

# Mathematics at Woodstock CE Primary



The intention of the mathematics curriculum at Woodstock CE Primary School is that children are taught to become competent mathematicians; we strive to embed the skills and processes necessary to enable children to use and apply their mathematical learning in a variety of contexts. We aim to develop children's enjoyment of mathematics and provide opportunities for children to build a conceptual understanding of maths before applying their knowledge to everyday problems and challenges. Our approach to the teaching of mathematics develops children's ability to work both independently and collaboratively as part of a team. Through mathematical talk, children will develop the ability to articulate and discuss their thinking. By the end of Key Stage Two, children will leave our school prepared for the next step in their mathematical education.

We recognise that in order for pupils to progress to deeper and more complex problems, children need to be confident and fluent across each yearly objective. To ensure consistent coverage across the school, we use a range of agreed materials and resources to provide age-appropriate tasks for our pupils: in turn, practising key skills and allowing children to become confident when working on key strategies, calculations or methods. To ensure our pupils acquire a deeper understanding in their mathematical learning journey, we supplement our resources by using the White Rose Maths Hub and NCETM Assessment materials to support the teaching of mathematics.

Within the Maths Hub schemes of learning, each National Curriculum objective is broken down into fluency, reasoning and problem solving; our teachers use the learning challenges to teach for mastery - an approach to extend and deepen the understanding of pupils within each year group. Our teaching staff use this document in conjunction with a range of high-quality resources such as Nrich and NCETM to support, stretch and challenge all learners within the classroom.

## National Curriculum for Mathematics

### PURPOSE OF STUDY

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 National Curriculum for Mathematics aims to ensure that all pupils:

- 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
- Can 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.

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 before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

At Woodstock CE Primary School we aim to:

- Develop a positive attitude to maths as an interesting and attractive subject in which all children gain some success and pleasure
- Develop mathematical understanding through systematic direct teaching of appropriate learning objectives
- Encourage the effective use of maths as a tool in a wide range of activities within school and, subsequently, adult life
- Develop children's ability to express themselves fluently, to talk about the subject with assurance, using correct mathematical language and vocabulary
- Develop an appreciation of relationships within maths
- Develop ability to think clearly and logically with independence of thought and flexibility of mind
- Develop an appreciation of creative aspects of maths and awareness of its aesthetic appeal
- Develop mathematical skills and knowledge and quick recall of basic facts in line with recommendations.

## **SUBJECT CONTENT**

### **KEY STAGE 1**

The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources, for example, concrete objects and measuring tools.

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

### **LOWER KEY STAGE 2**

The principal focus of mathematics teaching in lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of year 4, pupils should have memorised their multiplication tables up to and including the multiplication table for 12, and show precision and fluency in their work.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

## **UPPER KEY STAGE 2**

The principal focus of mathematics teaching in upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of Year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Pupils should read, spell and pronounce mathematical vocabulary correctly.

## **THE ROLE & RESPONSIBILITIES OF THE MATHEMATICS LEAD**

The role of the Mathematics Co-ordinators is crucial in developing mathematics teaching, learning and resources across the school so as best to support teachers, motivate pupils, monitor progress and achieve consistently high standards.

### **Strategic Direction and Development of Mathematics**

- To develop and implement policies and practices which reflect the school's commitment to high achievement through effective teaching and learning
- To have an enthusiasm for mathematics which motivates and supports other staff and encourages a shared understanding of the contribution the subject can make to all aspects of pupils' lives
- To use relevant school, local and national data to inform targets for development and further improvement for individuals and groups of pupils
- To monitor progress and evaluate the effects on teaching and learning by working alongside colleagues, analysing work and outcomes.

### **Monitoring Teaching and Learning**

- To use your own class as an example of high-quality teaching and learning in mathematics
- To ensure continuity and progression in the subject by supporting colleagues in choosing the appropriate sequence of teaching and teaching methods and set clear learning objectives through an agreed scheme of work, developed in line with the school development/improvement plan
- To establish clear targets for achievement in the subject and evaluate progress using appropriate assessments and records and regular yearly analysis of this data
- To evaluate the teaching of mathematics by the monitoring of teachers' plans and through work analysis, identify effective practice and areas for improvement, and take appropriate action to improve further the quality of teaching
- To develop effective links with the local community including parents, business and industry
- To ensure that teachers are aware of the implications of equality of opportunity which the teaching of mathematics raises.

### **Leading and Supporting Staff**

- To enable all teachers to achieve expertise in planning for and teaching mathematics through example, support and by leading or providing high-quality professional development opportunities
- To ensure that the Headteacher, SLT and governors are well informed about policies, plans, priorities and targets for mathematics and that these are properly incorporated into the school development/improvement plan.

### **Effective Deployment of Resources**

- To support the Headteacher by maintaining efficient and effective management and organisation of learning resources, by developing or identifying new resources, including ICT applications, for the subject
- To be aware of and respond appropriately to any health and safety issues raised by materials, practice or accommodation related to mathematics
- To support the Headteacher by maintaining efficient and effective management of the expenditure for mathematics
- To help colleagues to create a stimulating learning environment for the teaching and learning of mathematics
- To take on any additional responsibilities which might from time to time be reasonably determined.

The school uses a variety of teaching styles to cater for the variety of learning styles of pupils in mathematics lessons. Our principle aim is to develop children's knowledge, skills and understanding in mathematics. We do this through a daily lesson which includes whole-class and group direct teaching. During these lessons we encourage children to ask as well as answer mathematical questions. They have opportunities to use a wide range of resources such as number lines, number squares, digit cards and small apparatus to support their work. Mathematical dictionaries are available in classrooms. Children use ICT in mathematics lessons where it will enhance their learning, as in modelling ideas and methods.

In all classes there are children of differing mathematical ability. We recognise this fact and provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this through a range of strategies – in some lessons through differentiated group work and in other lessons by organising the children to work in pairs on open-ended problems or games.

### **CURRICULUM PLANNING**

Mathematics is a core subject in the National Curriculum, and we use the Primary Framework as the basis for implementing the statutory requirements of the programme of study for mathematics.

We carry out the curriculum planning in mathematics in three phases (long-term, medium-term and short-term). The Primary Strategy Framework gives a detailed outline of what we teach in the long term, while our three termly teaching programmes identify the key objectives in mathematics that we teach in each year.

Our medium-term mathematics plans are adopted from the Framework and give details of the main teaching objectives for each term, defining what we teach. They ensure an appropriate balance and distribution of work across each term. These plans are reviewed by the subject leader. It is the class teacher who completes the weekly plans for the teaching of mathematics. These weekly plans list the specific learning objectives for each lesson and give details of how the lessons are to be taught. The class teacher keeps these individual plans, and the class teacher and subject leader often discuss them on an informal basis.

Every class teacher will spend dedicated time with his/her TA to discuss the weekly plans in advance of the lessons.

### **TERMLY ASSESSMENT**

Children's attainment and progress towards targets is monitored in November, March and June using PUMA Autumn, Spring and Summer papers. The results of these tests will be recorded and progress towards the children's individual targets reported to the Headteacher and the Maths Co-ordinators. Any children whose progress may be a cause for concern will then be discussed and appropriate intervention/support agreed. Targets may also be adjusted if children have made better than expected progress to ensure appropriate challenge for all. Records are kept inside the cover of each child's maths book to show attainment in each objective covered in a particular term.

Scomis will be used to record and report termly assessments scores, and to inform monitoring conversations between the class teacher, Headteacher and SENCO at the end of every long term.

### **MORE ABLE CHILDREN**

More able children will be taught with their own class and stretched through differentiated group work and extra challenges. When working with the whole class, teachers will direct questions towards the more able (at their ability level) to maintain their involvement. In addition, children in Year 6 will receive extra 'booster groups' at the higher level to ensure that they are reaching their potential.

## **SEND CHILDREN**

Within the daily mathematics lesson teachers aim to provide activities to support children who find mathematics challenging. Children with SEND are taught within the daily mathematics lesson and are encouraged to take part when and where possible.

Where applicable children's IEPs incorporate suitable objectives from the Renewed Numeracy Framework and teachers keep these objectives in mind when planning work. When educational support staff are available to support groups or individual children they work collaboratively with the class teacher. The support teacher feeds back to the class teacher when appropriate to inform evaluations, assessment and future planning.

SEND children also have the opportunity throughout the year to take part in the Springboard and Wave Intervention Programmes that support them further, fill in any gaps in their understanding and enable them to reach their full potential.

## **SPIRITUAL, MORAL, SOCIAL & CULTURAL DEVELOPMENT**

Developing deep thinking and questioning the way in which the world works, promotes the spiritual growth of our pupils. In maths lessons, pupils are always encouraged to delve deeper into their understanding of mathematics and how it relates to the world around them. Sequences, patterns, measures and ultimately the entire study of mathematics was created to make more sense of the world around us and enable each of our pupils to use maths as a tool to explore it more fully. Pupils are able to experience the awe and wonder of mathematics in science, the arts and nature.

Problem solving skills and teamwork are fundamental to mathematics, through creative thinking, discussion, explaining and presenting ideas. Students are encouraged to develop their mathematical reasoning skills, communicating with others and explaining concepts to each other. Self and peer reviewing are very important to enable pupils to have an accurate grasp of where they are and how they need to improve. Working together in pairs or groups and supporting others is a key part of maths lessons. Pupils are always guided and instructed in valuing others' opinions and ideas; this extends to consideration for others in all aspects of life.

## **ASSESSMENT & RECORDING**

At Woodstock CE Primary School we recognise that AfL lies at the heart of promoting learning and in raising standards of attainment. We further recognise that effective AfL depends crucially on actually using the information gained. The assessment procedures within our school encompass:

- Short-term assessment will be an informal part of every lesson. The teacher will share the objectives for the lesson with the children and make sure they are clear what is being expected of them to successfully achieve the objective. This is a necessary part of assessment for learning and helps the children take ownership for their own learning. The short-term assessment will also involve the teacher checking the children's understanding at the end of the session to inform future planning and lessons. At the end of the lesson the children will self and/or peer assess their work to further inform the teachers and their own understanding of what they have understood.
- Using knowledge of pupils drawn from on-going pupil tracking records and key objectives records to guide our planning and teaching.
- Adjusting planning and teaching within units in response to pupils' performance.
- Use of information gained from statutory and optional tests. Analysis is done at both a quantitative and qualitative level. Information gained is used to set focused curricular targets (what to teach) and also to determine which strategies or methods are particularly effective in respect of specific areas of mathematics (the how and why).
- Work in mathematics can generate a great deal of marking and it is recognised that it is not always necessary to mark every piece of work. The children can sometimes mark exercises with support and guidance from the teacher. Where appropriate, children in KS2 are encouraged to check computational exercises with a calculator. This can foster independence in the children, who can seek help if they are unable to locate and correct their errors.
- In addition, at the beginning of every unit children will receive a target sheet that outlines the main objectives that will be covered. At the end of the unit children will reflect on their learning.
- The Maths Co-ordinators also set whole school home mathematics targets each term for each year group (Key Instant Recall Facts). These are shared with the children and their parents and are worked on at home to support their learning at home.

There are three connected levels of assessment. These include:

#### **LONG-TERM**

- End of Key Stage SATs and Teacher Assessments
- PUMA
- EYFS Profile

#### **Records**

- Record of attainment in individual objectives
- Scomis data

#### **MEDIUM-TERM**

- Assessment of Termly Objectives

#### **Records**

- Medium Term planning sheets detailing assessment opportunities
- IEPs

#### **SHORT-TERM**

- Informal assessments on a daily basis used to support planning

#### **Records**

- Written feedback on children's work using close the gap marking
- Pupils' self-reflection of lesson objectives and units of work

#### **MONITORING & REVIEW**

All teachers are responsible for monitoring standards but the Maths Co-ordinators, under the direction of the Headteacher take the lead in this.

Monitoring activities are planned across the year. In summary these are:

- Monitoring of class teachers' medium-term plans for maths by the Maths Co-ordinators and Headteacher. Individual teacher feedback provided by the Maths Co-ordinators.
- Monitoring of teaching and learning taking the form of a lesson observation once a year, learning walks, book looks and pupil interviews.
- Maths Co-ordinators and Headteacher to monitor results of Statutory Assessments, and termly PUMA assessment data
- Preparation of an end-of-year report for the governors by Maths Co-ordinators
- School Raising Achievement Plan (RAP)
- Headteacher to monitor annual reports to parents