

**Mathematics Policy**

**Statement and Rationale**

This policy reflects Rowena Academy’s aims and objectives in relation to the teaching and learning of Mathematics. It sets out a broad framework within which teaching staff can operate and outline principles of planning, teaching and assessment. This policy reflects our commitment to deliver excellence in teaching and to act in accordance with, or to exceed, statutory requirements. It should be read in conjunction with the National Curriculum and the Early Years Foundation Stage Framework, which set out the rationale for the teaching of the Mathematics curriculum and specify the skills to be developed by the majority of pupils in each year group.

In the Early Years Foundation Stage, Mathematics involves providing children 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 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.

This policy supports our school vision statement of ‘hand in hand together we can’. It also supports our whole school ethos of developing a Rowena Person.



**Aims and Objectives**

At Rowena, Mathematics is taught in a way that enables children to make sense of the world around them by understanding relationships, patterns and changes in quantity, space, shape and measure in everyday life.

We aim to:

* Build on the earliest perceptual and cognitive learning through to problem solving and reasoning in real life situations.
* Foster a positive attitude to Mathematics as a motivating, stimulating and challenging area of the curriculum, enabling children to approach mathematical activities with confidence and understanding.
* Develop the confidence of children to enable them to use and apply their mathematical knowledge and skills with independence in other areas of the curriculum and in the real-life contexts of the wider world.
* Develop the ability to use Mathematics as a means of communicating ideas using appropriate mathematical language.
* Develop an understanding of the connectivity of patterns and relationships within mathematics.

Our objectives in the teaching of Mathematics skills are for pupils 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.

**Intent**

At Rowena Academy, we believe that Mathematics is a fundamental life skill that equips learners for today and prepares them for their future. Our intention is to engender a passion for Mathematics and to strive to progress children’s mathematical thinking to develop independent, resilient mathematicians. We intend to inspire our children to enjoy, be enthusiastic and feel confident about Mathematics.

Mathematics is a creative and highly interconnected 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.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The National Curriculum 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.

At Rowena Academy, we deliver engaging daily lessons, building children’s knowledge and skills. At each stage of learning, children should be able to demonstrate a deep, conceptual understanding of the topic and be able to build on this over time. The deepest levels of learning are what we are aiming for by teaching Mathematics using a mastery approach. In conjunction with our calculations policy, we aim for our learners to transfer a progression of key basic Mathematical facts and knowledge to their long-term memory, to enhance their ability to recall and apply them. Through the mathematical journey, we interweave fluency, reasoning and problem solving to develop a mastery level of skills within our Mathematics curriculum year on year. Using the White Rose Maths Hub schemes of learning as a basis, we intend to extend and deepen the understanding of pupils within each year group.

Our intent is that pupils who grasp concepts rapidly should be challenged. They will be offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding. This is done through the Same Day Intervention approach.

**Implementation**

At Rowena Academy, we strive to ensure that children are taught to become competent mathematicians by embedding the knowledge, skills and processes necessary to enable children to use and apply their Mathematical learning in a variety of contexts. We approach the teaching of Mathematics with a pedagogy that develops the child's ability to work both independently and collaboratively. Through mathematical talk, children will develop the ability to articulate and explain their thinking.

Our policies, resources and schemes of learning support our vision e.g. Delta Calculations Policy, White Rose Maths Hub and NCETM Teaching for Mastery. Our resources allow us to better use models and images to support learning in each area, which in turn are reinforced by mathematical learning walls in every classroom, reflecting the needs and stage of learning of the pupils using it. Children are familiar with these and are able to access them independently where needed as their strategies develop towards complete impendence, followed by appropriate next steps. In turn, these policies, resources and schemes of work will also support learning and application in different contexts across the curriculum.

The use of correct mathematical vocabulary is firmly rooted and applied across the curriculum. Children are expected to use this vocabulary to articulate and explain their ideas. A progression of mathematical vocabulary acquisition forms part of our wider scheme of learning for maths.

In order to fully implement this overview, we recognise the need for multiple representations for all learners in terms of concrete, pictorial and abstract stages of development. The mastery approach incorporates all of these to help children explore, explain and demonstrate mathematical ideas, enrich their learning experience and deepen understanding. Together, these elements help cement knowledge, skills and processes therefore children truly understand and apply what they have learned at whatever stage in the journey they are at.

In summary, implementation of the Mathematics curriculum at Rowena Academy is based on the following key principles:

* Dedicated Mathematics lessons every day.
* Direct teaching and interactive oral work with the whole class and groups.
* An emphasis on mental calculation and rapid recall to develop fluency.
* Appropriate differentiation, with all pupils engaged in Mathematics relating to a common theme.
* The principles of assessment for learning.
* Same Day Intervention (SDI).

**Impact**

The impact of our Mathematics curriculum is that children are confident in making rich connections across mathematical ideas as a result of developing fluency, mathematical reasoning and competence in solving increasingly sophisticated, contextual problems during their time at Rowena Academy.

Children understand the relevance of what they are learning in relation to real world concepts. We foster an environment where Mathematics is enjoyable and it is encouraged to hypothesise with confidence because the journey to finding solutions is so important.

Our feedback and interventions are supporting children to strive to be the best mathematicians they can be, ensuring the highest proportion of children are on track.

Impact will be upon:

* Quick recall of facts, strategies and procedures.
* The flexibility and fluidity to move between different contexts and representations of mathematics.
* The ability to recognise relationships and make connections in mathematics.

A mathematical concept or skill has been mastered when a child can show it in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations.

**Teaching and Learning**

The principle 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 e.g. concrete objects and measuring tools. At this stage pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use 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. Pupils should read and spell mathematical vocabulary at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

In the Foundation Stage, children learn Mathematics in a wide range of contexts both indoors and outdoors. Continuous provision allows children the opportunity to follow their interests and explore different aspects of Mathematics independently.

Our Academy uses a variety of teaching and learning styles in Mathematics. Our principal aim is to develop children’s knowledge, skills and understanding through a daily lesson that has a high proportion of whole-class and group teaching, followed by opportunities for individual or group activity to embed and enhance learning.

During these lessons we promote learning by encouraging children to pose as well as answer mathematical questions. Teachers use a range of questions to develop mathematical thinking with the whole class, a group of pupils, or individuals within guided group work. Teaching strategies are varied and encourage a high level of interaction.

High quality direct teaching is achieved by balancing the following elements: directing, instructing, demonstrating, explaining and illustrating, questioning and discussing, consolidating, evaluating pupils' responses, and summarising. Children must be encouraged to explain their thinking, discuss their work, hypothesise and justify with a strong emphasis on the development of oral skills and positive behaviour for learning attitudes.

In Year 2 we group the children by ability. The year group is split into three groups: a higher ability group and two mixed middle and lower ability groups. The rationale for setting is to allow for highly focussed group teaching across a broad range of ability. In this way we are able to match the work very closely to the child’s needs and also enable extended time for some children to grasp and understand new concepts and techniques.

Depending on the range of ability in Year 1 cohorts, we may decide to set for teaching after the first or second term.

Pupils have the opportunity to use a wide range of resources and concrete apparatus to support their work. Children use ICT and computing skills in their Mathematics lessons, through the interactive whiteboard, laptop computers and tablets, which enhances their learning through modelling ideas and methods. They use simple databases and statistics programmes.

Wherever possible, we encourage the children to use and apply their learning in everyday situations.

There is a strong emphasis on the development of mental calculation skills and arithmetic. Children are asked to explain their methods and to check for ‘reasonableness’ as they check their answers. There is also strong emphasis on the development of mathematical vocabulary. Key words, symbols and methods are displayed and staff ensure that they model the correct use of mathematical vocabulary. Teachers value pupils’ oral contributions and create an ethos in which all children feel they can contribute.

Classroom Assistants are deployed to support the teaching of Mathematics and also provide extra help and support and challenge for children with a variety of particular needs, by means of differentiated activities and support plans. They also lead intervention groups as appropriate.

It is important that in other subjects pupils have the opportunity to develop and apply their mathematical skills appropriate to their learning needs and development. Mathematics contributes to many subjects of the primary curriculum, often in practical ways, which will provide opportunities for discussion and for applying and using Mathematics in real contexts.

**Mathematics Curriculum Planning**

Mathematics is a core subject in the National Curriculum. We use a broad range of resources, apparatus and ICT as the basis for implementing the statutory requirements of the Programme of Study for Mathematics, as stated in the National Curriculum.

We carry out curriculum planning in Mathematics, in three phases (long term, medium term and short term). The National Curriculum details long term teaching objectives and our Mathematics Planning Overview highlights when these objectives are taught within the structure of the Academy curriculum for Mathematics. Our medium-term plans (based on the NCETM Maths Hub Teaching for Mastery materials) give details of the aspects of number, measurement, geometry and statistics covered in each term. These have been developed by the Mathematics Co-ordinator in liaison with each year group teaching team. These plans ensure an appropriate balance and distribution of work across each term.

Class teachers complete a weekly (short term) plan for the teaching of Mathematics. This lists the specific learning objectives and expected outcomes and gives details of how the lessons are to be taught. It also includes details of what each group of children will be learning and their differentiated challenges. There is a copy of this planning displayed on the classroom wall and one is filed in the planning file. We plan the activities in Mathematics so that they build on the children’s prior learning. While we give children of all abilities the opportunity to develop their skills, knowledge and understanding, we also ensure progression so that there is an increasing challenge for the children as they move up through the Academy.

**The Early Years Foundation Stage**

In the Foundation Stage, Mathematics skills are taught as an integral part of the Early Years Foundation Stage (EYFS) curriculum. Children are given the opportunity to develop and improve their skills in counting, understanding, and using numbers, calculating simple addition and subtraction problems, recalling addition and subtraction facts and investigate shapes, spaces, and measures. In the EYFS, the Mathematics curriculum is not covered in isolation from the other six areas of learning. We give all children the opportunity to encounter and use Mathematics in a widening range of situations.

In Reception children have a daily Mathematics lesson, however, opportunities to practise numeracy skills, for example, counting, comparing numbers, solving number or shape, space and measures related problems as part of play-based learning will be provided throughout the learning environment in both the classroom and outdoor area.

**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 (National Curriculum).

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

The programme of study for Mathematics, as detailed in the National Curriculum, is based on the following four areas of teaching and learning:

**Number:**

* Ensuring 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). Know the number bonds to 20 and be precise in using and understanding place value.

**Measurement:**

* Involving using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

**Geometry:**

* Developing the ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary.

**Statistics (Year 2):**

* Recording, interpreting, collating, organising and comparing information.

**Spoken Language**

The National Curriculum for 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. They must be assisted 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 (National Curriculum).

**Contribution of Mathematics to teaching in other curriculum areas**

The Mathematics, skills that children develop are linked to and applied in every area of our curriculum. The children’s skills in number, measurement, geometry and statistics enable them to communicate, solve problems and express their understanding in a variety of areas of work at school.

**Assessment**

Pupils are assessed on a day-to-day basis during each Mathematics lesson. These short-term assessments for learning inform the adjustment of immediate plans. Teachers match these short-term assessments closely to the learning objectives and practice is adapted accordingly. Formal summative assessments are carried out, tracked and monitored at least termly.

End of Key Stage assessments are carried out in accordance with legislation and results inform the Academy SEF, Academy Development Plan and Performance Management.

Parents are informed about their child’s progress in Mathematics at open evenings and in the annual report sent home at the end of the year.

The subject leader keeps evidence of curriculum coverage and examples of the children’s work in an evidence file which shows the expected level of achievement in Maths in each year of the Academy.

**Monitoring and Review**

The Mathematics curriculum will be monitored to ensure breadth, balance and relevance to individual pupils. This will be achieved by continual monitoring of pupils’ progress in a series of steps for success towards the National Curriculum Expectations for Year 1 and Year 2 or towards meeting expected levels of development against the Early Learning Goals for Mathematics.

The co-ordination and planning of the Mathematics curriculum are the responsibility of the subject leader who:

* Supports colleagues in their teaching, by keeping abreast of current developments in Mathematics and by providing a strategic lead and direction for this subject.
* Gives the Principal an annual update of the mathematics curriculum and its development in the context of the Academy Development Plan.
* Uses allocated management time to review evidence of children’s progress, and to observe and review Mathematics lessons across the school.

In addition, the Principal and Mathematics Co-ordinator monitor the medium and weekly planning and observe and review Mathematics lessons to ensure consistency of teaching and learning throughout the Academy.

The Senior Leadership Team meet regularly to discuss:

* The progress of the subject within the Academy.
* Performance analysis in relation to the Academy Development Plan.
* Outcomes in relation to development priorities and their impact upon teaching and learning.
* Future developments in accordance with the Academy Development Plan.

Governors are also invited to monitor the effectiveness of the Academy through a variety of other activities including learning walks and classroom observation.

Staff are continuously developing their Mathematics subject knowledge and the subject leader takes an active role in disseminating best practice, keeping staff informed of current developments in Mathematics and making recommendations for staff training.

This policy was reviewed in September 2021 and will be reviewed again in September 2022.

Signed: M.Benton

Principal