



December 2018

Mathematics Policy

Why teach Mathematics?

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.

Aims

The teaching of mathematics at West Thurrock Academy is geared towards enabling each pupil to develop within their capabilities, not only the mathematical skills and understanding required for later life, but also an enthusiasm and fascination about mathematics itself. We aim to ensure that all pupils are proficient with their mathematical fluency, their ability to solve problems and to ensure they can use mathematical language eloquently and succinctly to reason verbally.

We are continually aiming to raise the standards of achievement of the pupils in West Thurrock Academy. We strive to empower students with the ability to independently identify strategies which will build firm foundations for all future mathematical use, for later schooling and for adulthood.

Rationale

Through mathematics in our school we aim to develop:

- ❖❖ Fascination and enjoyment of mathematics as a subject in which all children can achieve and be successful.
- ❖❖ The children's ability to use mathematics effectively, using specific mathematical vocabulary, to communicate their ideas. We see the process of children describing and explaining their ideas and methods as a key element in this area.
- ❖❖ Logical thinking and reasoning skills through natural curiosity and develop a methodical approach to solving problems.
- ❖❖ Accuracy in working and the importance of self-checking.
- ❖❖ Independent ways of working, encouraging children to explore ideas and activities in a variety of group settings.

- ❖❖ Co-operative ways of working encouraging children to explore ideas and activities in a variety of groupings.
- ❖❖ The children's ability to recall number facts quickly and accurately and use appropriate mental calculation strategies. This includes all children being able to recall multiplication facts up to the 12 times table by the time they leave Year 4.
- ❖❖ The confidence of our pupils and their ability to apply their mathematical knowledge and skills in a variety of challenging situations.
- ❖❖ The children's awareness of mathematics as a powerful tool that has applications both inside and outside the classroom.
- ❖❖ The children's awareness of the broad cultural background of mathematics.

Mathematics equips pupils with a uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem-solving skills and the ability to think in abstract ways as a way of fluently recalling number facts.

The Headteacher will:

- ❖❖ Set high expectations and monitor teaching and progress;
- ❖❖ Encourage a whole school approach, keeping parents, governors and all support staff well informed;
- ❖❖ Support the subject leader and individual teachers;
- ❖❖ Regularly review the mathematics action plan;

Governors will:

- ❖❖ Be well informed through the leadership of the Headteacher, Mathematics Leader and Mathematics Governor;
- ❖❖ Support the staff in implementing the school's Policy for Mathematics;
- ❖❖ Monitor and review progress on the Mathematics Action Plan;

The Subject Leader will:

- ❖❖ Ensure that the standard and profile of Mathematics remain high across the school;
- ❖❖ Lead by example showing a thorough understanding of the subject;
- ❖❖ Update the action plan that is focused on the needs of the school to ensure that the Mathematics is delivered and implemented effectively;
- ❖❖ Take the lead in policy and curriculum development;
- ❖❖ Review the Mathematics policy annually;
- ❖❖ Monitor and evaluating pupil progress and achievement;
- ❖❖ Monitor Mathematics throughout the school through book and planning checks, marking, evaluating teaching, interventions, samples of work and staff discussion of progression within classes, between classes and over time;
- ❖❖ Identify the strengths and weaknesses in pupils' work from across the school;
- ❖❖ Work with colleagues to regularly moderate pieces of Mathematics using end of year assessment criteria and levelling materials to ensure there is consistency across the school;

- ❖❖ Lead, audit and support colleagues to ensure consistency in different areas such as good quality of teaching, marking and assessing;
- ❖❖ Identify INSET needs, plan and deliver INSET;
- ❖❖ Monitor the deployment and provision of support staff;
- ❖❖ Organise workshops for teachers and parents.
- ❖❖ Monitor the quality of the learning environment and displays;
- ❖❖ Purchase and organising resources;
- ❖❖ Keep up-to-date with recent developments within the subject, network and share good practice and information to staff.

Teachers will:

- ❖❖ Hold a daily Mathematics session sharing clear learning objectives with the children;
- ❖❖ Use our 'Objectives and Success Criteria' cross-referenced with the National Curriculum References found in the year group NCETM document to aid planning;
- ❖❖ Tailor lessons to the children's interests as a way of heightening engagement;
- ❖❖ Use a range of teaching styles to incorporate:
 - direct teaching
 - whole class oral/mental sessions
 - modelling skills
 - group/paired work
 - individual work;
- ❖❖ Give homework activities in line with the school policy e.g. work based on key skills learnt that week, times tables and number facts;
- ❖❖ Set age appropriate targets for each pupil using End of Year Assessment Criteria which are reviewed at the end of each block;
- ❖❖ Prepare up to date Provision Maps, where necessary, which include age appropriate SMART targets;
- ❖❖ Ensure that they keep up-to-date with developments in educational policy, research and pedagogy and implement these within their planning.

In the daily mathematics lesson, teachers will:

- ❖❖ Share clear learning objectives with the children;
- ❖❖ Provide daily practice of mental skills including counting, rapid recall, newly learned facts and calculation strategies;
- ❖❖ Provide whole class interactive teaching with clear teacher exposition and modelling, both to introduce new concepts and to assess and consolidate what the children have learnt;
- ❖❖ Maintain good pace and use effective questioning;
- ❖❖ Model the use of mathematical vocabulary and insist on children using it correctly too;
- ❖❖ Engage pupils in challenging, differentiated activities to meet the learners needs using a range of resources, including ICT, models and images to fully involve children;
- ❖❖ Ensure differentiation through targeted, positive support to help those who have difficulties

with mathematics and to extend more able pupils;

- ❖ Address mathematical errors and misconceptions as they are identified in a positive and supportive way;
- ❖ Begin pupil's learning with concrete experience, before engaging pupils with visual aids as the step preceding children working abstractly;
- ❖ Ensure Support Staff are equipped to fully support the pupils in their class;
- ❖ Use the agreed planning set to support their teaching;
- ❖ Use the outdoor environment where possible to engage pupils in learning;
- ❖ Use mini plenaries when appropriate within lessons to assess and extend learning;
- ❖ Cross-reference key objectives with the End of Year Assessment Criteria to ensure these are met in-depth.

The SENCo will:

- ❖ Support the Mathematics Leader and teachers in dealing with children with special needs and encourage whole class inclusion where possible;
- ❖ Use the detailed objectives in the Framework when supporting teachers with Provision Maps.

Children will be encouraged to:

- ❖ Enjoy mathematics and see its relevance in real life;
- ❖ Understand exactly what is expected of them on a day-to-day basis;
- ❖ Develop mental calculation strategies so that their first reaction to a question is 'Can I do that in my head?'
- ❖ Develop and use the most efficient strategies when tackling calculations;
- ❖ Use mathematical vocabulary with confidence;
- ❖ Use their knowledge to solve problems, see patterns, make predictions, present information clearly, interpret data;
- ❖ Reason, justify and explain their methods.

Support staff will:

- ❖ Be included in staff training for mathematics where appropriate;
- ❖ Have a clear understanding of their role in each part of the lesson;
- ❖ Have a clear understanding of objectives for each lesson and know the key vocabulary to be developed;

Parents will:

- ❖ Be encouraged to develop positive attitudes to mathematics and actively support their children when homework is given;
- ❖ Be well informed of their child/children's progress through annual reports to parents' evenings.

Planning:

Class teachers in each year group are responsible for planning using their year group objectives. Wherever possible, lessons should aim to meet an objective by tailoring it to the children's interests as a way of heightening engagement.

Planning is undertaken at three levels:

Long term planning

West Thurrock Academy's key objectives for Mathematics are set out in the 'Objectives and Success Criteria' document for each year group. This document has been developed using the 'National Curriculum in England: Mathematics programme of study'.

Medium term planning

The planning structure is organised into three termly blocks (Autumn, Spring and Summer). The objectives for that term are broken down into weekly steps. There are four objectives to be met per week in addition to mental calculation practise and assessment.

Short term planning

This is carried out weekly. The objectives are taken from the medium-term documents. Short term planning includes learning objectives for the mental oral starter, the main activity and the plenary, resources to be used, differentiation, key vocabulary and key questions.

The short term planning is monitored by the Mathematics Leader and Senior Leadership Team (SLT) when necessary.

Use of ICT

ICT is used to support teaching and learning of Mathematics. ICT should be used wherever possible and appropriate to do so – when it positively supports, enhances or transforms the teaching of, and learning in, mathematics. All classrooms are equipped with a whiteboard.

Calculators are not be used as a substitute for good written and mental arithmetic. They therefore may be introduced near the end of key stage 2 to support pupils' conceptual understanding and exploration of more complex number problems, if written and mental arithmetic are secure. Teachers use their judgement about when ICT tools should be used.

Basic Skills and Cross-Curricular Links

The development of basic skills is integral to all Mathematical teaching and learning. Mathematics is taught mainly as a separate subject but every effort is made to link mathematics and apply their key

mathematical skills with other areas of the curriculum. We try and identify the mathematical possibilities across the curriculum at the planning stage. We also draw children's attention to the links between mathematics and other curricular work so children see that maths is not an isolated subject.

Teaching methods and approaches

Lessons generally follow 'three-part lesson' format with a mental and oral starter, a main activity and a plenary session.

The teaching of Mathematics at West Thurrock Academy provides opportunities for:

- ❖❖ Group work
- ❖❖ Paired work
- ❖❖ Whole class teaching
- ❖❖ Individual work

Pupils engage in:

- ❖❖ Rehearsal and rapid mental recall
- ❖❖ The development of fluent mental strategies
- ❖❖ Written methods
- ❖❖ Practical work
- ❖❖ Investigational work
- ❖❖ Problem-solving
- ❖❖ Mathematical discussion
- ❖❖ Consolidation of basic skills and routines
- ❖❖ Verbal reasoning to consolidate understanding

At West Thurrock Academy we recognise the importance of establishing a secure foundation in mental calculation and recall of number facts before standard written methods are introduced. We endeavour to set work that is challenging, motivating and encourages the pupils to talk about what they have been doing.

Organisation

Mathematics lessons are held on a daily basis and last for approximately 60 minutes. The children are taught in mixed ability classes. When children start in reception the organisation is more flexible with daily focused mathematical work in groups.

Display

We recognise the important role displays have in the teaching and learning of mathematics by having maths work displayed in the school. Every class will have a designated working wall which is updated regularly and relates to the week's objectives being taught. The working wall will reflect, support and extend learning, promote key skills and pupil independence. Key vocabulary and other display materials will provide a visual support for the children's mental processes.

Assessment and Record Keeping

At West Thurrock Academy we are continually assessing our pupils and recording their progress. We see assessment as an integral part of the teaching process and endeavour to make our assessment purposeful, allowing us to diagnostically set the correct level of work to the needs of the pupils, thus benefiting the pupils and ensuring progress. Assessment is carried out on three levels:

- ❖ Short-term assessments are an informal part of every lesson and are closely matched to the teaching objectives. These tend not to be recorded because they are for the teacher's immediate attention and action.
- ❖ Medium-term assessments are carried out every term. The purpose of these assessments is to review and record the progress the pupils have made in relation to the key objectives. Children's individual progress is recorded on their End of Year Assessment Criteria which is stuck on the inside back cover of each child's mathematics book. End of Year Assessment Criteria are at the centre of teacher assessments to track children's progress and inform teacher planning and are carried out termly. End of Year Assessment Criteria are informed by the evidence obtained from books whilst also taking into account short-term assessments which are an informal part of every lesson and are closely matched to the teaching objectives.
- ❖ Long-term assessments are carried out towards the end of the school year when pupils' attainment is measured against school and national targets. Individual End of Year Assessment Criteria records, SATs (years 2 and 6), optional SATs (year 3, 4 and 5) and an end of year assessment test (year 1) are used when forming an overall judgement of a child's attainment and progress. These are then diagnostically marked and handed on to the next teacher.

Reporting

All parents receive an annual written report which contains a summary of their child's effort and progress in mathematics over the year. The children's attainment from the end of year assessments is also included in the annual report. Parents also have opportunities to discuss progress at three parent consultation evenings. In Reception, children meet with their child's class teacher every six weeks where the child's progress and effort is discussed. Within curriculum newsletters, parents will receive information on areas of development in mathematics for their child.

Monitoring

The Mathematics Leader is primarily responsible for monitoring teaching and learning. This is done through data analysis, book trawls, planning scrutiny, lesson observations, staff discussions and audits of resources. The Subject Leader is responsible for reporting monitoring to the Headteacher. The effectiveness of the Mathematics Curriculum will be evaluated in discussions with teachers and the Headteacher. This evaluation process will then form the basis of an action plan.

Resources

Resources for the delivery of the mathematics curriculum are stored both centrally and within the classrooms. Everyday basic equipment is kept in classrooms. Additional equipment and topic-specific items are stored centrally.

West Thurrock Academy uses a variety of published materials to facilitate the teaching of mathematics and believes that the teaching of maths should not be 'scheme driven'. Materials are constantly updated, as new and relevant items become available. The Mathematics Leader orders new resources after consultation with the staff.

SMSC (Spiritual, Moral, Social and Cultural)

Mathematics can provide a contribution to pupils' SMSC by:

- ❖ Supporting whole school policy on issues such as discipline and behaviour.
- ❖ Group work on a shared topic or investigations promoting an appreciation of the input of all members of the group.
- ❖ Promoting positive attitudes towards maths through appropriate teaching strategies.
- ❖ Enabling pupils to acknowledge the important contribution made to mathematics by non-western cultures.

Special Educational Needs and Inclusion

We aim to fully include SEND pupils in the daily mathematics lesson and provide a supportive and flexible atmosphere in which all children are enabled to achieve success. Children are encouraged to take part in lessons and benefit from the emphasis on oral and mental work and by listening and participating with other children in demonstrating and explaining their methods. Planning is differentiated to enable success from all learners and activities are appropriate for all levels. Additional support staff support groups or individual children and they work collaboratively with the class teacher. Progress of children is closely monitored and any concerns are reported to the SENDCo.

Where necessary teachers will, in consultation with the SENDCo, draw up a Provision Map for a child. If a child's needs are particularly severe they will work on an individualised programme, written in consultation with the appropriate staff.

When planning, teachers will try to address the child's needs through simplified or modified tasks, using additional resources, visual aids or the use of support staff.

Within the daily mathematics lesson teachers not only provide activities to support children, who find mathematics difficult, but also activities that provide appropriate challenges for children who are more able in mathematics.

Homework

Children are given mathematics homework once a week. The amount of homework set is about 30 minutes in Key stage 1 and about 60 minutes in Key stage 2. Not all homework will necessarily be written work, which would need to be marked.

Equal Opportunities

The staff will aim to ensure that all children will have equal opportunity to develop their mathematical potential regardless of gender, ability, cultural or religious background.

Conclusion

This policy also needs to be in line with other school policies and therefore should be read in conjunction with the following school policies:

- ❖❖ Calculation Policy
- ❖❖ Teaching and Learning Policy
- ❖❖ Assessment and Record Keeping
- ❖❖ Provision Policy
- ❖❖ Computing Policy
- ❖❖ Equal Opportunities Policy
- ❖❖ Spoken Language Policy
- ❖❖ Classroom Environments Policy
- ❖❖ Display Policy