highly effective approach that supports the understanding of Mathematical concepts. The approach is based upon research by psychologist Jerome Bruner (1960) and suggests that these three stages are necessary for pupils to develop understanding of a concept.





Using concrete resources allows opportunities for informal play/exploration to occur; this is supported by Zoltan Dienes' (1969) theory. This takes place at the beginning of all learning as it gives pupils the opportunity to investigate a concept first and then make connections when formal methods are introduceds~~introduces~~ through teaching. Within pictorial stage the pupil will need to draw representations (e.g. dienes, numicon or place value counters); this is to reinforce the concept being taught. The abstract stage often runs alongside the concrete and pictorial stage as children will need to read M~~m~~athematical statements and use the concrete resources or pictorial representations to show their understanding. At Sir Martin Frobisher Academy, teachers use this approach based upon their understanding and love of M~~m~~aths with the right kind of teaching and support.

Growth Mindset

The Mastery Approach in Mathematics also includes adopting a '**growth mindset'** which is essential for learners to be successful. Children at Sir Martin Frobisher Academy are encouraged to believe they are all capable of learning and succeeding in Mathematics, given sufficient time, good teaching, appropriate resources and effort.

Growth Mindset features:

- Everyone can learn Mathematics to the highest levels.
- Mistakes are valuable.
- Questions are important.
- Mathematics is about creativity, pattern spotting and sense making.
- Communication and making connections are vital components of Mathematics.
- In Mathematics lessons, the focus is more on depth of understanding than speed.

Planning

Weekly lesson plans are annotated and saved in a planning file on the school system, along with required resources. The daily lesson plans include the teacher and teaching assistant's focus within each part of a lesson to ensure effective differentiation for learners. Teachers, in each year group, have been provided with resources to support planning Mathematics at greater depths, including textbooks, workbooks, online resources, practical resources, games and software.

Mathematics in Foundation Stage is a practical, activity-based subject both indoors and outdoors. In Foundation Stage, Mathematics is planned by teachers using the Power Maths scheme alongside the White Rose scheme, with a range of continual provision opportunities provided for children to access independently outside of discrete adult-led sessions.

Implementation

Mathematics Lessons

Our approach is built around a child centred lesson that models and embeds a growth mindset approach to Maths~~maths~~ and focuses on helping all children to build a deep understanding of Maths~~maths~~ concepts. Lessons are taught using a structured approach to a lesson, designed to give opportunities for children to "Discover" a new concept set within a real-life context, "Think Together" and explore this concept further. They then come together and "Share" ideas where teachers address misconceptions, question the children and attempt to deepen the thinking within the classroom. Teachers use precise questioning in class to test conceptual and procedural knowledge and to assess which children need further support to consolidate understanding. Children then work on "Practice" questions which further challenge to consolidate and deepen understanding, focusing on fluency, reasoning and problem solving through variation.

As children progress through the school, they continue to revisit key areas of Maths: Number and Place Value, Addition & Subtraction, Multiplication & Division, Fractions Geometry- Properties of Shape & Position & Direction, Measurement- Time, Weight, Height, Volume, Capacity, Statistics, Algebra & Ratio & Proportion (refer to Maths overview for more detail).

Differentiation within the Maths lesson is typically through depth rather than acceleration. When children grasp concepts quickly, they are challenged with rich and sophisticated problems within the small step they are focusing on for a lesson. Children who are not sufficiently fluent are provided additional support to consolidate their understanding before moving on.

Mathematics Working Wall

It is expected that all classrooms will have a Mathematics Working Wall. This is an interactive display board to show the process of Mathematics and the learning journey within the current unit of work. This board is regularly changed to reflect the teaching and learning activities happening in the classroom. This display should include materials to support children (e.g. models and success criteria) when accessing their independent tasks. Mathematics working walls are clearly visible and provide the children with key vocabulary, resources and challenges that are appropriate for the unit of work.

Mathematics Assessment

Children's Mathematics books and assessments provide evidence of progress and attainment. Learning is recorded in as many ways as possible to provide the children with a range of experiences e.g. photographs, pupil reflections, observations & end of unit reviews. Teacher assessments are based upon the practical, written and oral work completed by the children.

There are a number of different styles of assessment in our Mathematics curriculum:

- Formative – on a daily and weekly basis, teachers monitor progress and learning to ensure the children are understanding their new learning before moving on. This informs future planning, providing challenge and support where necessary. Assessments are shared with children and updated regularly by teachers.
- Termly assessments – teachers use their knowledge of each child and evidence gained to make individual judgments for each child's Mathematical ability. As part of this, children complete an NTS test based upon targets for the year group they are working within.
- KS1 SATS – at the end of year 2, teachers are required to submit assessment levels in Mathematics to the local authority on each child.
- KS2 SATS – at the end of year 6, children complete 3 Mathematical test papers (1 arithmetic paper and 2 further papers based upon the child's ability to reason), that assess the children's understanding of the Key Stage 2 curriculum. The class teachers also submit their judgment of the children's attainment termly with the support of summative assessments.

Cross-curricular Learning

Although Mathematics is taught as a discrete subject, staff are encouraged to exploit any cross-curricular links and provide opportunities for children to demonstrate their knowledge of concepts or skills in other subjects such as:

English: Mathematics contributes significantly to the teaching of English with children being encouraged to read and interpret mathematical problems. Speaking and listening is also a key feature as children are encouraged to work in groups and share their ideas. Writing within Mathematics is strongly encouraged at Sir Martin Frobisher Academy with reflections and evaluations becoming a key part of a child's Mathematical learning journey.

Computing: Children use and apply Mathematical skills in a variety of ways when using ICT. Younger children use ICT to learn about positional vocabulary by directing and controlling the

Beebots. They also present information using M~~m~~athematical symbols. Older children present information related to data handling through computer programs such as Excel. When Key Stage 2 children work with programming software (e.g. Scratch), they use units of measure for distance and angles.

Curriculum for Life: Through paired and group work in Mathematics, children are encouraged to value others, their contributions, thoughts and take responsibility for their own learning.

Homework/ Parental Involvement

Appropriate homework activities are set for each year group. All children also have a login for Doodle Maths and Timestables where they are able to practise their mathematical knowledge and T~~t~~imestables frequently. Both Doodle Maths and Timestables provide a personalised learning path for the children to develop their fluency and understanding in Maths.

Sir Martin Frobisher Academy encourages parents to be actively involved in supporting their children's mathematical ability. This can be through daily counting, learning number bonds, recalling multiplication and division facts as well as talking through their mathematical understanding. There have been developments in the strategies taught in schools; therefore, parents are able to access the Mathematics Calculation Policy.

Special Educational Needs/Gifted and Talented

We aim to provide a rich mathematical education, which will develop the potential of all pupils regardless of race or gender. Children who regularly grasp concepts rapidly are provided with extension activities to deepen their understanding for their year groups learning objectives. Planning for these pupils will focus on enrichment prior to acceleration as well as the development of mathematical thinking rather than covering content more quickly. Teachers are equipped to provide challenging and stimulating problems along with probing questions.

Appropriate adjustments are made for children with special educational needs if required (as guided by SENCO). Any child who is assessed to have special education needs in Mathematics will have a Mathematics target on an individual basis. Outside of the lessons, some children are provided with additional support through one to one work or small group work with a teacher, learning support assistant or higher-level teaching assistant.

Leadership and Management of Mathematics

The Maths Lead works in conjunction with the S.L.T. The role of the subject leader involves:

- modelling good practice;
- being responsible for the upgrading and ordering of resources and arranging for their storage;
- keeping informed about developments and new initiatives to support the teaching of Maths and ensure staff are informed;
- auditing needs and organisinge~~organise~~ staff training;
- training staff in teaching and learning of Maths;

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- monitoring progress on a regular basis and feeding back to the head teacher;
- supporting teachers in planning and using resources;
- updating the school policy when necessary.
- ensuring Year 6 children are fully prepared for their national end of year assessments.
- liaising closely with the assessment leader.

Governing body

Each term, the governing body is informed of the achievements and progress in Mathematics throughout the school. The Mathematics Subject leader is responsible for keeping the governing body up to date with new initiatives and developments.