William Shrewsbury Primary School

Maths Policy

'Ensuring that children have the mathematical skills and understanding to flourish in the wider world.'

RRSA Links: Our Maths policy links to Articles 28 and 29 in the Rights Respecting Schools.

WILLIAM SHREWSBURY PRIMARY SCHOOL

POLICY FOR MATHEMATICS

A Curriculum statement for mathematics

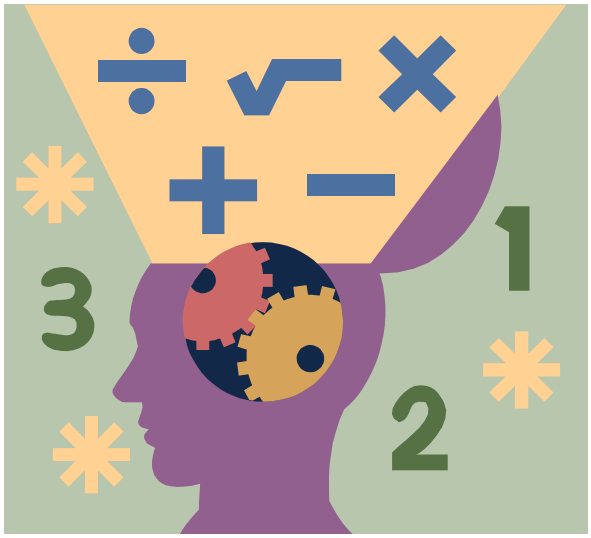
Maths is a key life skill. It involves confidence and competence with numbers and measures. It requires an understanding of the number system and an ability to solve mathematical problems in a variety of contexts through the use of reasoning skills and calculation knowledge. Maths also demands a practical understanding of the ways in which information is gathered by counting and measuring, and is presented in graphs, diagrams, charts and tables.

At William Shrewsbury Primary School we aim to develop positive learners who take pleasure in their mathematics. Teaching is underpinned by a belief in the importance of mathematics and that all children can succeed in learning mathematics, reaching their full potential. **Learning consists of much more than the knowledge of a set of useful skills. It should be a source of enjoyment, offering pupils intellectual stimulation and a sense of achievement.**

Maths can make a considerable contribution to the whole curriculum as work in many areas and topics involve mathematical activities.

The school policy is matched to the requirements of The New National Curriculum (2014) and aims to develop fluency, reasoning and problem solving through a Mastery approach.

Our Maths policy links to Articles 28 and 29 in the Rights Respecting Schools.



Revised Summer 2021 by Laura Nattrass and Adam Riley

REVIEW DATE Summer 2023

WILLIAM SHREWSBURY PRIMARY SCHOOL

AIMS

- To become fluent in the fundamentals of mathematics
- To reason mathematically and develop strategies for solving problems
- To develop the ability to think clearly and logically in mathematics
- To develop confidence, enjoyment and a positive attitude to mathematics
- To allow children to reach their full potential in mathematics
- To develop confidence in the use of mathematical methods
- To encourage the use of maths in cross curricular links
- To foster systematic, independent and co-operative work
- To develop confidence in the use of strategies for mental arithmetic
- To provide appropriate levels of challenge and support to enable children to make very good progress in mathematics.

OBJECTIVES

By the end of Key Stage Two, children should be able to:

- Understand and appreciate the importance of mathematics
- Apply arithmetic fluently to problems
- Apply, understand and use measures, make estimates and sense check their own work
- Pupils should apply their geometric and algebraic understanding, and relate their understanding to real life problems
- Work co-operatively to apply their skills to solve mathematical problems, including breaking down more complex problems into a series of simpler steps.
- Understand the cycle of collecting, analysing and presenting data.
- To think and work logically and independently in mathematics.

GUIDELINES - CRITERIA FOR GOOD PRACTICE

Pupils will use mathematics in practical activities, to solve real life problems and explore and investigate mathematics. This will enable pupils to communicate mathematically and develop ideas of argument and proof. Pupils will communicate, reason, enquire and solve problems. They will apply the skills learned in other areas of the curriculum.

Activities will include:

- Practical work such as building models, carrying out surveys
- Formulating children's own questions and investigations, prove its, etc
- Talking about work to adults or peers, explaining what has been done
- Thinking about and discussing mathematical ideas and problems
- Using mathematics in context
- Investigating and solving problems
- Relating new concepts to what has already been taught
- Trying out various methods, following the concrete, pictorial and abstract approach
- Observing what is happening and looking for patterns and relationships
- Listening to explanations, instructions, questions and answers

Number

- Number and place value
- Addition and subtraction
- Multiplication and division
- Estimating and rounding
- Fractions, decimals, percentages and their equivalence, ratio and proportion
- Properties of numbers and number sequences, including negative numbers

Number is central to the vast majority of mathematics and it is important that knowledge, skills and understanding are built up through the key stages. The early number work starts pre-school and it is important to plan progression in learning to take advantage of all prior knowledge and experiences the children have.

All children who attend the school are provided with experiences and mathematical strategies to develop their thinking and reasoning.

Planning for progression in number concepts has to acknowledge the range of abilities in all classes and how some pupils will need to use concrete materials and pictorial representations throughout the key stages before moving on to the abstract methods.

All understanding of number should be developed through work in context. This will encourage pupils to develop a 'feel' for number but they will still need reinforcement of number bonds and number facts so that these facts are fixed in the pupils' memory. At all levels pupils should develop fluency with their mental skills in number. Pupils should be encouraged to identify patterns and sequences in number through procedural variation including times tables facts. This will also lead into the understanding of algebra. The relationships between numbers and number patterns are the start of formal algebra and progression from early work with practical apparatus right through to the use of symbolic representation needs to be carefully planned.

The four operations of number – addition, subtraction, multiplication and division – must have a high priority in teaching and learning and pupils must understand what each one means. They should also be able to estimate answers, obtain correct answers consistently, use appropriate methods and know how to check that answers are sensible.

Geometry

- Direction and angles
- Properties of 2D and 3D shape, including symmetry
- Position, including co-ordinates

Much of the work in Geometry needs to be of a practical nature with ample opportunity for children to construct and experiment with shape, looking for common attributes, seeking patterns and relationships.

As children progress they need to be encouraged to move from classifying and describing shapes to identifying their particular properties. Children will be expected to hypothesise at all stages of development.

Measurement

- Measurement of length, mass, capacity, volume, perimeter, area and time

Initially, measurement is a comparison using non-standard units. This leads to a realisation of the need for standard measures. As children move through their programme of study the aim is to become more accurate and to develop the idea of approximation – skills will become more refined. The ideas of continuous and discrete measures develop as children progress through the key stages.

As often as possible the skills and concepts developed in number work should be used within an appropriate context in measurement. Contextual learning helps children to understand fully the many basic concepts in mathematics. It also demonstrates to children that measurement has a purpose and is vitally important across all aspects of the curriculum, not just mathematics.

Statistics

- Collecting, presenting and interpreting data

The starting point for all of the work within statistics should be the need to solve a problem. Pupils should formulate a question, undertake purposeful enquiries and collect data. The data should then be analysed, the analysis interpreted and then related to the original problem. The work should always be from a context the children are working within, either in mathematics or another area of the curriculum.

It is essential that from an early age pupils be given the opportunity to collect data, to organise it and to display it. The early work on display could be the use of real objects to indicate counts, leading to the idea of the use of equal units and a base line. The use of graphical representation needs to be continually extended, all the time reinforcing the need for accuracy, appropriate scales and the labelling of axes.

PLANNING

All planning is based on the statutory requirements of The National Curriculum 2014, this is a mastery curriculum. Teachers' planning will take account of individuals' needs including those who have low levels of prior attainment or come from disadvantaged backgrounds and children who are gifted. Our aim is to close the gaps between groups of children wherever necessary.

At William Shrewsbury Primary School, children in Years 2 to 6 are **set** for the majority of maths lessons. Short-term plans focus upon how to teach the objectives outlined in the medium term plans. Teachers will seek opportunities for assessment of key objectives alongside their planning.

EFFECTIVE TEACHING AND LEARNING

THE LEARNING ENVIRONMENT

Pupils should be working in an environment that is happy, stimulating and challenging. The enjoyment of mathematics is an achievable objective for all pupils.

There should be ready access to resources and apparatus to support children's learning. Pupils should feel confident to use them and access them as required.

TEACHING AND LEARNING STYLES

High quality teaching is a two-way process in which pupils are expected to play an active role by thinking of their own questions, explaining their ideas, answering questions with reasoning, contributing points and explaining and demonstrating their methods to the class. The reasoning behind mathematical processes is emphasised. Teacher/pupil interaction explores in detail **how** answers were obtained, **why** the method/strategy worked and what might be the most efficient method/strategy. Good direct teaching is achieved by balancing different elements, allowing the children to guide the lesson.

All lessons should be well paced and appropriately challenging for all abilities. We will also ensure a variety of teaching styles that take into account the learning styles of pupils. The learning needs of individual pupils are addressed through careful scaffolding, skilful questioning and appropriate rapid intervention, in order to provide the necessary support and challenge.

The approach to teaching mathematics by the staff of William Shrewsbury Primary School includes:

- A dedicated mathematics lesson every day.
- Children being encouraged to explain their reasoning and methods.
- Children learning through investigating, exploring, hypothesising, learning facts, questioning, testing hypotheses, persevering, practising and applying skills.
- An emphasis on mental calculations.

CLASS ORGANISATION

TEACHING TIME

At William Shrewsbury Primary School teachers will provide a daily lesson lasting about 55 minutes in Key Stage 1 and 60 minutes in Key Stage 2.

In the EYFS, children are supported in developing their understanding of Mathematics (Number and Shape, Space and Measure) in a broad range of contexts in which they can explore, enjoy, learn, practise and talk about their developing understanding. They are provided with opportunities to develop and improve their

skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, spaces, and measures. The environment, both indoors and outdoors, is carefully planned so that children can initiate activities and also have the confidence to talk about their mathematical learning.

By the end of the EYFS, children should be able to:

- Have a deep understanding of number to 10, including the composition of each number.
- Subitise (recognise quantities without counting) up to 5.
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.
- Verbally count beyond 20, recognising the pattern of the counting system.
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.
- Select, rotate and manipulate shapes in order to develop spatial reasoning skills.
- Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.
- Continue, copy and create repeating patterns.
- Compare length, weight and capacity.

CROSS CURRICULAR LINKS

As well as being a core subject, mathematics is linked to many other areas of the curriculum. Children learn more effectively where a context is meaningful and teachers should therefore try to capitalise on these links wherever possible. For example during a science investigation, pupils will measure data and record information appropriately. Measure and geometry link to many subjects such design and technology, geography and art.

RECORDING AND LAYOUT OF WORK

- Years 1 to 4 will use books with 1 cm squared paper; years 5 and 6 will use books with ½ cm squared paper.
- Written work will include the date in numerals and the learning objective (written as a title in year 1). It may be written by an adult - either as part of the marking or the title, depending on the ability of the child.
- Children will be encouraged at all times to present their work neatly.
- A 'J' will be used to indicate jottings in their books.
- The success criteria will be shared or created with the children in every lesson.
- Recording of mathematics will mainly be as directed by the school's calculation policy. However, children will be encouraged to record their jottings, calculations and their findings as appropriate.
- Children will be encouraged to use mathematical vocabulary in their written work.

THE USE OF COMPUTING IN MATHEMATICS

Computing is a very powerful tool for the learning and teaching of all areas of mathematics. Use of the interactive whiteboard, floor robots, iPads and Primary Maths programmes are used across all year groups.

CHILDREN WITH SPECIAL EDUCATIONAL NEEDS

The National Curriculum sets common programmes of study and attainment targets for all children. Nevertheless, the individual needs of each child should be catered for. Pupils with special educational needs make up a very diverse group and it is important to treat pupils individually. This includes children with learning difficulties as well as those who exceed educational expectations (Gifted and Talented).

It is the responsibility of the class/set teacher to ensure that appropriate planning, activities, support and any special equipment needed is made available for children with Special Educational Needs.

We acknowledge that for all pupils (and specifically those with specific learning difficulties SpLD) their needs are best met by providing a multi-sensory curriculum delivered through a variety of teaching and learning styles. We aim to ensure that the teaching and learning in Maths is planned and delivered to meet these specific needs.

The following support strategies are implemented:

- A buddy system
- Allowances for homework – amount/time spent/type of expected outcome etc
- Teacher/support/buddy to log homework tasks for the child
- Consideration of recording methods in class/outcomes (e.g. less writing/PC based/pictorial/taped/partner work)
- Clear organisation of resources
- Assisting pupils with personal organisation of resources where memory skills might be a problem, at home and at school
- Consideration of pupil's difficulties when marking work
- Providing advice for parents to support pupils at home
- Appropriate differentiation of task

MARKING, ASSESSMENT AND RECORD KEEPING

It is a legal requirement to report on children's progress in mathematics on an annual basis. It is the teacher's responsibility to maintain a continuous record of a pupil's achievement.

Each term children undergo assessments (Autumn, Spring and Summer). The children's progress is then tracked using an internal tracking system. Children requiring intervention strategies are identified and discussed during pupil progress meetings. The assessment may cover specific concepts or it may take the

form of a more general test at the end of each half term. To assess pupils we use teacher assessment, SATs, SATs online and other commercial materials. In Year 2 and Year 6 the pupils will be formally assessed with the end of key stage tests.

See the assessment and marking policies for further details.

CURRICULUM TARGETS

All children have Maths Target Mats to work towards. These are age related and are linked to the number elements of the National Curriculum, with an aim to increase mental fluency. Each half term children are tested on all areas of the maths mat, they are re-tested at the end of the half term. The test results are analysed by the maths leaders and children who do not make progress are highlighted and targeted for support for the next half term.

HOMEWORK AND PARENTAL INVOLVEMENT

Homework activities are set on a regular basis in accordance with our homework policy.

Parents are given the opportunity to become involved with their child's education in mathematics through Family Learning initiatives, after school clubs, workshops and parent information evenings.

BASIC SKILLS STATEMENT

At William Shrewsbury we are committed to improving children's basic skills in mathematics. We aim to maintain consistently high expectations where children are required to apply these skills in the context of all other curriculum areas.

HEALTH AND SAFETY

Staff are responsible for the health and safety of all pupils in their care whilst involved in organised work activities both on site and off site. Class teachers should be aware of the school's Health and Safety policy.

EQUAL OPPORTUNITY

Teachers need to be aware of the issues and attitudes relating to ethnicity, gender, ability and social circumstances. They need also to be aware of the attitudes and expectations with regard to the very able and least able children in school. The fundamental aim should be to provide equal opportunities for all pupils in mathematics. Planning should demand high expectations of all children.

CURRICULUM MANAGEMENT

Monitoring and Evaluating – Teaching and Learning Responsibilities

- Impact on educational progress beyond assigned pupils.
- Lead, develop and enhance the practice of others.
- Accountability for leading, managing and developing mathematics.
- Support staff in promotion of enrichment activities.
- Develop creative and enrichment activities across the curriculum.
- Organise and manage resources.

The role of the Head Teacher and Governing Body

The head teacher is responsible for managing the curriculum with the school's governing body. They will ratify the school policy, which defines good practice. The school has a named governor who will support and work alongside the subject leaders.

As managers, they will:

- Give opportunities to the leaders to lead and share their expertise with colleagues
- Organise book trawls, lesson observations and pupil progress meetings.
- Provide adequate funding and time for mathematics
- Give opportunities for parents and governors to be informed about mathematics in school
- Provide a system that monitors the professional development of those who teach mathematics.

DEVELOPMENT AND REVIEW

William Shrewsbury Primary School is committed to the continued development and improvement of mathematics. This commitment is reflected through the cyclical process of development and review of the mathematics policy and the monitoring and evaluation of teaching and learning in mathematics.

L.Nattrass and A.Riley Summer 2021