Mathematics Policy

Gascoigne Primary School

article 28 (right to education)
Every child has the right to an education. Primary education must be free and different forms of secondary education must be available to every child. Discipline in schools must respect children's dignity and their rights. Richer countries must help poorer countries achieve this.

article 29 (goals of education)
Education must develop every child's personality, talents and abilities to the full. It must encourage the child's respect for human rights, as well as respect for their parents, their own and other cultures, and the environment.

article 31 (leisure, play and culture)
Every child has the right to relax, play and take part in a wide range of cultural and artistic activities.

Approved by:	Governing Body	**Date:**	30.01.2024
Last reviewed on:	December 2023		
Next review due by:	December 2025		

Contents

1. Purpose of the policy

This policy reflects the aims and values of Gascoigne Primary School. It ensures all stakeholders, including staff, governors, parents and pupils, are working towards the same goals.

The purpose of this policy is to:

Set out a framework for all teaching and non-teaching staff, giving guidance on planning, teaching and assessment

- Demonstrate adherence to the National Curriculum objectives and guidelines
- Provide clear information to parents and carers about what their children will be taught
- Allow the governing board to monitor the curriculum
- Provide Ofsted inspectors with evidence of curriculum planning and implementation

This policy will be available on our school website https://www.gascoigneprimaryschool.co.uk/schoolpolicies

2. Subject vison

Mathematics is a creative and highly inter-connected 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.

Purpose of Study, National Curriculum 2014

In order to achieve this at Gascoigne, we are working hard to deliver a curriculum that enables all pupils to acquire the basic skills as well as developing their appreciation of the different mathematical forms and structures through a wider creative curriculum, which links learning to real life situations.

3. Aims and outcomes

The national curriculum for mathematics aims to ensure that all pupils:

➢ become fluent in the fundamentals of mathematics, including thorough, 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 nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Aims, national Curriculum 2014

4. Teaching and learning

Early Years Foundation Stage (EYFS)

In Nursery and Reception, mathematics is taught through the Early Years Foundation Stage Framework. This involves providing children with opportunities to improve their counting skills, understand and use numbers, solve simple addition and subtraction problems, and describe shapes, spaces, and measures. Children learn through planned play and a combination of adult-led and child-initiated activities. The Reception teachers use the NCETM Mastering Number programme as a guide for focused mathematics sessions and guided group work.

Mathematical activities are also incorporated into continuous provision/outdoor play and enhancements. The curriculum maps ensure that all key mathematical concepts are taught and built upon throughout the year. Children are taught in mixed ability groups, with the majority working towards the early learning goals at the same pace. Those who grasp concepts quickly are challenged with more complex problems, while those who need more support are given additional opportunities to develop their understanding before moving on.

Key Stage 1 and Lower Key Stage 2

As of September 2020, Teachers in KS1 and lower KS2 have been supported in their teaching of mathematics by the Teacher's Guides, Textbooks and Workbooks published by 'Maths - No Problem!' With a focus on teaching maths for mastery, the series is designed to improve the maths confidence of both teachers and learners. It complies with the UK's HighQuality Textbook guidance published by the NCETM and was selected by the DfE for use in the Maths Hub programme.

The Singapore approach to mathematics teaches pupils to understand maths in stages, beginning with concrete (using counters, Base 10, number disks and so on), then moving to pictorial (solving problems where pictures are involved), and finally working in the abstract (where numbers represent symbolic values). Through this process, children learn numerous strategies to work with numbers and build understanding.

The whole class will work through the programme of study at the same pace with ample time and practice in each topic before moving on. The concept of teaching to mastery is to ensure that topics are well developed. An idea is well formed then reinforced by practice. New knowledge is then used in subsequent lessons so that all ideas build on top of each other and pupils have plenty of opportunities to develop relationships between topics. Ideas are revisited in a spiral as pupils progress through the years, each time at a higher level.

Upper Key Stage 2

In Year 5 and Year 6 Teachers follow the programmes of study set out in the Mathematics curriculum 2014 and use the Maths No Problem! Scheme of work to guide them in their weekly planning. The weekly plan details teaching activities, independent and guided tasks, key questions and assessment opportunities, as well as where and how any adult support will be used within the lesson. The mastery approach is used with children working through the curriculum objectives at broadly the same pace. Additional teaching staff will work in these year groups to provide extra support for those children not working at the ageexpected level.

The topics we teach in mathematics are outlined in the programmes of study/curriculum map for maths (see section 5.2).

5. Curriculum overview

5.1 Mathematics Curriculum Planning

The School uses the Maths No Problem series for long- and medium-term planning and this informs teachers' weekly short-term planning. Short term planning is based on each year group's Maths No Problem textbook which details the expectations set within the National Curriculum. As the outline of the lesson and activities are already prepared, teachers are able to use planning time to think about the pedagogy of the lesson.

Within a year group, teachers produce presentations using Slides that are easily accessible to all; these should include questioning and visual aids appropriate for the session to outline the learning. These are monitored by Subject Leaders, who offer support where needed.

The lessons at Gascoigne are divided into the following distinct parts:

Explore Task: Children are presented with a problem which they need to solve in mixed ability groups. During this part of the lesson, the Teacher will provide the children with a range of suitable manipulatives (resources such as cubes, counters or number cards); teachers also ask well thought-out questions, which enable the children to think deeply about their learning.

Master: During this part of the lesson, the children have the opportunity to share their methods, which are then shared with the class. The teacher will use the textbook at this point to share multiple methods to solve the problem.

Guided Practice: The teacher works with the class through a series of related questions designed to help the children develop their ability to identify patterns and use these to make links in their learning.

Independent Practice: Once the teacher is satisfied that the children have all accessed the learning, they have the opportunity to complete a workbook activity where they can demonstrate their learning.

Arithmetic

As a school, we are keen to develop children's mental arithmetic skills. Mental maths skills are incorporated into daily lessons; this helps a pupil's ability to calculate mentally, develop knowledge of number and multiplication facts. We have introduced a focus on retrieval of facts previously learnt as well as fast and automatic recall of number facts.

Mastering Number

In key stage 1, the Mastering Number programme has been introduced as a systematic and structured approach to teaching early addition and subtraction skills. The programme includes stages such as adding 1, adding 0, making and breaking numbers to 10, addition and subtraction of numbers below 20 and then applying this to larger 2-digit numbers. Sessions follow a structure of some explicit teaching using an animation and also carefully designed practice questions for the children.

Fluent in Five & Flashback Four

In key stage 2, daily arithmetic practice or 'fluent in 5' is built into Maths lessons, the content of which has been carefully mapped to reflect the learning from the previous year that should then become automatic. We will also be using a style called "Flashback four" where the lesson starts with four retrieval questions (from last lesson, last week, last half term and last year). The intention is that this will increase retrieval and will minimise gaps in learning and the need to re-teach contents.

Times Table Rockstars / Numbots

By the end of year 4, children should be proficient in all of their times-tables up to 12x12.

In the summer term, the children in year 4 sit the Multiplication Tables Check (MTC) to test their knowledge of times-table. To support the learning and continued practice of timestables, we use Times Table Rockstars (TTRS). This is an online platform where children engage in a range of games to improve their speed and accuracy with times-tables.

Prior to learning their times-tables, children need to become proficient in their basic addition and subtraction skills. To support this, we use Numbots. This is linked to TTRS. Children in keys stage 1 use to become faster and more efficient at their basic number bonds. All children are encouraged to practice on the relevant game daily at home and weekly at school.

Spoken Language

The National Curriculum for mathematics reflects the importance of spoken language in pupils' development across the whole curriculum-cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting mathematical justification, argument or proof. Pupils MUST be assisted in making their thinking clear to themselves as well as others and teachers MUST ensure that their pupils build secure foundations by using discussion to probe and remedy their misconceptions. (see

NCETM Mathematics Glossary)

Extension Activities

Extension activities should be made readily available each lesson. These are primarily for pupils who have completed their work quickly and to the required standard. Pupils are then free to select work without interrupting group teaching. This also aids independence. Work does not always have to match the current daily objective and can be an extension of previous concepts taught. Our pupils particularly benefit from additional word problem solving activities in order to develop their mathematical vocabulary and using/ applying skills. The 'Quick 6' challenge cards and 'Maths Sentence Stems' need to be used to promote mathematical discussions enabling pupils to demonstrate a deeper understanding of concepts. See Appendix 4.

5.2 Programmes of study

The included subject examples are taken from the National Curriculum for mathematics:

	Autumn term	Spring term	Summer term

EYFS	Number sense Subtising and counting within 5 Explore composition of numbers within 5.	Shape Space & Measure Explore composition within and beyond 5. Doubling and halving Odd & even Numbers	Patterns Count to 20 Compare numbers Consolidate counting to 20 Number facts to 10

Year 1	Numbers to 10 & 20 Number Bonds Addition & Subtraction within 10 & 20 Position	Shape and Patterns Length and Height Numbers to 40 Addition and Subtraction Word Problems Multiplication and Division	Fractions Numbers to 100 Time Money Volume & Capacity Mass Space
Year 2	Numbers to 100 Addition and Subtraction Multiplication of 2, 5 and 10 Length & Mass Temperature Pictograms	Word Problems Money 2D Shapes 3D Shapes Fractions Time Volume	Revision Mastering Number & Ready to Progress Materials
Year 3	Numbers to 1000 Addition and Subtraction Multiplication and Division Length	Mass Volume Money Time Pictograms & Bar Graphs Fractions	Fractions continued Angles Lines and Shapes Perimeter
Year 4	Numbers to 10,000 Add/Subtraction within 10,000 Multiplication and Division including (further multiplication & division)	Graphs Fractions Decimals Money Length	Mass Volume Area & perimeter Geometry Position & Movement Roman Numerals
Year 5	Numbers to 100,000 Addition and Subtraction Multiplication and Division Graphs	Fractions Decimals & Percentages Geometry Position and Movement Measurements	Roman Numerals Area and Perimeter Volume Revision

Year 6	Numbers to 10 million Four operations on whole numbers Fractions Decimals & Percentages Measurements Ratio Algebra	Area and Perimeter Volume Geometry Position and Movement Graphs and Averages Negative Numbers	Revision Transition work for Year 7

6. Cross-curricular links

Mathematics shares links with the following subjects:

- Science: Collection and recording of data, data handling, measure
- ART: symmetry, pattern, shape
- Computing: control, data bases, developing confidence
- Geography: scale co-ordinates & grid references, statistics and data handling
- Design and Technology: measurement, shape, scale

7. Assessment and recording

7.1 Assessment

Gascoigne Primary School uses assessment to enable staff to understand what pupils have learnt before, what they need to learn now and what they will learn next.

Formative assessment

Formative assessment is ongoing and is built in daily, with opportunities throughout each individual lesson to assess pupils' knowledge, skills and understanding and will be used to inform teachers in relation to their planning, lesson activities and differentiation. Once the teacher is satisfied that the children have all accessed the learning, they have the opportunity to complete a workbook activity where they can demonstrate their learning.

Mathematics is assessed by the class teacher during lessons at the following times:

- During child-led conversations
- During independent work.
- During Journaling

This is done incisively, using immediate feedback to target understanding and misconceptions promptly.

Summative assessment

Summative assessment is completed termly by class teachers using Target Tracker online.

At the end of each term and school year, pupils will be assessed within 1 of the following bands:

- Pre-Key Stage (PKS)
- Working Towards the curriculum (WT)

- Working at Expected (EXP)
- Working at Greater depth (GDS)

Marking

Children receive regular feedback and marking follows the school's assessment & feedback policy. Please refer to the assessment & feedback policy for more details on how teachers mark recorded learning.

7.2 Recording

In mathematics, pupils will record their learning in the following ways:

- Maths Journals - This may take the form of photographs, pictures, notes or written work, and may be worksheet-based or fully independent.
- Workbooks
- Arithmetic books

8. Resources

Textbooks and other equipment

Every class has a bank of resources (hundred squares, multiplication squares, counting equipment, metre stick, Diennes equipment, 2D shapes, 3D shapes, mirrors, protractors, compasses and calculators.) Additional maths resources are stored in the Maths cupboard. Teachers are asked to give pupils as many 'concrete'/ real life experiences of maths to ensure that it is not taught in an abstract manner. It is crucial for pupils to actively interact with mathematical concepts to ensure that they are embedded and developed. Teachers are also encouraged to incorporate the use of technology in their lessons.

9. Roles and responsibilities

9.1 Headteacher

The headteacher at our school will:

- Support the subject leader but also hold them to account for the effectiveness of the subject
- Support staff through the provision of training and resources
- Monitor the planning and delivery of the subject
- Ensure the requirements of the National Curriculum are met

Discussions with pupils and members of the school council.

- - Encourage parents to take an active role in curriculum development;
- -Annually report to the Governing Body on the success and development of this policy
- Ensure this policy is reviewed according to the timescales set out
- Offer guidance, support, and training to all staff and monitor the policy's effectiveness by observing teaching and learning, conducting planning scrutiny and work trawls.

9.2 Subject leader

The subject leaders at our school will:

- Prepare and review subject policy and curriculum plans
- Promote the study of the subject throughout the school
- Monitor the teaching and assessment of the subject
- Attend appropriate CPD
- Stay informed regarding developments in the study and teaching of the subject
- Evaluate resources by conducting annual audit and inventory of resources, procure new resources when necessary and in preparation for the upcoming academic year.
- Provide training and CPD to staff on the subject curriculum and its delivery, and keep them informed about subject developments nationally
- Assess the impact of the subject curriculum on pupils' learning and development
- Make presentations to governors on the subject and how it is being taught
- Work co-operatively with the Headteacher, the designated governor, and the SENCO
- Supports teachers in their planning and teaching;
- Lead by example in the way they teach in their own classroom;
- Prepare, organise and lead INSET, with the support of the Head teacher;
- Monitor different aspects of maths teaching and learning feeding back to SLT and staff on findings and future actions through various methods:
    - Conducting audits
    - Observing lessons
    - Scrutinizing children's learning
    - Engaging in discussions with pupils
- Attend INSET provided by LA numeracy consultants
- Be available to discuss with the head teacher, class teachers, parents and mathematics governor the progress of maths in their class.

9.3 Link governor

The link governor responsible for Mathematics at our school will:

- Monitor the impact of the subject across the school and on pupils
- Monitor teacher workload and professional development
- Ensure subject action plans are suitable
- Monitor the quality of resources
- Keep track of pupil and parent engagement with the subject
- Keep up to date with the curriculum (what's taught, why it's taught, and how it's taught)

9.4 Classroom teacher

Classroom teachers at our school will:

- Teach and assess the subject according to the principles laid out in this policy

- Report to the subject leader
- Maintain subject knowledge and appropriate CPD
- Devise short term planning
- Have high expectations for all children and will provide learning that will extend them; - assess, record and report on the development, progress and attainment of pupils; - achieve high standards.
- Celebrate the success of pupils in lessons
- To deliver a Daily Maths lesson to their pupils which is engaging and motivating, ensuring that all the NC outcomes for Mathematics are effectively taught and achieved by pupils within their year group.

9.5 Parents

The parent community at our school will:

- Make sure their children are prepared for learning
- Encourage their child to complete their home learning in a suitable place and hand in home learning on time
- Be encouraged to take an active role in the life of the school by attending: - Parents and open evenings; curriculum development workshops
- To support their children's learning in maths by taking an interest in their child's progress, encouraging the children to complete maths homework and having a good relationship with the class teacher so that queries and problems regarding maths can be dealt with easily.
- Join the school in celebrating success of their child's learning;

10. Inclusion

For children who cannot access the Maths No Problem scheme for their year group, such as those with special educational needs and disabilities (SEND), our goal is to ensure that they can learn at their own pace while still making progress towards their age related goals. Some children may be placed in a math class that aligns better with their current level of attainment. For others, we will extract the fundamental principles of the scheme and teach them at a pace that suits their individual needs, utilising the same resources and concepts. It is crucial that these children always have access to manipulatives and regular opportunities to work with adults. To track their learning, we will annotate their progress to indicate which manipulatives and support were provided, such as using dienes with adult assistance.

In a mastery approach, differentiation occurs in the support and intervention given to different students, rather than in the topics being taught. The content taught remains the same, but the questioning and scaffolding provided to individual students in class will vary. Higher-achieving students will be challenged with more complex problems that deepen their understanding of the same content. Any difficulties or misconceptions that students encounter will be identified through immediate formative assessment and addressed through prompt intervention, ideally through individual or small group support later in the day or through student-teacher conferences (refer to the assessment and feedback policy for more details).

Additionally, we offer interventions during and after school for students who struggle with math, with a specific focus on those who are significantly below the national expectations for their year group and their numeracy age compared to their peers. These interventions aim to

provide structured small group sessions to students who have gaps between their actual age and their numerical age in mathematics.

Further information can be found in our statement of equality information and objectives, and in our SEN policy and information report.

11. Links to other policies

This subject policy links to the following policies and procedures:

- Calculation Policy
- Multiplication Tables Check, Arithmetic and Home Learning Overview
- Assessment & Feedback Policy
- Curriculum Policy
- SEND Policy

12. Monitoring and review

This policy will be reviewed by staff and governors every 2 years.

Appendices

1. Mathematical Key Questions
2. Multiplications Overview
3. NCETM Mathematics Glossary
4. Quick 6 challenge & Maths Sentence Stems