Curriculum Map: **Math** **Year 6**

Below outlines the learning focus for each term

Year 6 Programme of Study – by the end of the academic year:

Number – number and place value

- read, write, order and compare numbers to at least 10, 000 000 and determine the value of each digit
- round any whole number to a required degree of accuracy
- use negative numbers in context, and calculate intervals across zero
- solve number and practical problems that involve all of the above.

Number – addition and subtraction, multiplication and division

- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context
- perform mental calculations, including with mixed operations and large numbers
- identify common factors, common multiples and prime numbers
- use their knowledge of the order of operations to carry out calculations involving the four operations
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

Number – fractions - including decimals and percentages

- use common factors to simplify fractions; use common multiples to express fractions in the same denomination
- compare and order fractions, including fractions > 1
- add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
- multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, ¼ X ½ = 1/8]
- divide proper fractions by whole numbers [for example, 1/3 divided by 2 = 1/6]
- associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8]
- identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places
- multiply one-digit numbers with up to two decimal places by whole numbers
- use written division methods in cases where the answer has up to two decimal places
- solve problems which require answers to be rounded to specified degrees of accuracy
- recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

Ratio and proportion

- solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
- solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
- solve problems involving similar shapes where the scale factor is known or can be found
- solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

Algebra

- use simple formulae
- generate and describe linear number sequences
- express missing number problems algebraically
- find pairs of numbers that satisfy an equation with two unknowns
- enumerate possibilities of combinations of two variables

Measurement

- solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
- use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places
- convert between miles and kilometres
- recognise that shapes with the same areas can have different perimeters and vice versa
- recognise when it is possible to use formulae for area and volume of shapes
- calculate the area of parallelograms and triangles
- calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3].

Geometry – properties of shapes

- draw 2-D shapes using given dimensions and angles
- recognise, describe and build simple 3-D shapes, including making nets
- compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
- illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
- recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

Geometry – position and direction

- describe positions on the full coordinate grid (all four quadrants)
- draw and translate simple shapes on the coordinate plane, and reflect them in the axes.

Statistics

- interpret and construct pie charts and line graphs and use these to solve problems
- calculate and interpret the mean as an average.

Term	Learning Focus	
	Knowledge	**Skills**
	Number : Place Value • Read, write, order and compare numbers to at least 10,000,000 and determine the value of each digit • Solve number problems and practical problems • Round any whole number to a required degree of accuracy • Use negative numbers in context, and calculate intervals across zero	

Autumn Term	**Number : Addition and Subtraction Multiplication and division** • Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • Problem solving – using written methods of addition and subtraction • Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication • Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context • Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context • Identify common factors, common multiples and prime numbers ➢ Common factors ➢ Common multiples ➢ Recognising prime numbers up to 100 • Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) • Use their knowledge of the order of operations to carry out calculations involving the four operations • Perform mental calculations, including with mixed operations and large numbers • Use their knowledge of the order of operations to carry out calculations involving the four operations **Number – fractions - including decimals and percentages** • Use common factors to simplify fractions; use common multiples to express fractions in the same denomination • Compare and order fractions, including fractions > 1 • Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions • Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • Multiply simple pairs of proper fractions, writing the answer in its simplest form (for example, ¼ x ½ = 1/8] • Divide proper fractions by whole numbers (for example, 1/3 divided by 2 = 1/6) • Use written division methods in cases where the answer has up to two decimal places **Geometry – position and direction** • Describe positions on the full coordinate grid (all four quadrants) • Draw and translate simple shapes on the coordinate plane, and reflect them in the axes
	Number – number fractions- including decimals and percentages • Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places • Associate a fraction with division and calculate decimal fraction equivalents [for example, 0375] for a simple, fraction [for example, 3/8] • Multiply one-digit numbers with up to two decimal places by whole numbers • Use written division methods in cases where the answer has up to two decimal places • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts ➢ Percentage of ➢ Finding missing values ➢ Converting fractions to percentages ➢ Equivalent fractions, decimals and percentages • Compare and order fractions, including fractions > 1

Spring Term	• Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts **Algebra** • Generate and describe linear number sequences • Express missing number problems algebraically • Use simple formulae • Solving equations • Find pairs of numbers that satisfy an equation with two unknowns • Enumerate possibilities of combinations of two variables **Measurement** • Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal, notation to up to three decimal places • Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate • Convert between miles and kilometres **Measurement – perimeter, area & volume** • Recognise that shapes with the same areas can have different perimeters and vice versa • Recognise when it is possible to use formulae for area and volume of shapes • Calculate the area of parallelograms and triangles • Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units [for example, mm3 and km3] **Ratio and proportion** • Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples • Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • Solve problems involving similar shapes where the scale factor is known or can be found • Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
	Number : Addition and Subtraction Multiplication and division • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy • Solve addition and subtraction multistep problems in contexts, deciding which operations and methods to use and why • Solve problems involving addition, subtraction, multiplication and division **Number – fractions / decimals** • Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts **Ratio and proportion** • Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples

Summer Term	**Measurement – converting units** • Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places **Geometry – properties of shapes** • Draw 2-D shapes using given dimensions and angles • Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons • Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles • Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • Recognise, describe and build simple 3-D shapes, including making nets **Geometry – position direction** • Describe positions on the full coordinate grid (all four quadrants) **Statistics** • Calculate and interpret the mean as an average • Interpret and construct pie charts and line graphs and use these to solve problems ➢ Introducing pie charts ➢ Reading and interpreting pie charts ➢ Fractions and pie charts ➢ Percentages and pie charts ➢ Interpreting line graphs ➢ Constructing line graphs

Intent

The intent of our mathematics curriculum is to provide children with a foundation for understanding number, reasoning, thinking logically and problem solving with resilience so that they are fully prepared for the future.

We are committed to ensuring that children are able to recognise the importance of Maths in the wider world and that they are also able to use their mathematical skills and knowledge confidently in their lives in a range of different contexts. We want all children to enjoy Mathematics, develop their curiosity about the subject, and to experience success in the subject.

Implementation

The majority of pupils will move through the programmes of study at broadly the same pace.... Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on

- Teachers reinforce an expectation that all pupils are capable of achieving high standards in mathematics.
- Pupils are taught through whole-class teaching, where the focus is on all pupils working together on the same lesson content at the same time.

- Differentiation is achieved by emphasising deep knowledge and/or through individual support and intervention.
- If a pupil fails to grasp a concept or procedure, this is identified within the lesson structure and timely intervention ensures the pupil is best placed to move forward.
- Key facts such as multiplication tables and addition facts within 10 are retained through retrieval practice to develop automaticity; this avoids cognitive overload in the working memory and enables pupils to focus on new concepts.

Impact

Children demonstrate quick recall of facts and procedures. This includes:

- The recollection of the times tables.
- The flexibility and fluidity to move between different contexts and representations of mathematics.
- The ability to recognise relationships and make connections in mathematics.
- Children show confidence in Believing that they will achieve.
- Children show a high level of pride in the presentation and understanding of the work

Ongoing formative assessment enabling teachers to be responsive to our children's needs. Furthermore, our lesson design structure is shaped in a way that ensures misconceptions are identified during the lesson and immediately addressed at the point of learning.

Termly teacher assessment, alongside standardised tests, are used to help identify any gaps there may be in a pupils understanding