



## **Ryton Federation Mathematics Curriculum**

### **Year 3**

## **Understanding and investigating with numbers**

### **Place value, ordering and rounding**

- Continue to count in ones, tens and hundreds *from any number*, using a variety of representations, including those related to measures, to become fluent in the order and place value of numbers to 1000.
- **Read and write numbers up to 1000 in numerals and words.**
- **Compare and order numbers up to 1000.**
- *Use the vocabulary of comparing and ordering numbers including use of  $>$ ,  $<$  symbols and  $=$  sign.*
- **Identify, represent and estimate numbers using different representations.**
- **Recognise the place value of each digit in a three-digit number (hundreds, tens and ones).**
- Apply partitioning related to place value using varied and increasingly complex problems e.g.  $146 = 100 + 40 + 6$  and  $146 = 130 + 16$ .
- *Understand e.g. 146 as  $100 + 40 + 6$  and as 1 hundred, 4 tens and 6 ones.*
- *Round any number to nearest 10 or 100.*
- *Apply understanding of the number system to **solve number and practical problems** and puzzles involving numbers, money or measures. Explain methods and reasoning orally and in writing, including using diagrams and symbol.*

### **Properties of numbers and number sequences**

- Continue to use multiples of 2, 3, 5 and 10.
- **Count from 0 in multiples of 4, 8, 50 and 100.**
- **Find 10 or 100 more or less than a given number.**
- *Recognise patterns in sequences of multiples and connections between them e.g. explore patterns on a  $12 \times 12$  multiplication grid.*
- *Recognise and extend number sequences formed by counting from any number in steps of constant size.*
- *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

- Continue to recognise fractions in the context of parts of a whole, numbers, measurements, a shape, and unit fractions as a division of a quantity.
- **Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.**
- Understand the relation between unit fractions as operators (fractions of), and division by integers.
- **Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators.** Use them on a number line and deduce relations between them such as size and equivalence. Go beyond the 0 – 1 interval, including relating this to measure.
- **Compare and order unit fractions, and fractions with the same denominators.**
- **Recognise and show, using diagrams, equivalent fractions with small denominators.**
- **Add and subtract fractions with the same denominator within one whole e.g.  $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$ .**
- **Count up and down in fractions including tenths.**
- **Recognise that tenths arise from dividing an object into ten equal parts and in dividing one-digit numbers or quantities by 10,** connecting them to place value, decimal measures and division by 10.
- *Apply understanding of fractions 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 recall of addition and subtraction facts to 20; use these known facts and understanding of place value to quickly derive sums and differences using two-digit numbers.*
- **Add and subtract numbers mentally including**
  - **a three-digit number and ones**
  - **a three-digit number and tens**
  - **a three-digit number and hundreds**
  - addition and subtraction of two digit numbers including additions with answers exceeding 100.
- *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 three digits, using formal written methods of columnar addition and subtraction.**
- **Estimate the answer to a calculation and use inverse operations to check answers.**
- *Understand and use the principles of the arithmetic laws; commutative and associative.*

- **Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.**
- *Use and explain the equals sign to indicate equivalence, including in missing number problems (e.g.  $6 + 8 = 7 + 7$ ;  $33 = 38 - \Delta$ ).*
- *Solve calculation problems 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.*

## Multiplication and division

- **Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.** Continue to practice 2, 5 and 10 tables and connect the 2, 4 and 8 multiplication tables through doubling.
- Develop efficient mental methods for example using commutativity and associativity e.g.  $4 \times 12 \times 5 = 20 \times 12 = 240$  and multiplication and division facts e.g. using  $3 \times 2 = 6$ ,  $6 \div 3 = 2$  and  $2 = 6 \div 3 = 2$  to derive related facts such as  $30 \times 2 = 60$ ,  $60 \div 3 = 20$  and  $20 = 60 \div 3$ .
- **Write and calculate mathematical statements for multiplication and division using the multiplication tables that are known, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.**
- *Use informal recording methods such as the grid method, linked to understanding of partitioning arrays to support the development of formal methods as appropriate.*
- **Solve problems, including missing number problems, involving multiplications and division, including measuring contexts and positive integer scaling problems (e.g. four times as high, 8 times as long) and correspondence problems in which n objects are connected to m objects (e.g. 3 hats and 4 coats, how many different outfits, 4 cakes shared equally between 8 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.  $2 \times 12 = 4 \times 6$ ;  $30 = 5 \times \Diamond$ ).*

## Measurement

- Continue to measure using appropriate tools and units.
- **Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g): volume/capacity (l/ml), including**
  - comparing and using mixed units e.g. 1kg and 200g
  - simple equivalents of mixed units e.g. 5m = 500cm.
  - comparisons involving simple scaling by integers e.g. a given quantity is twice as long or 5 times as high. This should be connected to multiplication.
- **Measure the perimeter of simple 2-D shapes.**
- Continue to become fluent in recognising the value of coins; **add and subtract amounts of money to give change, using both £ and p in practical contexts.** Record £ and p separately.
- **Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and the 12-hour and 24-hour clocks.** Use the digital 12 hour clock.

- **Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight.**
- **Know the number of seconds in a minute and the number of days in each month, a year and leap year.**
- **Compare duration of events e.g. the time taken by a particular event or task**
- *Use all four operations to solve problems including scaling problems involving measure (e.g. length, mass, volume, money). 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 describe, identify, compare and sort 2-D and 3-D shape. Descriptions include length of lines and acute and obtuse angles.*
- *Extend knowledge of the properties of shapes to symmetrical and non-symmetrical polygons and polyhedra.*
- **Draw 2-D shapes and make 3-D shapes using modelling materials** (connect decimals and rounding to drawing and measuring straight lines in centimetres in a variety of contexts); **recognise 3-D shapes in different orientations and describe them.**
- **Recognise angles as a property of shape or a description of turn.**
- **Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater or less than a right angle** and use the language of acute and obtuse.
- **Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.**
- *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

- *Continue to use mathematical language to describe position, direction and movement including movement in a straight line and quarter, half, three quarter and full turns both clockwise and anti-clockwise.*
- *Recognise and use the four compass directions N, E, S, W.*

## Statistics

### Interpreting, constructing and presenting data

- **Interpret and present data using bar charts, pictograms and tables** in different contexts
- Understand and use simple scales e.g. 2, 5, 10 units per cm in pictograms and bar charts with increasing accuracy.
- **Solve one and two-step questions e.g. ‘How many more?’ and ‘How many fewer?’ using information presented in scaled bar charts and pictograms and tables.**
- *Pose their own questions that can be answered using information presented in different bar charts pictograms 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 mathematics, sometimes in response to an enquiry of interest to and suggested by pupils.*