



Ryton Federation Mathematics Curriculum

Year 4

Understanding and investigating with numbers

Place value, ordering and rounding (whole numbers)

- **Count forwards and back in steps of 10, 100 from any given number.**
- *Interpret negative numbers in context and **count backwards through zero to include negative numbers.***
- *Read, write, **order and compare numbers beyond 1000.***
- **Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones).**
- **Find 1000 more or less than a given number.**
- *Use the vocabulary of comparing and ordering numbers including use of $>$, $<$ symbols and $=$ sign.*
- **Identify, represent and estimate numbers using different representations** including measures.
- **Read Roman numerals to 100 (I to C) and know that, over time, the numeral system changed to include the concept of zero and place value.** *Appreciate the difference between the Roman numeral system and our own number system from a place value viewpoint.*
- **Round any number to the nearest 10, 100 or 1000.**
- *Connect estimation and rounding of numbers to the use of measuring instruments.*
- *Apply understanding of the number system to **solve number and practical problems** and puzzles involving **increasingly large positive numbers**, money or measures. Explain methods and reasoning orally and in writing, including using diagrams and symbols.*

Properties of numbers and number sequences

- *Continue to **count in** and **Recognise known multiples**, extend to **multiples of 6, 7, 9, 25 and 1000.***
- *Recognise patterns in sequences of multiples and connections between them e.g. explore patterns on a 12 x 12 multiplication grid.*
- *Use the vocabulary of factors and multiples and look for common factors and multiples to support work with fractions.*
- *Recognise and extend number sequences formed by counting from any number in steps of constant size, extending beyond zero when counting back.*
- *Apply understanding of number properties to solve routine and non-routine problems and puzzles involving numbers, money or measure.*
- *Explore and discuss patterns, properties and relationships that arise in the number system using appropriate mathematical vocabulary.*

- *Develop lines of enquiry through conjecturing relationships and generalizations and testing ideas. Identify examples for which a statement is true or false.*

Fractions and decimals

- Make connections between fractions of a length, of a shape and as a representation of one whole or set of quantities.
- **Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non unit fractions where the answer is a whole number.**
- Understand the relation between non-unit fractions and multiplication and division, with particular emphasis on tenths and hundredths.
- *Compare and order fractions.*
- **Recognise and show, using diagrams, families of common equivalent fractions.**
- Use factors and multiples to recognise equivalent fractions and simplify where appropriate e.g. $\frac{6}{9} = \frac{2}{3}$ or $\frac{1}{4} = \frac{2}{8}$.
- **Add and subtract fractions with the same denominator** practising through increasingly complex problems beyond one whole.
- Extend understanding of the number system and decimal place value to tenths and hundredths and relate this to decimal measure.
- Understand decimals and fractions are different ways of expressing numbers and proportions.
- Extend use of the number line to connect fractions, numbers and measures.
- Count forwards and back using simple fractions and decimals.
- **Count up and down in tenths and hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.**
- **Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$.**
- **Recognise and write decimal equivalents of any number of tenths or hundredths.**
- **Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths.**
- **Round decimals with one decimal place to the nearest whole number.**
- **Compare and order numbers and quantities with the same number of decimal places up to two decimal places** and represent them in several ways, such as on number lines.
- **Solve simple measure and money problems involving fractions and decimals to two decimal places.**
- *Apply understanding of fractions and decimals to solve routine and non-routine problems and puzzles involving numbers, shapes, money or measures. Explain methods and reasoning orally and in writing, including using diagrams and symbols.*

Developing and applying calculation

Addition and subtraction

- *Continue to practice using known facts and understanding of place value to quickly derive sums and differences using whole numbers and decimals.*
- *Continue to practice mental methods with increasingly large numbers e.g. Use place value and known facts to add or subtract one near multiple of 100 from another e.g. $602 - 498$ or $535 + 399$.*
- *Use and explain a range of mental strategies appropriate to the numbers involved, sometimes supporting explanations with jottings or informal recording.*
- **Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.**
- **Add and subtract fractions with the same denominator** practising through increasingly complex problems beyond one whole.
- **Estimate and use inverse operations to check answers to a calculation.**
- *Understand and use the relationships between the four operations and the principles of the arithmetic laws; commutative, associative and distributive.*
- **Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.**
- *Solve calculation problems including using information from a range of tables and charts.*
- *Apply understanding of number operations to solve number puzzles and non-routine problems and explain reasoning.*
- *Use and explain the equals sign to indicate equivalence, including in missing number problems (e.g. $13 + 24 = 12 + 25$; $33 = 55 - \Delta$).*

Multiplication and division

- **Recall multiplication and division facts for multiplication tables up to 12×12 .**
- *Relate multiplication and division to arrays and explore partitioning arrays in different ways to show relationships between number facts.*
- **Use place value, known and derived facts to multiply and divide mentally** (e.g. $600 \div 3 = 200$ can be derived from $2 \times 3 = 6$), **including multiplying by 0 and 1; dividing by 1; multiplying together three numbers.**
- **Recognise and use factor pairs and commutativity in mental calculations.**
- **Multiply two-digit and three-digit numbers by a one-digit number using formal written layout** of short multiplication.
- *Use the formal written method of short division for calculations involving two and three digit numbers divided by a single digit with exact answers.*
- *Understand and use the relationships between the four operations and the principles of the arithmetic laws; commutative, associative and distributive.*
- *Write statements about the equality of expressions e.g. using the distributive law $39 \times 7 = 30 \times 7 + 9 \times 7$ and the associative law $(2 \times 3) \times 4 = 2 \times (3 \times 4)$. Combine knowledge of number facts and rules of arithmetic to solve mental and written calculations e.g. $2 \times 6 \times 5 = 10 \times 6 = 60$.*
- **Solve one and two step problems in contexts involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects** e.g. the number of choices on a menu or three cakes shared equally between 10 children.

- *Use rounding, estimation and inverse operations to check answers to calculations and determine, in the context of a problem, levels of accuracy.*
- *Solve calculation problems using information from a range of tables and charts.*
- *Apply understanding of number operations to solve number puzzles, routine and non – routine problems and explain reasoning.*
- *Use and explain the equals sign to indicate equivalence, including in missing number problems (e.g. $2 \times 24 = 12 \times 4$; $33 = 5 \times \Diamond$).*

Measurement

- *Continue to use read and write standard metric units and their abbreviations, developing fluency in their relationships.*
- *Suggest suitable units and equipment for measuring and read scales to an appropriate degree of accuracy.*
- **Estimate, compare, order and calculate different measures, including money in pounds and pence** building on understanding of place value, decimal notation and knowledge of fractions.
- **Convert between units of measure e.g. kilometre to metre; hour to minute** using multiplication.
- **Measure and calculate the perimeter of a rectilinear figure, including squares, in centimetres and metres.**
- *Express perimeter algebraically as $2(a + b)$ where a and b are dimensions in the same unit.*
- **Find the area of rectilinear shapes by counting squares.**
- *Relate area to arrays and multiplication.*
- *Continue to develop accuracy with telling the time and using the vocabulary of time. Compare durations of events including when expressed in different units e.g. 3.5 hours and 140 minutes.*
- **Read, write and convert time between analogue and digital 12- and 24-hour clocks**
- **solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.**
- *Use all four operations to solve problems including scaling problems involving measure (e.g. length, mass, volume, money) and using decimal notation where appropriate . Information required to solve a problem is often drawn from tables, including timetables, graphs and charts.*
- *Apply measuring skills to an appropriate degree of accuracy, alongside the skills of thinking mathematically to solve problems. These should include practical problems and might involve construction of shapes or artefacts, often in a cross curricular context.*
- *Make and explain connections between number, measures and shape*

Geometry

Properties of shapes

- *Continue to develop use of correct mathematical vocabulary (including parallel and perpendicular) to identify and describe 2-D and 3-D shapes.*

- *Continue to draw and make 2-D and 3-D shapes using a range of materials.*
- **Compare and classify geometric shapes, including quadrilaterals** e.g. parallelogram, rhombus, trapezium **and triangles** e.g. isosceles, equilateral, scalene, **based on their properties and sizes.**
- Compare lengths and angles to decide if a polygon is regular or irregular.
- **Identify acute and obtuse angles and compare and order angles up to two right angles by size** in preparation for using a protractor.
- **Identify lines of symmetry in 2-D shapes presented in different orientations.**
- **Complete a simple symmetric figure with respect to a specific line of symmetry.**
- Draw symmetric patterns using a variety of media to become familiar with different orientations of lines symmetry; and recognise line symmetry in a variety of diagrams including where the line of symmetry does not dissect the original shape.
- *Solve problems, involving reasoning about shapes and their properties. Explain solutions orally or using writing, diagrams, practical materials or dynamic geometry ICT tools*

Position and direction

- Draw a pair of axes in one quadrant, with equal scales and integer labels.
- Read, write and use pairs of coordinates to **describe positions on a 2-D grid as coordinates in the first quadrant.**
- Use co-ordinate plotting ICT tools.
- **Describe movements between positions as translations of a given unit to the left/right and up/down.**
- **Plot specified points and draw sides to complete given polygon.**
- *Recognise and use the 8 compass directions.*
- *Solve problems, involving reasoning about shapes and their properties. Explain solutions orally or using writing, diagrams, practical materials or dynamic geometry ICT tools*

Statistics

Interpreting, constructing and presenting data

- **Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs**
- Begin to relate the graphical representation of data to recording change over time.
- Understand and use a greater range of scales in representations.
- **Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.**
- *Pose questions that can be answered using information presented in different graphs charts and tables.*
- *Understand and use Venn and Carroll diagrams to support reasoning about numbers or shapes.*
- *Apply the skills of collecting, representing and interpreting statistical data across the curriculum within and beyond mathematic, sometimes in response to an enquiry of interest to and suggested by pupils.*