

Bidford-on-Avon C.E. Primary School



Policy for Mathematics

Summer 2023

Introduction

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.

1. Purposes of Study and Aims

Mathematics teaching at Bidford-on-Avon C.E. Primary school provides mastery: a deep, long-term, secure and adaptable understanding of the subject, 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.

The aim of maths teaching is to:

- 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
- **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.

For parents to:

- Be actively involved in their children's mathematical learning.
- Understand and support the school's mathematics and homework policy and scheme of work.

2. Teaching and Learning

To provide adequate time for developing mathematical skills each class teacher will provide a daily mathematics lesson. This may vary in length but will usually last for about 60 minutes in Key Stage 1 and 2.

Throughout teaching, 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 a mathematical justification, argument or proof. Teachers assist them in making their thinking clear to themselves as well as others and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

From Year 1, all pupils will have a dedicated daily mathematics lesson. Within these lessons there will be a good balance between whole-class work, group teaching and individual practice.

A typical lesson

A typical 60 minute lesson in Year 1 to 6 will usually be structured like this:

1. Oral work and mental calculation - this will involve whole-class work to rehearse, sharpen and develop mental and oral skills.
2. The main teaching activity - this will include both teaching input and pupil activities and a balance between whole class, grouped, paired and individual work.
3. Mini plenaries - this can allow children to assess their own work, allow the teacher to work with the groups/whole class/individuals to sort out misconceptions, identify progress, to summarise key facts and ideas and what to remember, to make links to other work and to discuss next steps.
4. End of lesson plenary - this will involve work with the whole class to sort out misconceptions, identify progress, to summarise key facts and ideas and what to remember, to make links to other work, pupil self-assessment and to discuss next steps.

Basic skills

Pupils take part in weekly rapid recall number and times tables sessions which supports their fluency and their use of number.

We recognise the fact that in all classes there are children of different abilities in mathematics and we aim to provide suitable and challenging learning opportunities by differentiating tasks and giving additional support to children individually and in groups where necessary. We believe all students, whatever their ability, should have opportunities to develop reasoning and solve problems as well as fluency.

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.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems, offering depth before breadth. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Computing

ICT will be used in various ways to support teaching and motivate children's learning. ICT will involve laptops, ipads, calculators, and audio-visual aids. They will however only be used in a daily mathematics lesson when it is the most efficient and effective way of meeting the lesson objectives. Calculators should not be used as a substitute for good written and mental arithmetic. They should therefore only be introduced near the end of key stage 2 to support pupils' conceptual understanding and exploration of more complex number problems.

Parental support

Parental workshops and resources on our website are available to parents to support their understanding of how maths is taught, how calculation methods are structured and how maths can be used by pupils to solve problems and develop their reasoning skills.

3. Mathematics Curriculum Planning

Within Early Years Foundation Stage, the curriculum is broken up into the prime areas of learning such as Personal, Social and Emotional Development, Physical Development and Communication and Language, with a specific area for mathematics - numbers and shape, space and measure. Learning takes place through the characteristics of learning: playing and exploring, active learning and creating and thinking critically.

Mathematics is a core subject within the National Curriculum for Key stages 1 and 2.

Mathematics curriculum planning is organised in three ways, long term, medium term and short term planning.

Planning has the use of number at its heart, building confidence in the use of number, as the first step to competency in the curriculum as a whole. A focus on fluency, reasoning and problem solving gives the children the skills they need to become competent mathematicians.

Long term and medium term planning is structured following guidance set out in our White Rose Scheme which matches the New Curriculum for Mathematics 2014. White Rose is a small-step, mastery-based scheme of learning. Each block of knowledge is divided into a series of small learning steps. Together, these small steps cover all the curriculum content that pupils need to know. Brain science tells us that by learning maths in small, related chunks, pupils will remember more.

Long Term Planning provides a termly overview for each year group from Year 1 to Year 6. Each term is split into twelve weeks. These overviews are designed to support a mastery approach to teaching and learning and support the aims and objectives of the 2014 National Curriculum. The overviews have number at their heart. The long-term plan provides a guide to the appropriate time allocated to the different areas of maths. Teachers use their professional judgement and on-going assessments to inform and adapt their planning as and when appropriate.

Medium-term planning sets out the progression of blocks of learning/ maths curriculum objectives to be taught each term and shows the steps that will be followed within the White Rose teaching scheme.

Short term plans consist of a series of daily small step lessons focussing on a key objective developed through fluency, problem solving and reasoning tasks. Each daily folder uses resources from the White Rose Scheme along with other published resources

or the teachers own ideas. These are adapted to meet the needs of the class. Teachers use the White Rose Scheme format which should include the teaching powerpoints (adapted where necessary) and the mathematical language expected. Tasks and daily differentiated activities such as reasoning and resources are found within the daily lesson folder. A clear understanding and application of mathematical language is also vital to the development of pupil reasoning skills and staff encourage children of all ages to use mathematical terms accurately and consistently. Pupils are expected to complete a minimum of two problem solving activities a week.

Daily planning powerpoints should contain a slide identifying individual children requiring additional support from the TA or teacher during the lesson and any children struggling to make progress in the unit of work.

The timing allocated to teaching maths each term is outlined in the curriculum policy.

Manipulative resources

Pupils use resources that are designed specifically to be used with the scheme, so they support and enhance the teaching for mastery. Concrete manipulatives are fundamental to the powerful Concrete-Pictorial-Abstract (CPA) approach and are a key resource in developing a deep understanding of maths for pupils of all ages. Building on the concrete, pupils can make connections between concrete, pictorial and abstract ideas so they can truly master concepts, building on strong foundations.

Cross-Curricular links

At Bidford we believe it is important that meaningful links are made with other curriculum subjects throughout the whole school such as within our termly topics and science, as well as dedicated maths days e.g pirate maths day.

Well-being and SMSC

We provide an education that gives pupils opportunities to explore and develop their values and beliefs, spiritual awareness, high standards of personal behaviour, a positive caring attitude towards other people, an understanding of social and cultural traditions and an appreciation of the diversity and richness of other cultures, including British Values of democracy and equality. All curriculum areas have a contribution to make to the child's spiritual, moral, social and cultural development and opportunities for this are planned in each area of the curriculum. Maths provides pupils with an opportunity to develop their curiosity and thinking skills, to see how their own minds, as a tool, can manipulate the patterns and rules within the number system experiencing the frustration and joy of mathematical insight; see how geometric shapes mirror patterns in nature and how maths helps resolve real problems in the world around them.

Community cohesion and British values

Within mathematics, problem solving is developed to allow children to work as a team, to share with others, to develop a sense of fairness and to see how commerce and money are central to the day to day fabric of the society in which they live.

4. Management of Mathematics within the school.

The maths subject leader is responsible for:

- Compiling, carrying out and evaluating the school maths action plan.
- Maintaining and updating the subject leader folder.
- Coordinating subject assessment and monitoring.
- The organisation of maths resources within the school.
- Keeping informed of changes and updates in maths teaching, for example by attending Leading Learning Network, consortium or Local Authority meetings and feeding back information to the rest of the staff.
- Supporting the Senior Leadership Team in the monitoring of standards in children's work and of the quality of teaching maths.

5. Health and Safety

In organising fieldwork, visits, demonstrations or the use of equipment staff need to consider issues of health and safety and pupil safeguarding, referring to the relevant policy and documentation. They will also explain the reason for safety measures and discuss any implications with the children. Children will always be encouraged to consider safety for themselves, others and the environment and the resources they use, when undertaking Science activities.

The following considerations are carried out to prevent children from being put to unnecessary risk:

- All practical equipment is kept in good condition, stored safely and well-organised
- Children are provided with appropriate training in the use of equipment and are supervised where appropriate.
- Work areas are appropriately arranged to manage investigations
- Allergies and potential health risks are considered with all fieldwork and visits.

All trips/visits must be risk assessed and an EVOLVE risk assessment form completed and signed by the Educational Visits Coordinator (EVC). Follow guidance in the Educational visit policy regarding arrangements for all trips.

6. Safeguarding

All activities in maths will be managed within the guidelines stated in the school Safeguarding policy. All additional adults/volunteers supporting maths activities must be informed of their safeguarding duties and checked with the office/safeguarding leads for their suitability before being asked.

The use of digital devices and the internet by staff and pupils will be managed within the guidelines stated in the online safety policy.

7. Assessment and Recording.

Assessment takes place at three connected levels: short-term, medium-term and long-term. These assessments will be used to inform teaching in a continuous cycle of planning, teaching and assessment.

Teaching a block of work will need careful initial and ongoing planning, informed by an assessment of children's learning.

Ongoing assessment, based around the scheme uses an approach throughout as follows:

1. An appreciation of our number system and strong grasp of **place value**.
2. A really good bank of **number facts**.
3. An exposure to consistent **models and images**.
4. A comprehension of the key mathematical functions based on **doubling and halving**.

A cycle that supports this process in the Primary Framework for mathematics is set out below:

assess – plan – teach – practise – apply – review

Formative assessment is a part of every lesson to check understanding and give the teacher information, which will help to adjust day-to-day lesson plans. This is achieved through the observation and questioning of children, discussion, reflecting on errors, modelling, shared work and mini-plenaries. Older children are asked to reflect on their learning and, where appropriate, write reflective comments or 'top tips' at the end of a task. On completion of a piece of work, the teacher marks the work and comments as necessary, identifying good examples of work and areas to improve, next steps or questions. Pupils respond to marking as appropriate.

Mastery checkpoints are used to assess pupil's attainment against each of the areas taught away from the point of teaching.

To monitor progress throughout the year, end of block assessments from the White Rose scheme are used to inform future planning as well as end of term assessments, such as NFER tests. Data from these assessments is analysed to identify areas of strength and areas for improvement and to identify the progress of both individual pupils and pupil groups.

Evidence of assessment may also be made through the use of photographs and speaking and listening opportunities.

Long-term assessments take place towards the end of the school year to assess and review pupils' progress and attainment. These will be made through compulsory National Curriculum mathematics tests for pupils in Years 6 and supplemented by other materials for years 1,2,3,4 and 5 (see assessment policy). Teachers also draw upon their class record of attainment against key objectives and supplementary notes and knowledge about their class to produce a summative record. Accurate information will then be reported to parents and the child's next teacher.

At the end of each unit of work, the teacher makes a judgement about the skills and performance of each pupil if they have yet to attain, met or exceeded the unit objectives linked to the National Curriculum – a conglomeration of this data is used to assess pupils attainment at the end of the year. Key Stage teams complete a termly subject review, which support improvement in planning and resourcing of subjects and the subject leader completes an annual subject action plan/review and end of year subject report to support the monitoring of standards in the subject.

Self-Assessment

Where possible children should be involved in assessing their own work. (smiley face and/or a reflective comment)

Target Setting

A range of progressive targets are set termly based on the rapid recall number steps. Targets are based on information gathered from monitoring and evaluation for individual children.

8. Resources

Mathematics resources are kept centrally where there is equipment to support each unit of work. Each class is allocated resources particular to certain year groups. The White Rose scheme is available in school to support the teaching of Mathematics, along with associated videos, worksheets and problem solving within our school's "Shared Area" and the internet.

9. Monitoring and review.

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study. Monitoring of the standards of the children's work and of the quality of teaching mathematics is undertaken to ensure that pupils make the best possible progress. The annual maths action plan outlines yearly subject improvement tasks and reviews the previous year's actions. Subject leaders conduct termly/ yearly monitoring activities looking at standards, planning and pupil experience. Governors meet periodically with subject leads to review the intent, implementation and impact of their work.