Curriculum Map: **Math**   **Year 5**

Below outlines the learning focus for each term

Year 5 Programme of Study – by the end of the academic year:

Number – number and place value

- read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit
- count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
- interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
- round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000
- solve number problems and practical problems that involve all of the above
- read Roman numerals to 1000 (M) and recognise years written in Roman numerals

Number – addition and subtraction

- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- add and subtract numbers mentally with increasingly large numbers
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

Number – multiplication and division

- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- establish whether a number up to 100 is prime and recall prime numbers up to 19
- multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- multiply and divide numbers mentally drawing upon known facts
- divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)
- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Number – fractions - including decimals and percentages

- compare and order fractions whose denominators are all multiples of the same number
- identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
- recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, 2/5 + 4/5 = 6/5 = 1 & 1/5]
- add and subtract fractions with the same denominator and denominators that are multiples of the same number
- multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
- read and write decimal numbers as fractions [for example, 0.71 = 71 / 100]
- recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
- round decimals with two decimal places to the nearest whole number and to one decimal place
- read, write, order and compare numbers with up to three decimal places
- solve problems involving number up to three decimal places

- recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal
- solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5, and those fractions with a denominator of a multiple of 10 or 25.

Measurement
- convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)
- understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
- measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
- calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes
- estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water]
- solve problems involving converting between units of time
- use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

Geometry – properties of shapes
- identify 3-D shapes, including cubes and other cuboids, from 2-D representations
- know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- draw given angles, and measure them in degrees (o)
- identify:
  ➢ angles at a point and one whole turn (total 360o)
  ➢ angles at a point on a straight line and 1/2 a turn (total 180o)
  ➢ other multiples of 90o
- use the properties of rectangles to deduce related facts and find missing lengths and angles
- distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

Geometry – position and direction
➢ identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.

Statistics
- solve comparison, sum and difference problems using information presented in a line graph
- complete, read and interpret information in tables, including timetables.

Term	Learning Focus	
	Knowledge	**Skills**

Autumn	**Number : Place Value**
	 • Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit
	   ➢ Numbers to 10,000
	   ➢ Rounding to the nearest 10, 100 and 1,000
	   ➢ Place value -100,000, 10,000s, 1,000s, 100s, 10s and 1s
	   ➢ The number line to 1,000,000
	   ➢ Comparing and ordering numbers to 1,000,000
	 • Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000
	 • Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000
	 • Read roman numerals to 1,000 (m) and recognise years written in roman numerals
	 • Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero
	 • Solve number problems and practical problems that involve all of the above	

Term	

	Number : Addition and Subtraction
	- Add and subtract whole numbers with more than 4 digits, including using formal written methods (column addition and subtraction)
	    ➢ Adding whole numbers with more than 4 digits
	    ➢ Subtracting whole numbers with more than 4 digits
	- Use rounding to check,answers to calculations and determine, in the context of a problem, levels of accuracy
	- Add and subtract numbers mentally with increasingly large numbers
	- Estimate and use inverse operations to check answers to a calculation
	- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
	
	Multiplication and division
	- Identify multiples and, factors, including finding all factor pairs of a number, and common factors of two numbers
	- Know and use the vocabulary of prime numbers, prime factors and composite (nonprime) numbers
	- Establish whether a number up to 100 is prime and recall prime numbers up to 19
	- Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
	- Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)
	- Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates
	- Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000
	
	Measurement – area & perimeter
	- Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres
	- Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes
	
	Statistics
	- Complete, read and interpret information in tables, including timetables
	- Solve comparison, sum and difference problems using information presented in a line graph
	    ➢ Interpreting line graphs
	    ➢ Drawing line graphs

	Multiplication and division
	- Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
	    ➢ Multiplying numbers up to 4 digits by a 1-digit number
	    ➢ Multiplying 2-digit numbers
	    ➢ Multiplying a 3-digit number by a 2-digit number
	    ➢ Multiplying a 4-digit number by a 2-digit number
	- Multiply and divide numbers mentally drawing upon known facts
	- Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context
	    ➢ Dividing up to a 4-digit number by a 1-digit number
	    ➢ Division with remainders
	    ➢ Problem solving – division with remainders

Spring Term	**Number – number fractions- including decimals and percentages**
	• Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths
	• Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example,
	• 2/5 + 4/5 = 6/5 = 1 & 1/5]
	• Compare and order fractions whose denominators are all multiples of the same number
	• Add and subtract fractions with the same denominator and denominators that are multiples of the same number
	• Problem solving – mixed word problems
	• Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams
	    ➢ Multiplying fractions
	    ➢ Calculating fractions of amounts
	    ➢ Using fractions as operators
	    ➢ Problem solving – mixed word problems
	• Read, write, order and compare numbers with up to three decimal places
	• Read and write decimal numbers as fractions [for example, = 71/100]
	• Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents
	• Round decimals with two decimal places to the nearest whole number and to one decimal place
	• Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal
	• Solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5, 4/5 and those fractions with a denominator of a multiple of 10 or 25

Summer Term	**Number – fractions / decimals**
	• Solve problems involving number up to three decimal places
	    ➢ Adding and subtracting decimals
	• Read, write, order and compare numbers with up to three decimal places
	• Solve problems involving number up to three decimal places
	• Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalent
	    ➢ Multiplying decimals by 10, 100 and 1,000
	    ➢ Dividing decimals by 10, 100 and 1,000
	Measurement – converting units
	• Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)
	• Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling
	• Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints
	• Solve problems involving converting between units of time
	• Estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water]
	    ➢ What is volume?
	    ➢ Comparing volumes
	    ➢ Estimation volume
	    ➢ Estimating capacity
	Geometry – properties of shapes
	• Identify:
	    ➢ angles at a point and one whole turn (total 360°)

- angles at a point on a straight line and <stacked fraction> 1 2 a turn (total 180°)
- other multiples of 90°
- measuring with a protractor

- Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- Draw given angles, and measure them in degrees (°)
- Use the properties of rectangles to deduce related facts and find missing lengths and angles
- Recognising and drawing parallel lines
- Reasoning about parallel and perpendicular lines
- Draw given angles, and measure them in degrees (o)
- Distinguish between regular and irregular polygons based on reasoning about equal sides and angles
- Identify 3D shapes, including cubes and other cuboids, from 2D representations

Geometry – position * direction
- Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed
  - Reflection
  - Reflection with coordinates
  - Translation
  - Translation with coordinates

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