



Acton CEVC Primary School School Policy and Procedures Mathematics Policy
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1. Purpose

“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.

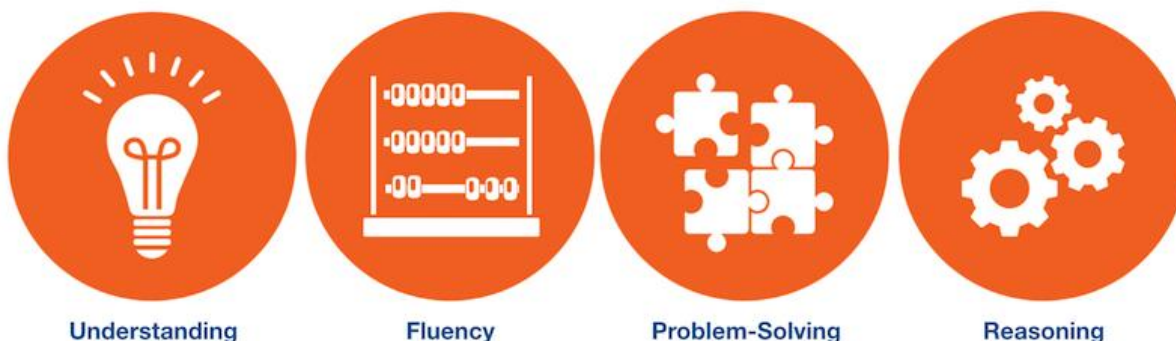
A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.”

(National Curriculum 2014)

2. Aims

The aims of mathematics at Acton CEVC Primary School are to develop knowledge and skills through:

- a positive attitude and growth mindset towards mathematics and an awareness of the relevance of mathematics in the real world;
- competence and confidence in mathematical knowledge, concepts and skills;
- a coherent knowledge of the key recall facts that enable fluent mathematical problem solving;
- an ability to solve problems, to reason, to think logically and to work systematically and accurately;
- initiative, perseverance and an ability to work both independently and in cooperation with others;
- an ability to communicate mathematically, using a deep understanding of the language and concepts concerned;
- an ability to use and apply mathematics across the curriculum and in real life;
- an understanding of mathematics through a clear process of instruction, enquiry and experiment.



3. Teaching and Learning

Each class teacher is responsible for the mathematics in their class, with guidance available from the mathematics subject leader. There is a consistent, fluency-focused approach across the school, with subtle variations according to the needs of pupils in each Key Stage:

3a. Early Years

In order to satisfy the mathematical objectives within the Early Years Foundation Stage (EYFS) framework, teachers use planning and resources from White Rose Maths, which ensures coverage across the year.

As well as this daily mathematics input, children take part in regular “Maths Meetings”, singing songs and using other techniques so that they can memorise key knowledge, like the days of the week, months of the year, ordinal numbers etc.

Teachers of the EYFS introduce new elements each term and ensure the children learn through a mixture of adult-led activities and child-initiated activities, using both the indoor and outdoor learning environment. One day each week is dedicated to number knowledge, using the BBC resource “NumberBlocks”.

3b. Key Stages One & Two

We follow a curriculum based on the “Target your Maths” scheme, by Stephen Pearce. This was introduced to Acton CEVC Primary School, during a visit to a high-performing local school. Through careful planning and preparation, we aim to ensure that throughout these years pupils are given opportunities for:

- practical activities and mathematical games;
- problem solving;
- individual, group and whole class discussions and activities;
- open and closed tasks;
- a range of methods of calculating.

Topics are covered sequentially and in depth, with time set aside for focused intervention in the second half of the Summer Term. Through our creative curriculum approach we also seek to use and apply mathematics across all subject areas.

Lesson Format

Lessons typically consist of starter activities, clear and concise teacher explanations of the content to be covered and shared worked examples, before pupils select independent tasks

from discrete levels of challenge. Opportunities for pupils to mark their own work are included with increasing regularity as they move through their school career. Plenaries are used to celebrate effort, progress and achievement and assess pupils in readiness for the next lesson.

Lesson Planning

Long term planning: The National Curriculum for Mathematics 2014 provides the long term planning for mathematics taught in these years.

Medium term planning: Years 1-6 use the “Target your Maths” Scheme Mathematics Planning Documents as their medium term planning.

Short term planning: Lessons are planned using a common planning format and are collected and monitored by the mathematics subject leader, before discussion during termly planning meetings.

Differentiation: Challenge and Support

In a typical lesson, children select a task at the appropriate level of challenge, depending on their current attainment and confidence, with the support of their class teacher:

- Section A tasks generally match requirements for the previous year’s work, providing support material;
- Section B tasks are based on the requirements for that year level. Most children should be able to work successfully at this level;
- Section C tasks provide extension material for the faster workers and those that need to be moved onto more challenging activities. Work in this section generally matches the requirements for the year above and can provide useful material for the plenary session.

Please see “Expectations of Mathematics Books at Acton CEVC Primary School” in the appendix for further details.

Working at Greater Depth

Students should be encouraged to explore and investigate topics in greater depth, so they build a stronger understanding of the main maths concepts within that topic. Hall, Strangman and Meyer (2003) say that *“Differentiated instruction allows all students to access the same classroom task by providing entry points, learning tasks, and outcomes that are tailored to students’ needs.”* In order to make differentiation successful, teachers adapt tasks to suit the needs of their pupils. Differentiation should be built into the lesson resources by the teacher, as they know their pupils’ progress and understanding best. Please see “Expectations of Mathematics Books at Acton CEVC Primary School” in the appendix for further details.

Deeper Learning Challenges

At Acton CEVC Primary School we include a range of challenging reasoning and problem solving questions at regular intervals throughout our mathematics units. These take the form of Deeper Learning “tickets” which are expected to be attempted at least once every two weeks.

nrich Problem Solving

At Acton CEVC Primary School we know the value of opportunities for pupils to investigate difficult problems for an extended period, so we include challenges taken from <https://nrich.maths.org/> at least once every half term.

3c. Whole School Teaching and Learning Approaches

Questioning

Questioning plays a crucial role in developing mathematical thinking, by helping students to identify thinking processes, make connections between ideas and build new understanding. Asking good questions can really develop students' understanding and further learning in the classroom.

At Acton we model good questions and answers in lessons. Students are encouraged to speak in full, correct sentences and need to be prepared to explain and justify answers when prompted. When students struggle with this it can be tempting to think or say "I know what you're trying to say..." and to move on, but this is not encouraged. Students are pushed to explain themselves with clarity and precision as much as possible.

Questioning is a useful way of engaging, supporting and challenging students. In this context, good questions prompt new thinking, probe understanding and promote discussion, pushing students outside of their comfort zone. Rather than accepting a given answer, teachers should always probe further by asking 'how' and 'why' questions.

Open questions are used to elicit responses from students that move beyond simply carrying out a calculation or procedure. Using open questions allows students to develop their thinking and problem solving skills and allows the teacher to make a more informed judgement about current understanding and misconceptions.

Arithmetic

At Acton CEVC Primary School, we have developed a system that builds our pupils' number knowledge and calculation skills as they move up through the school.

In Early Years, one lesson every week is focused on number (using the BBC resource "Number Blocks"). In Key Stage One, one lesson every week is dedicated to making progress in the online application NumBots. In Key Stage Two, pupils take and self-assess an arithmetic test linked to their yearly objectives, taking care to correct their errors and keep their number knowledge and calculation skills "on the boil".

Spaced Retrieval Practice

At Acton CEVC Primary School, we use Deepening Understanding Powerpoint slides in Years One to Six to ensure pupils have an opportunity to practice key concepts which are not part of their current mathematics unit focus. Each slide contains a collection of tasks taken from the relevant yearly objectives in the National Curriculum. We expect pupils to

attempt this work at least three times per week (on average) and encourage them to mark and improve their own work following teacher-led explanation.

Links to Other Curriculum Areas

English

We encourage children to read and interpret problems in order to identify the Mathematics involved. They explain and present work to others. Younger children enjoy stories and rhymes that rely on counting and sequencing. Older children encounter mathematical vocabulary, graphs and charts when using non-fiction texts.

Computing

The use of computers and tablets is built into the delivery of the Mathematics programme wherever possible. This enables the children to use and apply their developing skills in Mathematics in a variety of ways. Interactive white boards are used in all classes as an integral part of the daily Mathematics lessons to enhance teaching and learning.

Science and other curriculum areas

Mathematics is promoted across the curriculum at Acton. The subject leader audits use of mathematics across the curriculum regularly and feeds back to staff regarding areas of strength and weakness, identifying subjects that offer opportunities for applying mathematical skills i.e. use of timelines in history and accurate measurement and conversion in scientific experimentation.

4. Inclusion and Equal Opportunity

Inclusion and Intervention

The daily mathematics lessons are inclusive to pupils with special educational needs. Where required, children's IEPs incorporate suitable objectives from the National Curriculum for Mathematics and teachers keep these objectives in mind when planning work. These targets may be worked upon within the lesson as well as on a 1:1 basis outside the Mathematics lesson.

Maths focused intervention programmes are available in school to help children with gaps in their learning and mathematical understanding. These are available to be delivered on a 1:1 basis by trained support staff and overseen by the class teacher. We have used "Plus1" and "Power of 2" with pupils that could benefit from one-to-one support to catch up with their peers.

Within the daily mathematics lesson teachers must not only provide differentiated activities to support children with special educational needs but also activities that provide appropriate challenges for children who are high achievers in mathematics. It is vital that all children are challenged at a level appropriate to their ability.

A group of high-achieving mathematicians from years 5 and 6 have previously attended local secondary schools to work on elements of the curriculum in greater depth, and those

schools have also provided outreach maths sessions to years 5 and 6, working through complex problems as a whole class.

Equal Opportunities

We incorporate mathematics into a wide range of cross-curricular subjects and seek to take advantage of multi-cultural aspects of mathematics.

We ensure that all children are able to fulfil their potential regardless of race, religion, disability or gender.

5. Assessment

Marking, Feedback and Presentation

Teachers make regular assessments of each child's progress and record these systematically. A record of each child's attainment against their key objectives for the appropriate year group is recorded. Please see "Expectations of Mathematics Books at Acton CEVC Primary School" in the appendix for further details.

Short term

Children's class work is assessed frequently through:

- regular marking;
- cold and hot tests at the beginning and end of each unit to measure progress;
- analysing errors;
- questioning;
- discussion;
- plenaries.

This is used to inform future planning and teaching. Lessons are adapted readily and short term planning is evaluated and annotated in light of these assessments.

Medium term

Termly standardised assessments are carried out across the school using the PUMA (Hodder) assessment materials for each year group. These materials are used alongside judgements from class work to form a teacher assessment for each child. These judgements are used to inform pupil progress meetings, update the whole school data tracking system (Pupil Asset) and the assessment lead periodically analyses the results, sharing any trends or areas for improvement.

Long term

Year 2 and Year 6 complete SATs assessments in May.

Reporting to parents and parental involvement

Reports are completed before the end of the summer term and parents are given opportunity to formally discuss their child's progress at two parents' evenings in the autumn and spring terms.

Parents can make an informal appointment to discuss their child's progress at any time over the school year. Parents are encouraged and offered support and guidance to support their children's learning of mathematics.

6. Leadership and Management

Monitoring and evaluation

The mathematics subject leader monitors and evaluates the teaching of mathematics. Each half term the subject leader uses short lesson observations, pupil perception interviews and work scrutiny to monitor and evaluate the teaching of mathematics across the school.

Any observations are undertaken in line with the school improvement plan. Opportunities for teachers to review the scheme, policy and published materials are given during staff meetings.

Staff responsibilities

Headteacher/Deputy headteacher:

- lead, manage and monitor the development of mathematics in the school;
- support the mathematics subject leader in taking mathematics forward;
- carry out annual audits, set targets, review the action plan and monitor its progress;
- ensure that arrangements are made to meet the training needs of teachers and other adults involved;
- manage the school's allocation of resource funding, including leadership time;
- ensure parents are informed and involved.

Mathematics Subject leader:

- Assist the headteacher/deputy headteacher in carrying out the audit, reviewing and amending of the action plan;
- Prepare, organise and provide school based INSET meetings, workshops and staff meetings;
- Assist with the monitoring of teaching and planning and the analysis of SATs results;
- Preparation, review and implementation of school policy documents and guidelines taking into account the recommendations of the National Curriculum and EYFSP;
- Liaison with staff in school – working alongside them giving guidance and support;
- Maintain and co-ordinate the school's mathematics resources;
- Take responsibility for own professional development by attending courses and keeping up-to-date with current developments within mathematics education;
- Liaison with mathematics subject leaders in other schools through attendance of local network meetings;
- To provide an example to the school by taking a lead in teaching mathematics;
- Maintaining contacts beyond school with advisory staff and other outside agencies;
- Ensuring equality of opportunity for all pupils.

SENCo:

- Supporting and working co-operatively with the mathematics subject leader to implement and develop mathematics throughout school;
- Organising and providing INSET for staff linked to special needs mathematics issues;
- Advising staff how best to support children with varying needs during mathematics lessons so that they meet the expectations of the yearly teaching programmes where possible;
- Advising staff on the inclusion of mathematical objectives in IEPs for children with SEN in mathematics;
- Helping to ensure that children who are capable of catching up their peer group do so as quickly as possible;
- Advising staff on the effective use of teaching assistants and helping support staff to develop their role.

Class Teachers

Class teachers are responsible for the planning, teaching and assessment of the daily mathematics lesson and the organisation of additional adults in the classroom. They are also responsible for implementing the contents of this policy within their classroom.

Support Staff

HLTAs and TAs that work with the children support the teaching of mathematics under the direction of the class teacher.

Governing Body

An annual report is produced for governors, linked to the school's improvement plan. The curriculum committee reviews mathematics standards and teaching within the school, in order to report regularly to the rest of the governing body. The governing body reviews the Mathematics policy annually.

7. Professional development

All staff are encouraged to develop, assess and improve their teaching of mathematics. Whenever possible we:

- encourage staff to attend mathematics courses;
- make provision for the mathematics subject leader to work alongside colleagues in the classroom or shared areas;
- provide school based INSET;
- involve staff with policy and decision making;
- provide the opportunity to learn from colleagues' expertise;
- encourage parental involvement at home and in school-based workshops with their children.

8. Resources

All teachers should organise an area within the classroom dedicated to mathematics resources. This area is easily accessible to all children and allows them to become familiar with all resources. There should also be a working wall area within every classroom that the children can access. This needs to be updated regularly in accordance with the area of maths being taught at the time. Resources which are not used or required regularly are stored centrally.

9. Homework

It is our school policy to provide parents and carers with opportunities to work with their children at home. These activities are valuable in promoting children's learning in mathematics.

Homework mainly takes the form of computer-based fluency practice and individual worksheets, linked to the objectives taught in class that week.

In Key Stage One, pupils are encouraged to play NumBots (<https://play.numbots.com/>) regularly, in order to improve their rapid recall of addition and subtraction facts.

In Key Stage Two, pupils are encouraged to play Times Table Rock Stars (<https://play.ttrockstars.com/>) regularly, in order to improve their rapid recall of multiplication and division facts and to prepare them for the Multiplication Tables Check (MTC) in Year 4.

Pupils' achievements in the above web applications are celebrated in our weekly STARS assembly and on displays.

Additional activities may be sent home to children on a weekly basis as part of our home learning challenges. These can take the form of games, activities or quick written tasks and are set by the class teacher to match the work currently taking place in class.