

CURRICULUM POLICY FOR MATHEMATICS AND NUMERACY

Imagine a School that will provide its pupils with lively, interactive learning experiences fostering their enjoyment of, confidence in, and enthusiasm for mathematics. Where Mathematics teaches pupils how to make sense of the world around them through developing their ability to calculate, to reason and to solve problems. It enables pupils to understand and appreciate relationships and pattern in both number and space in their everyday lives. Through their growing knowledge and understanding, pupils learn to appreciate the contribution made by many cultures to the development and application of mathematics.

Mathematics equips pupils with the problem solving skills that are needed in everyday life. It promotes sound numeracy skills; logical reasoning; attention to detail and helps pupils to understand the world around them. Mathematics encourages creative thinking when pupils are challenged by unfamiliar situations and provides the tools and language to communicate these ideas accurately. As a core subject, our Mathematics syllabus follows the National Curriculum and is allocated a significant amount of curriculum time at all key stages.

AIMS

The aims of teaching mathematics and numeracy are:

- To create a stimulating and challenging environment for pupils to gain the confidence and encouragement to fulfil their potential in this area of study
- To have a systematic but flexible and creative approach to solve problems, to reason, to think logically and to carry out investigations
- To develop the ability to use and apply mathematics across the curriculum and in real life
- To promote a self critical, reflective approach to learning
- To foster a determined and persistent approach
- To show initiative and an ability to work independently and in co-operation with others
- To be interested and motivated to succeed gaining satisfaction from their success
- To develop mental and oral mathematical skills
- To enable pupils to communicate their ideas both written and orally using good Mathematical English
- To ensure that pupils needing curriculum support are identified and catered for
- To ensure a broad and balanced mathematical education is offered to all pupils regardless of origin, class, gender, aptitude or disability
- To develop an understanding of the relationships in Maths through enquiry, discussion and experiment;
- develop a positive attitude to Maths realising its creative, aesthetic aspects and its relevance to real life situations.

Delivery of the Subject

Teaching should ensure that appropriate connections are made between the sections on number and shape, space and measures, handling data, problem solving. Maths should be taught using a range of approaches so that appropriate opportunities are offered to pupils. Work should be matched to the different capabilities of individuals or groups. Whole class, group and individual teaching should be offered, incorporating opportunities for discussion, practical work, consolidation and practice, problem solving and investigations. Mental practice should be emphasised at the start of each lesson. The aim is to raise pupil's awareness that there is a range of strategies for finding a solution.

The subject is delivered through the National Curriculum in Mathematics. A range of strategies are used to deliver the curriculum including:

- Problem solving and investigations
- Practical activities and mathematical games
- Whole class and group discussions and activities
- Mental and Oral Maths
- A range of methods of calculating e.g. mental, paper and pencil and using a calculator or other equipment
- Use of mathematical resources on the internet for demonstration, consolidation and revision
- Exposition by the teacher

- Working with computers as a mathematical tool and to develop logical thinking and reasoning
- Consolidation and practice

Pupils are encouraged to progress as far as their abilities allow by exposing them to work of increasing difficulty and challenge. A pupil who covers the basic work of a topic will be encouraged to move on to work that extends and consolidates their skills.

The Structure of Mathematics for Key Stages 1 and 2

During each year the pupils tackle a balance of theoretical and practical tasks. The schemes of work are adapted each year to ensure they are up to date. The learning objectives for each strand have been structured into five blocks. Each block is designed to cover either six weeks or nine weeks of teaching and has incorporated into it objectives from the 'Using and Applying Mathematics' strand and two or three of the other core strands. The blocks are:

Block A: Counting, partitioning and calculating

Block B: Securing number facts, understanding shape

Block C: Handling data and measures

Block D: Calculating, measuring and understanding shape

Block E: Securing number facts, relationships and calculating

Each of these blocks are made up of three units and, depending upon the number of weeks allocated to a block, will represent either two or three weeks of teaching. There are various ways that the units can be pieced together to provide pupils with a coherent learning experience (depending upon individual circumstances and pupil's needs).

The Structure of Mathematics for Key stages 3 and 4

End of Key Stage 2 assessment is used to support grouping decisions at the start of Key Stage 3. In Key Stage four the previous year's end of Key Stage assessment is used to support grouping decisions at the start of the new school year. Pupils across Key Stages 3 & 4 split into groups based on their ability, learning style and learning needs.

In KS3 and KS4 (Years 7-11) mathematics lessons are held on a daily basis and last for approximately 1 hour. The nature of the school is such that pupils entering KS3 can arrive in the years 7, 8 or 9 from their previous school. The programme follows the National Curriculum and is based on materials from the National Numeracy Strategy where appropriate. The Year 9 course is a mixture of extended Key Stage 3 topics and the start of topics that will be covered in the GCSE course. During the course of the year, as in all subjects across the school, pupils are given a taste of the GCSE course. The specific tasks undertaken in lessons are aimed at building up the pupil's experience, basic skills and knowledge.

The department is constantly striving to improve its schemes of work for all key stages and will endeavour to keep a broad depth staying up to date with current developments in the subject.

In Years 7-9, all pupils follow a core scheme of work. They are led through the four main areas of mathematics: algebra, shape and space, data-handling, and number. Pupils' knowledge and understanding of arithmetic is extended and they are exposed to the fundamental concepts of algebra. Pupils also learn basic geometry, co-ordinate geometry, probability, statistics, standard form, the laws of indices, and trigonometry.

In Years 10 and 11 pupils further develop their logical powers of prediction and deduction and an appreciation and understanding of axiomatic systems. We build on the foundations established in Years 7 and 8, and develop the skills covered in Year 9. They build skills in algebra, synthesis and analysis and encounter topics such as surds, quadratic equations and vectors.

Recording within Mathematics

It is important that pupils learn to communicate their ideas and record their calculations using good Mathematical English. Pupils learn a variety of methods of recording their work and are encouraged and helped to use the most appropriate and convenient method. Mental numeracy is an essential skill and pupils are encouraged to use mental strategies before resorting to written algorithm. Pupils use their exercise books to

work tidily and neatly when recording work. The learning objective should be clearly written at the start of each piece of work which must be dated.

Teaching Mathematics to Pupils with Special Educational Needs

At our school we teach Mathematics to all pupils, whatever their ability. Mathematics forms part of the school curriculum policy to provide a broad and balanced education to all pupils. Through our Mathematics teaching we provide learning opportunities that enable all pupils to make progress. We do this by setting termly individual targets and responding to each pupil's different needs. Assessment against the National Curriculum allows us to consider each pupil's attainment and progress against expected levels.

When progress falls significantly outside the expected range, the pupil 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 pupil to learn more effectively. This ensures that our teaching is matched to the pupil's needs.

Intervention will be put in place through the creation of an Individual Education Plan (IEP) for pupils with special educational needs. The IEP may include, as appropriate, specific targets relating to Mathematics. Where necessary the child will have additional LSA support either in the classroom setting or individual support in the learning support room. We enable pupils to have access to the full range of activities involved in learning Mathematics. Where pupils are to participate in activities outside the classroom, we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

Pupils who are gifted in Maths are extended through the use of more complex problems and investigations and may work on activities the year group above them are working through. Work is scaled up or down to enable all pupils to access the curriculum at a level appropriate to their needs. (See: Differentiation Policy.)

Assessment for Learning

Assessment for Learning is an integral part of the teaching and learning process. This is a partnership between pupils and teacher with the common goal of improving each pupil's understanding and skills. Throughout this process it is critical that pupils are involved in discussing and appraising their work and are made aware of their progress. Pupils should know, through discussion with their teacher, what the next steps are to improving.

Teachers use a combination of formative and summative techniques such as:

- Marking work
- One to one discussion with pupils
- Assessment of lesson objectives
- Observation of the pupil/s
- A mixture of open and closed questioning
- Frequent quick tests, written or oral
- End of Year formal testing and teacher assessments

Assessment and Reporting

It is the responsibility of the teacher to assess all pupils and to record and report the outcomes of that assessment. Work in mathematics will be monitored in a variety of ways. Teacher marking is always essential and valued by pupils and parents but there will be opportunities when pupils, particularly older pupils will benefit from marking their own exercises with routine practice and guidance from the teacher. Where appropriate, pupils are encouraged to check computational exercises with a calculator. This fosters independence in the pupils who can seek help if they are unable to locate and correct errors.

We assess pupil's work in Mathematics from three aspects (long-term, short-term and medium-term). We make short-term assessments which we use to help us adjust our weekly targets. These short-term assessments are made using Rising Stars. The Rising Stars Maths Tests provides assessment tests giving National Curriculum (NC) levels at the end of each unit and a combined NC level at the end of each term. These are recorded on the Teachers Drive as firstly a class record and secondly as a whole school tracking record displayed as an Excel Spreadsheet. We make medium-term assessments to measure progress against the key objectives. We use the assessment record sheet of the key objectives as the recording format for this. We make long-term assessments towards the end of the school year, using Granada Learning (GL) Assessments, and we use these to assess

progress against school and national targets. We can then set targets for the next school year. We make the long-term assessments with the help of end-of-year tests and teacher assessments. We use the GL Assessments tests for pupils from Rec to Year 6. GL Progress in Maths (PiM) tests are given annually from Reception to Year 9 so that progress can be monitored and tracked throughout the pupil's schooling at Magdalen Court School, areas of weakness can be identified and gaps in knowledge can be filled. Partial or Full Mock tests are used during KS4 to identify strengths and weakness in pupils learning and to track progression within mathematics.

- We also monitor the progress of pupils in KS2 using GL CAT3's (Cognitive Abilities Test 3) in the Spring Term.
- Formative Assessment is carried out informally by teachers in the course of a lesson. It is used to:
- Guide the progress of the individual.
- Identify this progress in each area of the subject.
- Determine what has been learnt.
- To decide upon the next stage – whether it is a progression or consolidation.
- Suitable tasks for Formative Assessment will include:
- Small group discussions about a practical task.
- Short tests in which the teacher questions orally and pupils record answers.
- Specific assignments for individual pupils according to ability.

The quality of marking is crucial. A simple x is of little or no assistance to a pupil unless accompanied by an indication of where and how the error occurred, together with an explanation, written or verbal of how to avoid it in the future. Marking should be both diagnostic and summative and is best done through conversation with the pupil. We keep detailed records of a pupil's progress and attainment and communicate this to parents in the following ways:

- Parent Consultation evenings and our open access policy at Pattisons keep parents fully informed of their child's mathematical development and an indication given as to whether academic expectations are being met.
- Regular reports detail their child's attainment and effort in the subject, including relevant test results. If a pupil is identified as having difficulty with any aspect of the mathematics curriculum the following process will be implemented:
 - Extra support and guidance from the mathematics teacher where strategies will be devised
 - Curriculum support offered if the difficulties persist, within the classroom or one to one

Mathematics Homework

Every pupil will be set two homeworks with a minimum total time as follows:

Years 1 & 2	20 minutes a week
Years 3 & 4	45 minutes every other week
Years 5 & 6	30 minutes a week
Year 7	40 minutes a week
Year 8	60 minutes a week
Year 9	80 minutes a week
Year 10	90 minutes a week
Year 11	120 minutes per week

Parents and Mathematics

Parents have a vital role to play in assisting their son or daughter's mathematical learning. Parents are asked to support their children by assisting them where appropriate, helping in the learning of tables with the younger pupils, telling the time and problem solving involving money with our youngest pupils etc. Parents should also ensure that set homework is completed satisfactorily.

Parents are encouraged to speak with the subject teacher about any concerns.

If significant change is to be made to the mathematics curriculum, parents will be kept fully informed and encouraged to comment.

Role of the Subject Leader in Mathematics

It is the responsibility of the subject leader in mathematics to:

- Have a thorough knowledge and understanding of the National Curriculum for Mathematics
- Review, revise and implement school policy for the Mathematics curriculum

- Undertake long and medium and short term planning for Mathematics and offer mathematical advice across the curriculum
- Monitor the budget for Mathematics
- Audit and organise resources for the subject
- Provide In-Service support for other non mathematics staff if necessary
- Promote their own professional development to keep abreast of latest developments in mathematics

Equal Opportunities

Every lesson at all key stages should be planned in such a way that it encourages full and active participation by all pupils, irrespective of ability, class, colour, gender or creed.

Display

Mathematical vocabulary should be clearly on display in every classroom used for the delivery of the subject. Every pupil should have the opportunity to have his or her work on display as it is important to celebrate, inform and consolidate personal and whole school learning.

Health and Safety

Consideration for Health and Safety is of the utmost important in mathematics. Appropriate storage and handling of materials is highlighted. Pupils are taught to follow instructions to control risk to themselves and others.

Key Development Plans

- Continue to develop resources to deliver learning objectives across Key Stages
- Identify and support those subjects using aspects of mathematics by making adjustments to the timing of some learning objectives within mathematics teaching and also using other, relevant, examples in lessons
- Continue to improve delivery of AO2 and AO3 (open ended problem solving)

Contribution of Mathematics to Teaching in Other Curriculum Areas

Pupils should view their learning as a whole rather than a set of disjoint subjects. We aim to do this in the following ways:

- Identifying and promoting transferable skills whenever they arise
- Identifying common themes across subject disciplines
- Using a wide range of contexts to introduce new ideas and concepts

English

Mathematics contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. For example, we encourage pupils to read and interpret problems in order to identify the Mathematics involved. The pupils explain and present their work to others during plenary sessions. Younger pupils enjoy stories and rhyme that rely on counting and sequencing. Older pupils encounter Mathematical vocabulary, graphs and charts when using non-fiction texts.

Information and communication technology (ICT)

Pupils use and apply Mathematics in a variety of ways when solving problems using ICT. Younger pupils use ICT to communicate results with appropriate Mathematical symbols for example, calculation games, problem solving, telling the time, etc. Older pupils use it to produce graphs and tables when explaining their results or when creating repeating patterns, such as tessellations and using a variety of learning games and resources. When working on control, pupils use standard and non-standard measures for distance and angle for example using bee-bots. They use simulations to identify patterns and relationships.

Personal, Social, Health and Economic Education (PSHEE) and Citizenship

Mathematics contributes to the teaching of PSHEE and Citizenship. The work that pupils do outside their normal lessons encourages independent study and helps them to become increasingly responsible for their own learning. The planned activities that pupils do during target time and within the classroom encourage them to work together and respect each other's views. We present older pupils with real-life situations in their work on the spending of money.

Spiritual, Moral, Social and Cultural Development

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

Monitoring and review

The monitoring of the standards of pupil's work and of the quality of teaching in Maths is the responsibility of the Maths coordinator. The work of the Maths coordinator also involves supporting colleagues in the teaching of Maths, being informed about current developments in the subject, and providing a strategic lead and direction for the subject in the school. The Maths coordinator gives the Headmaster an annual summary report in which they evaluate the strengths and weaknesses in the subject, and indicates areas for further improvement.

Date: August 2016

Signed:



Principle