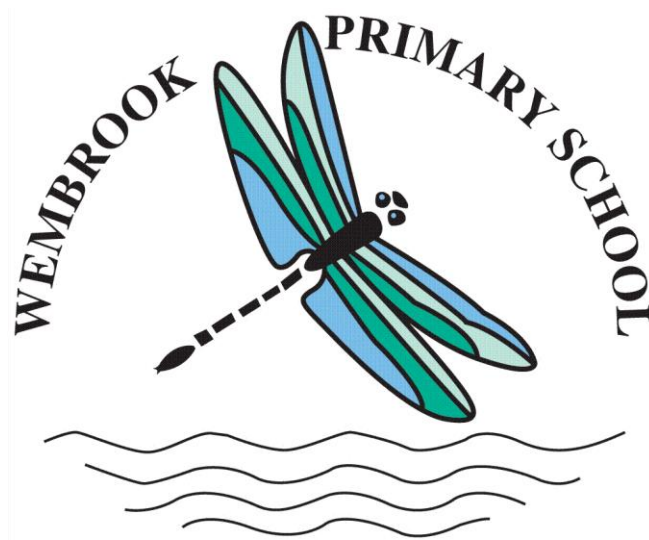


# Mathematics Policy



**Signed:**

**Headteacher**

**Chair of Governors**

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## **1. Introduction**

This document has been written for parents, governors and staff to highlight the range of mathematics at Wembrook Primary School. The previous policy was reviewed by the mathematics subject leaders with the help of the leadership team and discussed with the whole staff.

### **1.1. The Nature of Mathematics**

“Maths 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.” **New National Curriculum 2014**

## **2. Aims**

At Wembrook Primary School our aims for the children are:-

- 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.
- To reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- To 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.

**New National Curriculum 2014**

## **3. Key Skills**

Mathematics promotes the development of key skills:

- children’s communication skills so they can use the correct mathematical vocabulary to present a mathematical justification, argument or proof;
- application of number in real life situations;
- the understanding of information technology;
- working with others to meet challenges;
- children’s ability to review their own work and discuss ways to improve it;

- thinking skills, such as reasoning, enquiry, problem solving, hypothesising and evaluating answers.

#### **4. Entitlement**

The Mathematics Policy for Wembrook Primary School reflects the guidance and requirements of the New National Curriculum for Mathematics September 2014 and Curriculum Guidance for the Foundation Stage. All children have an entitlement to the programmes of study for each of the attainment targets at their own level.

#### **5. Implementation**

##### **General Objectives**

In order to achieve our aims we have these general objectives for the children. They should be acquiring and developing:-

- **Facts** – to include notation, mathematical vocabulary, a secure knowledge of number facts and a good understanding of the four operations on which all future number based work is dependent.
- **Skills** – including the use of number facts and procedures of arithmetic and algebra. Whilst drill and practice is a necessary part of mathematics, the developing skills should be applied to practical situations and applied to problem solving. Teachers should encourage the children to “talk through” their work to ensure understanding and develop their confidence to choose from a range of strategies to solve problems, including the use of a calculator when proficient in number.
- **Concepts** - Investigations and problem solving will enable the children to transfer their skills to new situations and make connections between the various parts of mathematics. Children should be encouraged to use practical resources at **all** levels and in **all** year groups.
- **Strategies** – Children should be encouraged to record their work clearly and use mental and written jottings to develop logical and systematic approaches to their work. They should be encouraged to use the most appropriate methods of working out and be taught to simplify tasks to make them more manageable, e.g. by estimating or working out approximate answers. They should be encouraged to check their answers by using other methods and by always looking for patterns which may help them to generalise. By the time pupils leave our school, children should have an efficient, reliable, compact written method of calculation for each operation, which they can apply with confidence when undertaking calculations that they cannot carry out mentally.

## **6. Numeracy in the Foundation Stage**

In Nursery and Reception, learning is planned and delivered taking into account the ethos of the Foundation stage using ‘Development Matters’ bands and by the end of Reception, the Early Learning Goals. There are opportunities in mathematics for all children to develop their understanding of number, measurement, pattern, and shape and space, by providing a broad range of contexts, in which they can explore, enjoy, learn, practise and talk about them.

Mathematics is integrated, where possible, across the whole curriculum with a balance of whole class, small group, paired and individual activities. These may be teacher led or independent. Mathematical understanding in the early years is developed through stories, songs, games and imaginative play. An active play based curriculum is central to mathematical development in the Foundation stage. By the end of the Foundation stage, Reception children will be well prepared for the mathematics session that will take place in Year 1.

Observation and assessment opportunities are planned for against learning objectives/success criteria in medium and short term planning. As recorded evidence can be less, knowledge of children’s progress can take the form of teacher observation and assessment records and photographs. The school uses iTRACK to record the children’s progress. iTRACK is used four times during the year to monitor children’s progress and identify individuals requiring additional help. At the end of Reception, the children are assessed against the Early Learning Goals and these are reported to parents at the end of the year.

**In Year 1, some children may still be working on the early learning goals.**

## **7. Mathematics Curriculum Planning at KS1 and KS2**

Mathematics is a core subject in the New National Curriculum for KS1 and KS2. The programmes of study for mathematics are set out year-by-year for key stages 1 and 2. As a school, we are only required to teach the relevant programme of study by the end of the key stage. Therefore, within each key stage, we have the flexibility to introduce content earlier or later than set out in the programme of study. In addition, we can introduce key stage content during an earlier key stage, if appropriate.

Our termly plans, which are adopted from the Classroom Secrets online materials, incorporate the New National Curriculum for Mathematics September 2014 requirements. They follow the recommendations of the White Rose scheme of learning and give details of the main teaching steps for each term and define what we teach. They ensure an appropriate

balance and distribution of work across each term and include many opportunities for the children to explain their thinking and sharpen their problem solving skills.

The planning lists the specific learning steps for each period of time and give details of how the lessons are to be taught, within a PowerPoint for each step. They are broken down into periods of time rather than single weeks and teachers can plan together to decide how many of the steps to cover within a week and how many days to teach each step. Differentiation is included in the children's work for Varied Fluency (practise) and Reasoning and Problem Solving. This gives the teacher the opportunity to provide work of an appropriate challenge to each child on a daily basis.

In addition, staff use mental/oral sessions outside of the normal maths lesson to help improve the children's instant recall of number facts. Half-termly targets are also based on these and are on display in classrooms and in children's prisms. Computing programs are also included as appropriate, for demonstration and modelling, as well as individual or group practice.

## **8. Teaching and Learning at KS1 and KS2**

The mathematics curriculum should be delivered to the children with pace and vigour to ensure that the children's mathematics ability is progressively increasing. To achieve this, children should be introduced to appropriate maths vocabulary, consistently used throughout the school, and be given a variety of teaching and learning styles in mathematics lessons, which include:-

- Structured direct whole class teaching.
- Group direct teaching.
- Individual, paired and group activities.
- Practical activities.
- Mental arithmetic.
- Open-ended and closed activities.
- Discussions with teacher and peers, including asking and answering mathematical questions.
- Practice and consolidation.
- Problem solving and investigation.
- Use of various resources and games.
- Computing – including interactive whiteboards, Numeracy websites, calculators
- Use of mathematical dictionaries and texts.

It is important to remember that mathematics is seen as a practically based area of the curriculum. Much emphasis should be placed on mental work and time spent exploring the mental methods used by the children in their calculations. Children should have the opportunity to use a wide range of resources, such as number lines, number squares, dice, digit cards and small apparatus to support their work. The children should always be

encouraged to verbalise and explain their mathematics to show and further develop their understanding of concepts.

Teachers look for opportunities to develop mathematics through other areas of the curriculum, for example interpreting and reading charts and scales in science, temperatures in geography, accurate measuring in design and technology projects or pattern work in art.

## **9. Grouping of children**

In accordance with the New National Curriculum 2014, the main part of the daily lesson is taught to the whole class. Children can then have the opportunity to be grouped in a variety of ways depending on the nature of the activity. They should have times of working in mixed ability, as well as ability groups. Usually at Wembrook Primary School, the children work in mixed ability classes but in Year 6, children are placed in sets, according to their ability, for part of the year.

## **10. Special Needs and Differentiation, Inclusion**

All classes at Wembrook have children with Special Educational Needs at both ends of the scale and they need to be taken into account when planning work. Regardless of the way children are grouped within the class, the mathematical activities presented to the children are differentiated.

To enable the children to fully develop their mathematical skills, understanding and confidence, the mathematics planned should be appropriate to the age, needs and maturity of the child. When planning the daily mathematics lesson, the teacher takes into account the child's performance in previous similar activities and differentiates according to need (modification or extension), pace, adult input, resources and outcome.

To aid differentiation, the teacher may make use of a classroom assistant to either work with those children experiencing difficulty, or to oversee others whilst the teacher works mainly with a group.

Gifted mathematicians are also supported by matching the challenges of the activities to the ability of the child and through the use of Reasoning and Problem Solving activities. Teachers should also look for opportunities to challenge able mathematicians through other subject areas.

## **11. How Children Record their work**

Children will record their work in a variety of ways and for a variety of reasons. It may take the form of drawings, graphical representation, diagrams, models mental jotting or written methods. There may also be opportunities for them to write in more detail to demonstrate their understanding through reasoning. Not all mathematical experiences will be recorded, as much valuable learning may take place during oral and collaborative work, which may not lend itself to formal recording. Also resources such as whiteboards may be used for the

children's recording when problem solving, for example, so that they can try out ideas and strategies freely. However, these may present the teacher with valuable assessment for learning opportunities.

## **12. Marking**

Children's work should be marked in green pen as soon as possible and relevant supportive comments made that move the children on where appropriate. Repeated mistakes on a child's work, marked with a cross, serves little purpose and should be avoided. Instead a constructive comment may be made linked to the learning objective where possible, followed by a verbal explanation to the child. Further guidance is given in the school marking policy.

## **13. Scheme of Work**

At Wembrook Primary School, the Classroom Secrets online materials have been adopted to run throughout the primary years. These are used as a source of teaching materials through PowerPoint presentations and they also provide differentiated work for the children, in both Varied Fluency (practise) and Reasoning and Problem Solving. They follow the White Rose scheme of learning and they support the New National Curriculum for Mathematics September 2014. Teachers are also encouraged to use material from other sources, e.g. Third Space Learning and Testbase. Further books and sources of ideas will be used where appropriate e.g. use of Internet sites like NCETM and NRICH, school bought resources, e.g. Rising Stars, Talk it, Solve it, I see Reasoning and Maths Mastery. A variety of Computing programs and apps can also be used to support children's learning.

## **14. Equal Opportunities**

Wembrook adheres to the guidelines given by the LEA concerning equal opportunities. We encourage positive attitudes towards mathematics for both boys and girls and for all cultures in our school.

## **15. Health and Safety**

Children should be supervised, particularly in the early years, when using maths equipment and they should be taught the correct usage of potentially dangerous equipment. It should also be taken into account that some children may have an adverse reaction when working on a computer and teachers should be aware of this. Equipment brought into the classroom by children or the teacher, for example for capacity work, should be examined carefully to ensure containers are thoroughly washed and unsuitable ones disposed of. The health and safety of the pupils will always be a prime consideration.

## **16. Parental Involvement**

Parents are invited to meet with the teacher to discuss their child's learning. They may be involved in helping their child with homework when it is set or they may be helping their

child to understand concepts by playing games. All parents are made aware of their child's numeracy targets at Parents' Evening meetings and/or through Link Books or on the children's iPads. These are normally changed every half term.

## **17. Resources**

There is a central resource which is arranged in relevant sections. In addition to this, each classroom has a stock of frequently used equipment which the children can get for themselves as and when they need it. The children will be taught how to use the equipment and when its use is appropriate, so that they will be able to make informed choices when working practically in Maths. Teachers in all year groups are encouraged to follow the 'Concrete, Pictorial, Abstract' model as shown in White Rose, so the children can always represent and explain their work in different formats.

## **18. Assessment**

Teacher assessment is an ongoing process, linked to lesson objectives. In continuous assessment, marking of work should be used positively in the planning of future work and next steps are added when necessary.

Staff use the iTRACK program, which is updated four times during the year, to record the children's progress and set new targets. This helps to highlight any individuals that are under and over achieving in Maths and helps staff to plan intervention groups in the following term to help them make more progress. These assessments also form the basis of the Appraisal process.

In addition, the school carry out all statutory requirements for standardised assessment at the end of Key Stages One and Two. On a yearly basis, the school may need to make special arrangements for the carrying out of the Standard Assessment Tests or Tasks which will be put into action as appropriate. Beginning in 2019, Year 4 children will be expected to complete a statutory mental times tables test. 'Times tables Rock Stars' has been subscribed to as a school resource, to encourage the children to learn their tables in a fun way. Reporting of teacher assessment levels are made to parents in Year 2 and both teacher assessment levels and test results are made to parents in Year 6, via the children's school reports. Other assessments may be reported to parents during parent consultations or within comments written on end of year reports.



## **19. Background Documentation (RENEWED FRAMEWORK)**

This policy was informed by:-

- reference to the Statutory Orders for mathematics and non-statutory guidance of the New National Curriculum Document for Mathematics;
- Ofsted reports on mathematics;
- The Early Learning Goals document;

## **20. Monitoring and Review**

Monitoring of the standards of children's work and of the quality of teaching in mathematics is the responsibility of the mathematics subject leaders, Phase Leaders, Deputy Head and Headteacher. The work of the mathematics subject leaders also involves supporting colleagues in the teaching of mathematics, being informed about current developments in the subject, leading staff inset, completing a subject audit and providing a strategic lead and direction for the subject in the school. If possible, the headteacher allocates management time to the mathematics subject leaders so that they can review samples of children's work, talk to the children and undertake lesson observations of mathematics teaching across the school.