# Maths

## Edmund Waller Curriculum

Intent
Implementation
Impact

**Know, Explore, Communicate**

# Intent – Mission statement

*Edmund Waller mathematicians:*

- *have a deep understanding and profound confidence in maths*

- *relish complex problem solving and are curious explorers*

- *see the beauty in the mathematical patterns and structures that are all around us*

- *are resourceful, collaborative critical thinkers and connection makers*

*We provide a high-quality maths education that develops flexible and creative mathematicians who have a firm base in number fluency and strong subject knowledge that allows all learners to enjoy and succeed in mathematics.*

*Edmund Waller School Vision*

- **Humanity** - a culture of visible kindness where everyone is treated fairly and respectfully.

- **Creativity** - an environment where children have the skills to think creatively, take risks, explore the world and communicate their findings with others.

- **Ambition** - high expectations for all learners ensuring equitable access to the curriculum and other opportunities within school

# Intent – Vision

**We aim to create fluent, passionate and curious mathematicians through teaching a coherently sequenced, experience-based maths curriculum underpinned by dedicated, highly skilled teachers with expert subject knowledge. We want our pupils to acquire a deep, long-term, secure and adaptable understanding of maths; to achieve mastery that enables them to move on to more advanced material.**

Our Whole School Maths Vision is:

· for all children to become fluent in the fundamentals of mathematics so that they develop conceptual understanding along with the ability to rapidly recall and apply knowledge fluently and accurately.
· for problem solving to be at the heart of mathematics, having mathematicians who thrive on challenge and have the opportunity to apply their knowledge to a range of concepts.
· for all children to develop a range of strategies, selecting the most efficient for the context and being able to explain why this is.
· to develop all our children's confidence and resilience in mathematics through promoting fascination and excitement of the subject and having a classroom culture that celebrates and learns from mistakes.
· for all children to reason mathematically by following a line of enquiry, developing an argument and proof, conjecturing relationships, and organising their thoughts to provide clarity.
· to promote the importance of mathematics in everyday life with children learning through real life contexts and having maths exposed in a range of subject areas.
· to provide opportunities for pattern seeking and making connections between mathematical concepts.
· to have the CPA approach built-in to our lessons, using a range of models and manipulatives to develop both procedural fluency and conceptual understanding.
· for mathematical language to be rooted in our practice, ensuring opportunities to develop confidence in using this.

# Implementation

**Mastery curriculum & lessons**

At Edmund Waller we follow the NCETM Ready to progress curriculum structure – a research informed programme of study. Our aim is that all children achieve the year's targets in order to be ready to progress to the next year's curriculum, and as a result, we are focusing on moving slower through the curriculum, but at a greater depth and with a greater variety of application, so that our learners can apply what they have learned in multiple contexts.

# Implementation

**Whole class teaching – children are taught as a whole class for daily one hour lessons, as well as a daily 20 minute fluency session**

We believe our maths lessons should be full of talking and discussion, of sharing ideas. Our lessons are much more of a tennis rally with short tasks and then whole class discussions or teacher clarification of misconceptions, followed by more independent tasks, and finally coming back to the teacher to wrap up, confirm understanding, and to check if we can move on as a class, or if we need to revisit the same objective in a different way the next day.

**The structure is as follows:**

- **I do:** The teacher introduces the main mathematical concept and objective for the lesson, as well as key words and stem sentences that are rehearsed together

- **We do:** Together, the class explore, discuss and reason with each other using key vocabulary, concrete objects and pictorial representations to help them prove their points.

- **We do:** Come back as a class to share findings, check understanding and remodel new learning if necessary

- **You do:** learners practise the day's objective independently through solving a variety of problems

- **Plenary:** The teacher checks understanding, celebrates successes and assesses if the class is ready to move on, or if more time is needed on the day's objective.

# Implementation

Teachers plan and deliver inclusive lessons to address the needs of all pupils with the use of scaffolding, skilful questioning, rapid intervention and carefully designed enriching activities. The vast majority of pupils progress through the programmes of study at broadly the same pace. Pupils who grasp concepts rapidly are challenged by being offered rich and sophisticated problems before any acceleration to new content. Those who are not sufficiently fluent with earlier material consolidate their understanding, including through additional practice, before moving on. Teachers aim to rapidly address gaps in children's understanding within the lesson and through targeted intervention outside of the lesson.

**Subject Overview**

## Autumn

| Autumn | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 | Week 13 | Week 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y1 | Reception experiences & counting within 100 (7 weeks NPV) | | | | | | | Comparison of quantities and part–whole relationships (3 weeks | | | Numbers 0 to 5 (2 weeks NPV) | | Spare | Recognise, compose, |
| Y2 | Numbers 10 to 100 (4 weeks NPV) | | | | Calculations within 20 (3 weeks AS) | | | Fluently add & subtract | Addition & subtraction of 2 digit numbers (1) (2 | | Spare | Introduction to multiplication (7 weeks MD) | | |
| Y3 | Adding and subtracting across 10 | | Numbers to 1000 (4 weeks NPV) | | | | Numbers to 1000 (3 weeks AS) | | | Numbers to 1000 (3 weeks NF) | | | Spare | Spare |
| Y4 | Review of column addition and subtraction (3 weeks AS) | | | Numbers to 10,000 (5 weeks NPV & NF) | | | | | Perimeter (2 weeks G) | | Spare | Spare | 3,6,9 times tables (4 weeks NF) | |
| Y5 | Decimal fractions (5 weeks) Number & Place Value (NPV) | | | | | Money (2 weeks) | | Negative numbers (2 week) | | Short multiplication & short division (6 weeks) Multiply & divide (MD) | | | | |
| Y6 | Calculating using knowledge of structures (1) (3 weeks AS) | | | Calculating using knowledge of structures (1) (3 weeks MD) | | | Multiples of 1,000 (2 weeks) | | Numbers up to 10,000,000 (4 weeks NPV) | | | | Draw, compose and decompose shapes (2 weeks G) | |

## Spring

| Spring | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 | Week 13 | Week 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y1 | Recognise, compose, decompose and | | Numbers 0 to 10 (3 weeks) | | | Additive structures (4 weeks) | | | | Addition and subtraction facts within 10 (3 weeks) | | | | |
| Y2 | Introduction to multiplication cont. (7 weeks) | | | Introduction to division structures (2 weeks) | | Shape (2 weeks) | | Addition & subtraction of 2 digit numbers (2) (3 | | Spare | Spare | Spare | | |
| Y3 | Right angles (2 weeks G) | | Manipulating the additive relationship and securing mental (4 weeks AS) | | | | Column addition (2 weeks AS) | | 2, 4, 8 times tables (3 weeks NF/MD) | | | Column subtraction | | |
| Y4 | 3,6,9 times tables (4 weeks NF) | | 7 times table and patterns (2 weeks NF) | | Understanding and manipulating multiplicative relationships (5 weeks MD & NF) | | | | | Coordinates (2 weeks G) | | Spare | | |
| Y5 | Area & Scaling (5 weeks) Geometry (G) | | | | | Calculating with decimal fractions (3 weeks) | | | Factors, Multiples and Primes (4 weeks) Multiply & Divide (MD) | | | | | |
| Y6 | Multiplication and division (4 weeks MD) | | | | Area, perimeter, position and direction | | Fractions and percentages (6 weeks F) | | | | | | | |

## Summer

| Summer | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 | Week 13 | Week 14 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Y1 | Numbers 0 to 20 (4 weeks NPV) | | | | Unitising & coin recognition (5 weeks) | | | | | Position & direction (2 weeks G) | | Time | | Spare |
| Y2 | Money (1 week) | Fractions (2 weeks F) | | Time (1 week) | Position & direction (1 | Spare | Spare | Multiplication and division – doubling, halving, quotitive and | | Sense of measure – capacity, volume, | | Spare | | Spare |
| Y3 | Unit Fractions (6 weeks F) | | | | | | Non-unit fractions (5 weeks F) | | | | | Parallel and perpendicular sides in | | Time (1 week) |
| Y4 | Review of fractions ( | Fractions greater than 1 (6 weeks F) | | | | | | | Symmetry in 2D shapes (2 weeks G) | | Time (1 wee | Division with remainders (2 weeks | Spare | Spare |
| Y5 | Fractions Number & Place Value (NPV) | | | | | | | | | Converting units Number & Place Value | | Angles and transformations Geometry (G) | | |
| Y6 | Statistics (1 week) | KS2 SATS | | | | Ratio and proportion (2 weeks) | | Calculating using | Solving problems with two unknowns (2 | Order of operations | Mean average (1 | Spare | Spare | |

# Impact

**What are the outcomes of our curriculum for our learners?**

- The impact of our curriculum on our learners' development of mathematical skills and knowledge is measured formatively and summatively. Teachers check for understanding throughout each lesson, and will spend more time on, or revisit concepts in different contexts to ensure understanding is achieved by all pupils. End of unit assessments help inform teaching, and interventions (in the form of pre-teaching lesson objectives) are planned to support and enable the success of each child. Summative termly assessments feed in to pupil progress meetings with the maths lead and SLT to ensure that pupils are supported to make good progress across the school.

- These factors ensure that we are able to maintain high standards in mathematics. In the Early Years, a mixture of child-initiated and quality teacher-led learning enables the vast majority of pupils to progress seamlessly onto the National Curriculum by achieving their Early Learning Goals in mathematics. Upon completion of Year 6, our curriculum enables pupils to be fully prepared and equipped to successfully continue their mathematical learning journey at secondary school and in their later lives.

# Outcomes – at the end of Reception

| Counting |
|---|
| Count verbally beyond 5. |
| Count verbally beyond 10. |
| Count verbally beyond 20. |
| Accurately count items to 5 with one-to-one correspondence. |
| Accurately count items to 10 with one-to-one correspondence. |
| Correctly count sounds and actions, as well as objects. |
| Show a secure understanding of the 'cardinal principle' (knows the last number reached when counting tells you the total). |
| Subitise up to 3. |
| Subitise up to 5. |
| Show 'finger numbers' up to 5. |
| Link numeral to amounts up to 5. |
| Link numeral to amounts up to 10. |

| Comparison |
|---|
| Can use 'more than' and 'fewer than' to compare quantities. |
| Can compare quantities up to 10 and say whether one is greater than, less than or the same as the other. |
| Understand 'one more than/one less than'. |

| Composition of Number |
|---|
| Solve real-life maths problems with numbers up to 5. |
| Know the total of a larger set by subitising the groups within it and immediately combining them to find the total (conceptual subitising). |
| Demonstrate an understanding of the composition of numbers to 5. |
| Demonstrate an understanding of the composition of numbers to 10. |
| Automatically recall number bonds to 5. |
| Automatically recall some number bonds to 10. |
| Apply knowledge of number bonds to recall some subtraction facts to 5. |

| Shape and Space |
|---|
| Can talk about some common 2D shapes using informal and mathematical language. |
| Can talk about some common 3D shapes using informal and mathematical language. |
| Can select shapes appropriately for tasks. |
| Combine shapes to make new ones. |
| Understand that shapes can be decomposed into smaller ones within them. |
| Explore shapes and spatial awareness by rotating and manipulating shapes. |
| Understand positional language. |
| Use positional language. |
| Describe and discuss a route. |

| Patterns and Mathematical Relationships |
|---|
| Talk about patterns in the environment using informal language. |
| Continue a simple AB pattern. |
| Copy and create a simple AB pattern. |
| Notice and correct an error in a simple pattern. |
| Continue and copy a more complex pattern. E.g. ABC, ABB, ABBC |
| Create a more complex pattern. |
| Notice and correct an error in a more complex pattern. |
| Understand the odd and even pattern of numbers up to 10. |
| Explore how quantities can be distributed equally within numbers up to 10. |
| Explore the pattern of double facts to 10. |

| Measures |
|---|
| Make direct comparisons between objects relating to size. |
| Begin to use units to compare size. |
| Make direct comparisons between objects relating to length. |
| Begin to use units to compare length. |
| Make direct comparisons between objects relating to weight. |
| Begin to use units to compare weight. |
| Make direct comparisons between objects relating to capacity. |
| Begin to use units to compare capacity. |
| Can describe a sequence of events. |

# Outcomes – at the end of Year 1

| | Number and Place Value | Number Facts | Addition and Subtraction | Multiplication and Division | Fractions | Geometry |
|---|---|---|---|---|---|---|
| Y e a r 1 | 1NPV–1 Count within 100, forwards and backwards, starting with any number. | 1NF–1 Develop fluency in addition and subtraction facts within 10. | 1AS–1 Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers. | | | 1G–1 Recognise common 2D and 3D shapes presented in different orientations, and know that rectangles, triangles, cuboids and pyramids are not always similar to one another. |
| | 1NPV–2 Reason about the location of numbers to 20 within the linear number system, including comparing using < > and = | 1NF–2 Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers. | 1AS–2 Read, write and interpret equations containing addition (+), subtraction (-) and equals (=) symbols, and relate additive expressions and equations to real-life contexts. | | | 1G–2 Compose 2D and 3D shapes from smaller shapes to match an example, including manipulating shapes to place them in particular orientations. |

# Outcomes – at the end of Year 2

| | Number and Place Value | Number Facts | Addition and Subtraction | Multiplication and Division | Fractions | Geometry |
|---|---|---|---|---|---|---|
| **Y e a r 2** | 2NPV–1 Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and nonstandard partitioning. | 2NF–1 Secure fluency in addition and subtraction facts within 10, through continued practice. | 2AS–1 Add and subtract across 10. | 2MD–1 Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables. | | 2G–1 Use precise language to describe the properties of 2D and 3D shapes, and compare shapes by reasoning about similarities and differences in properties. |
| | 2NPV–2 Reason about the location of any twodigit number in the linear number system, including identifying the previous and next multiple of 10. | | 2AS–2 Recognise the subtraction structure of 'difference' and answer questions of the form, "How many more…?". | 2MD–2 Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotitive division). | | |
| | | | 2AS–3 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract only ones or only tens to/from a twodigit number. | | | |
| | | | 2AS–4 Add and subtract within 100 by applying related one-digit addition and subtraction facts: add and subtract any 2 twodigit numbers. | | | |

# Outcomes – at the end of Year 3

| | Number and Place Value | Number Facts | Addition and Subtraction | Multiplication and Division | Fractions | Geometry |
|---|---|---|---|---|---|---|
| **Year 3** | 3NPV–1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three-digit multiples of 10. | 3NF–1 Secure fluency in addition and subtraction facts that bridge 10, through continued practice. | 3AS–1 Calculate complements to 100. | 3MD–1 Apply known multiplication and division facts to solve contextual problems with different structures, including quotitive and partitive division. | 3F–1 Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts. | 3G–1 Recognise right angles as a property of shape or a description of a turn, and identify right angles in 2D shapes presented in different orientations. |
| | 3NPV–2 Recognise the place value of each digit in three-digit numbers, and compose and decompose three-digit numbers using standard and non-standard partitioning. | 3NF–2 Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number. | 3AS–2 Add and subtract up to three-digit numbers using columnar methods. | | 3F–2 Find unit fractions of quantities using known division facts (multiplication tables fluency). | 3G–2 Draw polygons by joining marked points, and identify parallel and perpendicular sides. |
| | 3NPV–3 Reason about the location of any three-digit number in the linear number system, including identifying the previous and next multiple of 100 and 10. | 3NF–3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10). | 3AS–3 Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction, and how both relate to the part–part–whole structure. Understand and use the commutative property of addition, and understand the related property for subtraction. | | 3F–3 Reason about the location of any fraction within 1 in the linear number system. | |
| | 3NPV–4 Divide 100 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 100 with 2, 4, 5 and 10 equal parts. | | | | 3F–4 Add and subtract fractions with the same denominator, within 1. | |

# Outcomes – at the end of Year 4

| | Number and Place Value | Number Facts | Addition and Subtraction | Multiplication and Division | Fractions | Geometry |
|---|---|---|---|---|---|---|
| **Y e a r 4** | 4NPV−1 Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100. | 4NF−1 Recall multiplication and division facts up to 12 × 12, and recognise products in multiplication tables as multiples of the corresponding number. | | 4MD−1 Multiply and divide whole numbers by 10 and 100 (keeping to whole number quotients); understand this as equivalent to making a number 10 or 100 times the size. | 4F−1 Reason about the location of mixed numbers in the linear number system. | 4G−1 Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant. |
| | 4NPV−2 Recognise the place value of each digit in four-digit numbers, and compose and decompose four-digit numbers using standard and non-standard partitioning. | 4NF−2 Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, and interpret remainders appropriately according to the context. | | 4MD−2 Manipulate multiplication and division equations, and understand and apply the commutative property of multiplication. | 4F−2 Convert mixed numbers to improper fractions and vice versa. | 4G−2 Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons. |
| | 4NPV−3 Reason about the location of any four-digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each. | 4NF−3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100). | | 4MD−3 Understand and apply the distributive property of multiplication. | 4F−3 Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers. | 4G−3 Identify line symmetry in 2D shapes presented in different orientations. Reflect shapes in a line of symmetry and complete a symmetric figure or pattern with respect to a specified line of symmetry. |
| | 4NPV−4 Divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with 2, 4, 5 and 10 equal parts. | | | | | |

# Outcomes – at the end of Year 5

| | Number and Place Value | Number Facts | Addition and Subtraction | Multiplication and Division | Fractions | Geometry |
|---|---|---|---|---|---|---|
| **Year 5** | 5NPV−1 Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01. | 5NF−1 Secure fluency in multiplication table facts, and corresponding division facts, through continued practice. | | 5MD−1 Multiply and divide numbers by 10 and 100; understand this as equivalent to making a number 10 or 100 times the size, or 1 tenth or 1 hundredth times the size. | 5F−1 Find non-unit fractions of quantities. | 5G−1 Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size. |
| | 5NPV−2 Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and non-standard partitioning. | 5NF−2 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth). | | 5MD−2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors. | 5F−2 Find equivalent fractions and understand that they have the same value and the same position in the linear number system. | 5G−2 Compare areas and calculate the area of rectangles (including squares) using standard units. |
| | 5NPV−3 Reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each. | | | 5MD−3 Multiply any whole number with up to 4 digits by any one-digit number using a formal written method. | 5F−3 Recall decimal fraction equivalents for 1/2, 1/4, 1/5 and 1/10, and for multiples of these proper fractions. | |
| | 5NPV−4 Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts. | | | 5MD−4 Divide a number with up to 4 digits by a one-digit number using a formal written method, and interpret remainders appropriately for the context. | | |
| | 5NPV−5 Convert between units of measure, including using common decimals and fractions. | | | | | |

# Outcomes – at the end of Year 6

| | Number and Place Value | Number Facts | Addition and Subtraction | Multiplication and Division | Fractions | Geometry |
|---|---|---|---|---|---|---|
| | 6NPV−1 Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000). | | 6AS/MD−1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number). | 6AS/MD−1 Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number). | 6F−1 Recognise when fractions can be simplified, and use common factors to simplify fractions. | 6G−1 Draw, compose, and decompose shapes according to given properties, including dimensions, angles and area, and solve related problems. |
| Year 6 | 6NPV−2 Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non-standard partitioning. | | 6AS/MD−2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding. | 6AS/MD−2 Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships, and place-value understanding. | 6F−2 Express fractions in a common denomination and use this to compare fractions that are similar in value. | |
| | 6NPV−3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts. | | 6AS/MD−3 Solve problems involving ratio relationships. | 6AS/MD−3 Solve problems involving ratio relationships. | 6F−3 Compare fractions with different denominators, including fractions greater than 1, using reasoning, and choose between reasoning and common denomination as a comparison strategy. | |
| | 6NPV−4 Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts. | | 6AS/MD−4 Solve problems with 2 unknowns. | 6AS/MD−4 Solve problems with 2 unknowns. | | |