

Mathematics Policy

JANUARY 2019

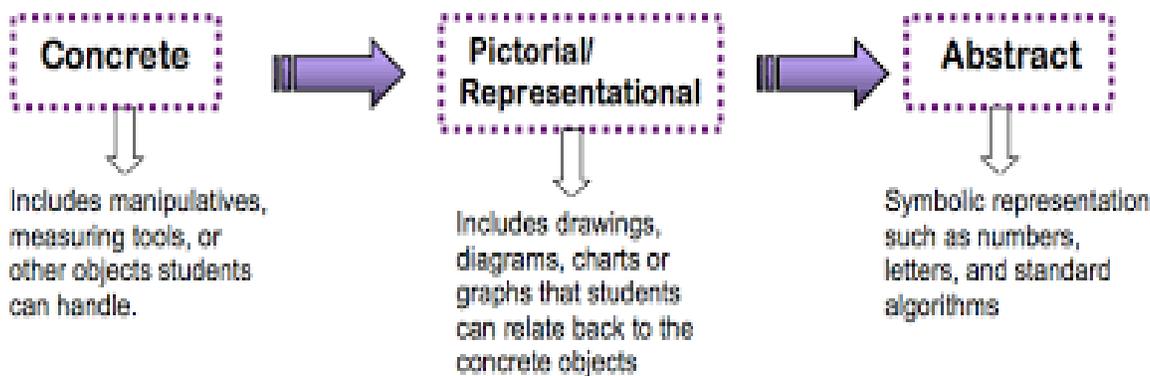


1 Aims and Objectives

1.1 Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

1.2 Our objectives in the teaching of mathematics are to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- 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.
- to achieve these aims we employ concrete and pictorial representations alongside the abstract to develop and reinforce understanding for all children, regardless of ability and attainment.



1.3 We aim for our children to achieve mastery in mathematics. Mastery of mathematics means a deep, long-term, secure and adaptable understanding of the subject. Secure progress in learning mathematics is based on developing procedural fluency and a deep understanding of concepts in parallel, enabling connections to be made between mathematical ideas.

An approach based on mastery principles:

- makes use of mathematical representations that expose the underlying structure of the mathematics;
- helps children to make sense of concepts and achieve fluency through carefully structured questions, exercises and problems that use conceptual and procedural variation to provide 'intelligent practice', which develops conceptual understanding and procedural fluency in parallel;
- blends whole class discussion and precise questioning with intelligent practice and, where necessary, individual support.

Mastery of mathematics, which should build gradually as a child goes through school, is a tool for life.

2 Teaching and Learning Style

- 2.1 The school uses a variety of teaching and learning styles in mathematics. Our principal aim is to develop children's knowledge, skills and understanding. During our daily lessons, we encourage children to discuss their maths using appropriate vocabulary as well as in answering mathematical questions. They have the opportunity to use a wide range of models images and practical resources to support their work. IT is used in mathematics lessons for modelling ideas and methods. Wherever possible, we encourage the children to apply their learning to everyday situations.
- 2.2 In all classes, we recognise that children have a wide range of mathematical abilities. At the centre of the mastery approach to the teaching of mathematics is the belief that all pupils have the potential to succeed. They should have access to the same curriculum content and, rather than being extended with new learning, they should deepen their conceptual understanding by tackling challenging and varied problems. Similarly with calculation strategies, pupils must not simply rote learn procedures but demonstrate their understanding of these procedures through the use of concrete materials and pictorial representations. Children can be organised to work in pairs or groups on open-ended problems or games. We use classroom assistants to support some children, and to ensure that work is matched to the needs of individuals.

3 Mathematics Curriculum Planning

- 3.1 Mathematics is a core subject in the National Curriculum, and we use this as the basis of the programme of study for mathematics.
- 3.2 We carry out the curriculum planning in mathematics in three phases (long-term, medium-term and short-term). The National Curriculum gives a detailed outline of what we teach in the long term, while our yearly teaching programme identifies the key objectives we teach to in each year. We use the Programme of Study from the White Rose Maths Hub (2017). Teachers use this resource to plan teaching sequences to suit the needs of the children in their class. Although number is at the heart of the Mastery curriculum, mathematics at Gravenhurst also includes Measurement (length, height, weight, volume, time, money, temperature), Geometry (shape, position and direction) and Statistics.

- 3.3 It is the class teacher who completes the weekly plans for the teaching of mathematics. These weekly plans list the specific learning objectives and expected outcomes for each lesson, and give details of how the lessons are to be taught. The class teacher place the weekly plans on the server and they are monitored by the subject leader.
- 3.4 We plan the activities in mathematics so that they build on the children's prior learning. While we give children of all abilities the opportunity to develop their skills, knowledge and understanding, we also plan progression, as outlined in our Calculation Policy, into the scheme of work, so that there is an increasing challenge for the children as they move up through the school.
- 3.5 In the Foundation Stage, during child initiated play, the children are able to be creative with numbers, group objects, compare sizes, name shapes, use the language of measure and mass, order and copy patterns, discriminate, count using apparatus and everyday objects, learn number rhymes and songs. Discussion on the carpet will develop their mathematical understanding.

Maths planning in Foundation Stage introduces mathematical vocabulary and concepts through practical activities. It can be used as a check for mathematical understanding and with its variety of activities a facility for extending the children's depth of knowledge.

4 Contribution of mathematics to teaching in other subjects

4.1 **English**

The teaching of mathematics contributes significantly to children's understanding of English in our school by actively promoting the skills of reading, writing, speaking and listening. For example, in mathematics lessons, we expect children to read and interpret problems, in order to identify the mathematics involved. They are also improving their command of English when they explain and present their work to others during plenary sessions. In English lessons, too, maths can contribute: younger children enjoy stories and rhyme that rely on counting and sequencing, while older children encounter mathematical vocabulary, graphs and charts when reading non-fiction texts.

4.2 **Personal, social and health education (PSHE)**

Mathematics contributes to the teaching of PSHE. The work that children do outside their normal lessons encourages independent study and helps them to become increasingly responsible for their own learning. The planned activities that children do within the classroom encourage them to work together and respect each other's views.

4.3 **Spiritual, moral, social and cultural development**

The teaching of mathematics supports the social and emotional development of our children through the way we expect them to work with each other in lessons. We group children so that they work together, and we give them the chance to discuss their ideas and results.

5 Mathematics and IT

5.1 Information and communication technology enhances the teaching of mathematics significantly, because IT is particularly useful for mathematical tasks. It also offers ways of impacting on learning which are not possible with conventional methods. Teachers can use software to present information visually, dynamically and interactively, so that children understand concepts more quickly. Younger children use IT to communicate results with appropriate mathematical symbols. Older children use it to produce graphs and tables when explaining their results, or when creating repeating patterns, such as tessellations. When working on control, children can use both standard and non-standard measures for distance and angle. They can also use simulations to identify patterns and relationships. Email permits collaborative problem-solving.

6 Mathematics and Inclusion

- 6.1 At our school, we teach mathematics to all children, whatever their ability and individual needs. Mathematics forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our mathematics teaching, we provide learning opportunities that enable all pupils to make good progress. We strive hard to meet the needs of those pupils with special educational needs, those with disabilities, those with special gifts and talents and those learning English as an additional language, and we take all reasonable steps to achieve this.
- 6.2 When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, and differentiation – so that we can take some additional or different action to enable the child to learn more effectively. Assessment against the National Curriculum allows us to consider each child's attainment and progress against age-related expectations. This ensures that our teaching is matched to the child's needs.
- 6.3 Intervention through Stage 1 and Stage 2 will lead to the creation of an Individual Education Plan (IEP) for children with special educational needs. The IEP may include, as appropriate, specific targets relating to mathematics.
- 6.4 We enable all pupils to have access to the full range of activities involved in learning mathematics. Where children are to participate in activities outside the classroom (a 'maths trail', for example), we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

7 Assessment

Please refer to the school's Assessment, Marking And Presentation Policy.

8 Resources

- 8.1 All classrooms have a number line and a wide range of appropriate small apparatus. KS2 have access to calculators and all classes have access to google chromebooks. Each classroom has access to books and other printed materials to support children's individual research. A range of software is available to support work with the interactive whiteboard.

9 Monitoring

The coordination and planning of the mathematics curriculum are the responsibility of the Mathematics Subject Lead, who also:

- supports colleagues in their teaching, by keeping informed about current developments in mathematics, and by providing a strategic lead and direction for this subject;
- give the associate principal an annual summary report in which they evaluate the strengths and weaknesses in mathematics, and indicates areas for further improvement;
- use specially allocated regular leadership time to review evidence of the children's work, and to observe mathematics lessons across the school.

Implementation and Review

This policy will be made known to all staff, parents/carers and governors, and published on the academy's website. Copies are also available upon request from the academy office. This policy will be reviewed every year.

Written by:	S Calbraith	Date: 18/12/2018
Agreed by Principal:		Date:
Ratified by Governors:		Date:
Staff read and agreed [Provide a space for all staff to initial]:		Date: