

# Mathematics

## National Curriculum Aims and Objectives:

The national curriculum for maths aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

## Vision for Subject at Queenborough School:

A high-quality mathematics education will help pupils gain a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

## Year 5

### Terms 1 & 2

#### Oral and Mental calculation

- Read numbers to 100 000 in numerals and words
- Write numbers to 100 000 in numerals and words
- Order and compare whole numbers up to 1 000 000, negative numbers and decimals with up to one decimal places on a number line.
- Record using < or >
- Know what each digit represents in numbers to 100 0000
- Read and write decimal numbers to one place and know what each number represents.
- Count on or back in steps of 0.01, 0.1, 1, 10, 100 or 1000 from any number including decimals
- Count on and back in fractions
- Know by heart facts for all multiplication tables up to  $12 \times 12$
- *Use facts to  $12 \times 12$  and partitioning to multiply larger numbers or divide numbers larger than 144 mentally or supported by jottings.*
- Add and subtract numbers mentally including decimals to one decimal place *with jottings.*
- *Use partitioning to double or halve any number, including decimals to one decimal place.*
- Derive related facts from known facts (e.g.  $6 \times 0.2$  linked to  $6 \times 2$  or  $1 + 9 = 10$  linked to  $0.1 + 0.9 = 1$ )
- Multiply and divide whole numbers and decimals with up to one decimal place mentally by 10 or 100-*link to scaling up or down,*
- Round whole numbers to the nearest 10, 100 or 1000-*link to number line*
- Round a number with up to one decimal places to the nearest whole number-*link to number line.*
- Link scales on measuring tools or graphs to number lines and read scales

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| <p><b>Week 1</b></p> | <p>Number and place value to solve problems</p> <ul style="list-style-type: none"> <li>• <i>Identify the value of each digit to two decimal places- using images or manipulatives in a five digit number.</i></li> <li>• <i>Read and write numbers with two decimal places supported by images or manipulatives.</i></li> <li>• <i>Compare and order numbers with two decimal places on an empty number line -supported by images or manipulatives.</i></li> <li>• <i>Partition numbers into ones, tenths and hundredths (for example, <math>6.41 = 6 + 0.4 + 0.01</math> supported by practical resources)</i></li> <li>• <i>Round decimals with two decimal places to the nearest whole number and to one decimal place using a number line.</i></li> <li>• <i>Solve problems involving numbers with up to two decimal places.</i></li> </ul> |
| <p><b>Week 2</b></p> | <p>Addition and subtraction to solve problems</p> <ul style="list-style-type: none"> <li>• <i>Estimate answers</i></li> <li>• <i>Consider the most appropriate strategy to solve a calculation: calculate mentally, use a jotting or a written method</i></li> <li>• <i>Revise addition of whole numbers with 4 digits and decimals with one decimal place, including using a compact written method</i></li> <li>• <i>Revise subtraction whole numbers with 4 digits and decimals with one decimal place including using a compact written method</i></li> <li>• <i>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</i></li> </ul>   |
| <p><b>Week 3</b></p> | <p>Measures -Money to solve problems</p> <ul style="list-style-type: none"> <li>• <i>Estimate answers</i></li> <li>• <i>Consider the most appropriate strategy to solve a calculation: calculate mentally, use a jotting or a written method</i></li> <li>• <i>Add amounts of money including using a compact written method</i></li> <li>• <i>Subtract amounts of money including using a compact written method</i></li> <li>• <i>Calculate change including from £10, £20 or £50.</i></li> <li>• <i>Solve addition and subtraction multi-step problems in the context of money deciding which operations and methods to use and why.</i></li> </ul>  |
| <p><b>Week 4</b></p> | <p>Multiplication and division-factors and primes - to solve problems</p> <ul style="list-style-type: none"> <li>• <i>Know how to find the factors of a number using tables knowledge and arrays</i></li> <li>• <i>Know how to find all the factor pairs of a number</i></li> <li>• <i>Know how to find common factors of two numbers</i></li> <li>• <i>Know how to find prime numbers up to 100-link to square numbers</i></li> <li>• <i>Know and use the vocabulary of prime numbers</i></li> <li>• <i>Record square numbers using (<sup>2</sup>) for squared.</i></li> <li>• <i>Solve problems involving using and applying the knowledge of factors, multiples, square numbers and cube numbers.</i></li> </ul>   |
| <p><b>Week 5</b></p> | <p>Fractions to solve problems</p> <ul style="list-style-type: none"> <li>• <i>Read and write decimal numbers as fractions and vice versa</i></li> <li>• <i>Identify, name and write equivalent fractions of a given fraction, use manipulatives and diagrams represented visually -link to factors and multiples</i></li> <li>• <i>Identify, name and write equivalent fractions of a number of tenths or hundredths -use manipulatives or diagrams ,</i></li> <li>• <i>Compare and order fractions where the denominators are all multiples of the same number (on a number line).i.e. <math>\frac{1}{2}</math>, <math>\frac{1}{3}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{6}</math> and <math>\frac{1}{12}</math></i></li> <li>• <i>Solve problems involving fractions.</i></li> </ul>  |

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| <b>Week 6</b>  | <p><b>Multiplication and division to solve problems</b></p> <ul style="list-style-type: none"> <li>• Estimate answers</li> <li>• <i>Consider the most appropriate strategy to solve a calculation: calculate mentally, use a jotting or a written method</i></li> <li>• Multiply numbers up to 4 digits by a one- or two-digit number using an expanded written method.</li> <li>• Divide numbers up to 4 digits by a one-digit number using a compact written method of short division</li> <li>• Interpret remainders appropriately in the context of the question .</li> <li>• Solve problems involving multiplication and division</li> </ul>  |
| <b>Week 7</b>  | <p><b>Shape and position and direction to solve problems</b></p> <ul style="list-style-type: none"> <li>• <i>Know how to use a protractor</i></li> <li>• Know angles are measured in degrees</li> <li>• Estimate and compare acute, obtuse and reflex angles.</li> <li>• Draw given angles and measure them in degrees (°)</li> <li>• <i>Know how to compare lengths and angles to decide if a polygon is regular or not</i></li> <li>• Sort regular polygons and those that are not regular</li> <li>• Use the properties of rectangles to find missing lengths and angles <i>in given shapes.</i></li> <li>• Measure and calculate the perimeter of rectangular shapes in centimetres and/or metres</li> </ul> |
| <b>Week 8</b>  | <p><b>Measures -Time to solve problems</b></p> <ul style="list-style-type: none"> <li>• <i>Continue to read, write and convert time between analogue and digital 12 hour clocks.</i></li> <li>• <i>Know the link between the 12 hour and 24 hour clock</i></li> <li>• <i>read, write and convert time between analogue and digital 12 hour clock and 24 hour clock.</i></li> <li>• Complete, read and interpret information in timetables <i>Solve problems involving interpreting time tables</i></li> <li>• Solve problems involving converting between units of time e.g. seconds and minutes, half past 12 and 13:30.</li> </ul>   |
| <b>Week 9</b>  | <p><b>Statistics to solve problems</b></p> <ul style="list-style-type: none"> <li>• <i>Revise continuous and discrete data</i></li> <li>• <i>Read and understand scales, including estimating points that are between the numbers marked on the scales</i></li> <li>• Solve comparison, sum and difference problems using information presented in a line graph</li> <li>• Complete, read and interpret information in tables, including timetables.- <i>link to 24 hour clock</i></li> </ul>  |
| <b>Week 10</b> | <p><b>Assess and review</b></p>  |

Year 5

Terms 3 & 4

**Oral and Mental calculation**

- Read and write any number and use decimal notation for tenths and hundredths and know what each digit represents.
- Count forwards and backwards in steps of 0.01, 0.1, 1, 10, 100 and 1000 from any positive number or decimal.
- Count forwards and backwards in equal steps and describe any patterns in the sequence
- Count forward and backwards with both negative and positive numbers through zero
- Count forwards and backwards with fractions.
- Order and compare whole numbers up to 1 000 000, negative numbers and decimals with up to two decimal places.
- Recall and use addition and subtraction facts for 1 and 10 (with decimal numbers to one decimal place e.g.  $4.6 + 5.4 = 10$ ).
- Derive and use addition and subtraction facts for 1 (with decimal numbers to two decimal places (e.g.  $0.39 + 0.61 = 1$ )).
- Use partitioning to double or halve any number, including decimals to two decimal places.
- Know by heart facts for all multiplication tables up to  $12 \times 12$
- Multiply and divide whole numbers and decimals with up to two decimal places mentally by 10 or 100, and numbers by 1000 - *link to converting measures*
- Find all the factor pairs of a number,
- Find the common factors of two numbers.
- Round whole numbers to the nearest 10, 100, 1000 or a number with up to two decimal places to the nearest integer or number of decimal places.
- Count in fraction or decimal steps

**Week 1**

Number and place value to solve problems

- *Identify the value of each digit to two decimal place- using images or manipulatives- in a 6 or 7 digit numbers.*
- *Read and write numbers with two decimal places supported by images or manipulatives*
- *Round 6 or 7 digit numbers to the nearest 100 or 1000 using a number line*
- *Compare and order numbers with two decimal places on an empty number line -supported by images or manipulatives.*
- *Partition numbers into ones, tenths and hundredths (for example,  $37.49 = 30 + 7 + 0.4 + 0.09$  supported by practical resources*
- Round decimals with two decimal places to the nearest whole number and to one decimal place *using a number line.*
- Solve problems involving number up to two decimal places.

**Week 2**

Addition and subtraction to solve problems

- Estimate answers -including using rounding
- *Consider the most appropriate strategy to solve a calculation: calculate mentally, use a jotting or a written method*
- Add two or more whole numbers with more than 4 digits including using a compact written method of addition
- Add two or more decimals numbers with up to two decimal places, including using a compact written method of addition
- Subtract whole numbers with more than 4 digits including using a compact written method of subtraction
- Subtract decimals numbers with up to two decimal places, including using a compact written method of subtraction
- 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 and combinations of these

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| <p><b>Week 3</b></p> | <p><b>Measures - area to solve problems</b></p> <ul style="list-style-type: none"> <li>• <i>Revise finding the area of polygons by counting squares (year 4)</i></li> <li>• <i>Link area to arrays and use multiplication to find area</i></li> <li>• <i>Calculate the area of rectangles (including squares), using standard units, square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>)</i></li> <li>• <i>Estimate (and find) the area of irregular shapes.</i></li> <li>• <i>Compare the area of rectangles (including squares), using standard units, square centimetres (cm<sup>2</sup>) and square metres (m<sup>2</sup>)</i></li> <li>• <i>Solve problems involving area</i></li> </ul>  |
| <p><b>Week 4</b></p> | <p><b>Measures-length, mass and capacity to solve problems</b></p> <ul style="list-style-type: none"> <li>• <i>Estimate and work practically with measures</i></li> <li>• <i>Use, read and write standard units of length to a suitable degree of accuracy.</i></li> <li>• <i>Use, read and write standard units of mass to a suitable degree of accuracy</i></li> <li>• <i>Use, read and write standard units of capacity to a suitable degree of accuracy.</i></li> <li>• <i>Estimate (and find) volume (for example, using 1 cm<sup>3</sup> blocks to build cuboids (including cubes)</i></li> <li>• <i>Estimate (and find) capacity (for example, using water).</i></li> <li>• <i>Estimate answers to calculations including using rounding</i></li> <li>• <i>Consider the most appropriate strategy to solve a calculation: calculate mentally, use a jotting or a written method</i></li> <li>• <i>Add and subtract to solve problems involving measures including those involving decimal numbers up to two decimal place</i></li> </ul>  |
| <p><b>Week 5</b></p> | <p><b>Fractions to solve problems</b></p> <ul style="list-style-type: none"> <li>• <i>Continue to compare and order fractions whose denominators are all multiples of the same number on a number line</i></li> <li>• <i>Be introduced to mixed number and improper fractions-practically or with diagrams</i></li> <li>• <i>Write a mixed number e.g. <math>1\frac{1}{5}</math> and explain its meaning</i></li> <li>• <i>Write an improper fraction e.g. <math>11/6</math> and explain its meaning</i></li> <li>• <i>Convert mixed numbers to and improper fractions and vice versa.</i></li> <li>• <i>Revise adding fractions with the same denominator (using practical models and /or diagrams). (year 4)</i></li> <li>• <i>Revise subtracting fractions with the same denominator (using practical models and /or diagrams) (year 4)</i></li> <li>• <i>Add fractions with denominators that are multiples of the same number (using practical models and /or diagrams). - link to equivalent fractions and factors</i></li> <li>• <i>Subtract fractions with denominators that are multiples of the same number (using practical models and /or diagrams).- link to equivalent fractions and factors</i></li> <li>• <i>Write mathematical statements involving adding or subtracting fraction</i></li> <li>• <i>Convert an improper fraction answer to a mixed number,</i><br/> e.g. <math>\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}</math>.</li> </ul> |

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| <p><b>Week 6</b></p> | <p><b>Multiplication to solve problems</b></p> <ul style="list-style-type: none"> <li>• Estimate answers and use rounding</li> <li>• <i>Consider the most appropriate strategy to solve a calculation: calculate mentally, use a jotting or a written method</i></li> <li>• Multiply numbers up to 4 digits by a one- or two-digit number using a compact written method, including long multiplication for two-digit numbers.</li> <li>• Solve problems involving multiplication including using their knowledge of factors and multiples, cubes and squares.</li> <li>• Solve problems involving multiplication, including <ul style="list-style-type: none"> <li>- scaling by simple fractions</li> <li>- problems involving simple rates.</li> </ul> </li> <li>• Solve problems involving addition, subtraction, multiplication and division and combinations of these</li> </ul>   |
| <p><b>Week 7</b></p> | <p><b>Shape and position and direction to solve problems</b></p> <ul style="list-style-type: none"> <li>• Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.</li> <li>• Use the properties of rectangles to calculate missing lengths and angles.</li> <li>• Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.</li> <li>• Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.</li> <li>• Continue to draw given angles, and measure them in degrees (<math>^{\circ}</math>).</li> <li>• Identify angles at a point and one whole turn (total <math>360^{\circ}</math>).</li> <li>• Identify angles at a point on a straight line and a turn (total <math>180^{\circ}</math>).</li> <li>• Identify other multiples of <math>90^{\circ}</math>.</li> <li>• Solve problems involving shapes</li> <li>• Solve problems involving angles</li> </ul> |
| <p><b>Week 8</b></p> | <p><b>Position and Direction to solve problems</b></p> <ul style="list-style-type: none"> <li>• Describe positions on the first quadrant of a coordinate grid.</li> <li>• Plot specified points and complete shapes.</li> <li>• Identify, describe and represent the position of a shape following a reflection using the appropriate language, and know that the shape has not changed.</li> <li>• Identify, describe and represent the position of a shape following a translation, using the appropriate language, and know that the shape has not changed</li> <li>• Solve problems involving position and/ or direction</li> </ul>   |
| <p><b>Week 9</b></p> | <p><b>Division to solve problems</b></p> <ul style="list-style-type: none"> <li>• Estimate answers</li> <li>• <i>Consider the most appropriate strategy to solve a calculation: calculate mentally, use a jotting or a written method</i></li> <li>• Divide numbers up to 4 digits by a one-digit number using a written method of short division</li> <li>• interpret remainders appropriately for the context.</li> <li>• Solve problems involving addition, subtraction, multiplication and division and combinations of these</li> <li>• Solve problems involving division, including <ul style="list-style-type: none"> <li>- scaling by simple fractions</li> </ul> </li> </ul>   |

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|                | - problems involving simple rates. |
| <b>Week 10</b> | <i>Assess and review</i>           |

Year 3

Terms 5 & 6

**Oral and Mental calculation**

- Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit.
- Read, write, order and compare numbers with up to three decimal places.
- Round decimals with two decimal places to the nearest whole number.
- Round decimals with two decimal places to one decimal place
- Round whole numbers and decimal numbers to the nearest 10, 100, 1000.
- Know what each digit represents in any number or decimal number
- Count forwards and backwards in steps of 0.01, 0.1, 1, 10, 100, and 1000 from any positive number or decimal
- Count forwards and backwards with positive and negative whole numbers, including through zero.
- Count forwards and backwards in equal steps
- Count on and back in fractional steps including mixed numbers such as  $1\frac{1}{2}$ .
- Count on and back in decimal steps.
- Order and compare numbers, negative numbers, fractions or decimal numbers up to two decimal places.
- Know by heart facts for all multiplication tables up to 12 x 12
- Find all the factors pairs of a number,
- Find the common factors of two numbers.
- Add and subtract numbers mentally
- Find related facts from known addition, subtraction, multiplication or division facts
- Use partitioning to double or halve any decimal number
- Multiply and divide whole numbers and decimals by 10, 100 or 1000 and apply this to converting units of measurement.

**Week 1**

Number and place value solve problems

- *Identify, represent and estimate numbers using the number line and place value counters.*
- *Identify the value of each digit from millions to numbers with at least two decimal places using place value counters.*
- *Create, complete and extend number sequences including those with multiplication and division steps Continue to order temperatures including those below 0°C.*
- Interpret negative numbers in context
- Solve number problems and practical problems that involve number and/or place value

**Week 2**

Fractions-addition and subtraction to solve problems

- Recognise mixed numbers and improper fractions and convert from one to another
- Compare and order fractions whose denominators are all multiples of the same number (*including on a number line*).
- Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.
- Estimate answers
- *Consider the most appropriate strategy to solve a calculation: calculate mentally, use a jotting or a written method*



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|               | <ul style="list-style-type: none"> <li>• Add fractions with the same denominator and denominators that are multiples of the same number (<i>using diagrams and/ or manipulatives</i>).</li> <li>• Subtract fractions with the same denominator and denominators that are multiples of the same number (<i>using diagrams and/or manipulatives</i>).</li> <li>• Solve problems involving addition and/or subtraction of fractions</li> </ul>   |
| <b>Week 3</b> | <p>Fractions -multiplication to solve problems</p> <ul style="list-style-type: none"> <li>• Continue to recognise mixed numbers and improper fractions and convert from one form to another.</li> <li>• Continue to compare and order fractions whose denominators are all multiples of the same number (<i>including on a number line</i>).</li> <li>• Continue to identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.</li> <li>• Estimate answers</li> <li>• <i>Consider the most appropriate strategy to solve a calculation: calculate mentally, use a jotting or a written method</i></li> <li>• Multiply proper fractions by whole numbers, supported by materials and diagrams - <i>link to equivalent fractions and factors</i></li> <li>• Multiply mixed numbers by whole numbers, supported by materials and diagrams - <i>link to equivalent fractions and factors</i></li> <li>• Solve problems involving multiplications of fractions</li> </ul>   |
| <b>Week 4</b> | <p>Percentages- to solve problems</p> <ul style="list-style-type: none"> <li>• Recognise the per cent symbol (%)</li> <li>• understand that per cent relates to 'number of parts per hundred'</li> <li>• <i>understand the link between key fractions, decimals and percentages e.g. <math>\frac{1}{2}</math>, 0.5 and 50%</i></li> <li>• write percentages as a fraction with denominator 100</li> <li>• write percentages as a decimal</li> <li>• <i>solve problems with percentages' including those where it is necessary to work backwards and find 10%</i></li> <li>• Solve problems which require knowing percentage and decimal equivalents of</li> <li>• <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{5}</math>, <math>\frac{1}{10}</math></li> <li>• Solve problems which require knowing of the percentage and decimal equivalents of <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{5}</math>, <math>\frac{2}{5}</math>, <math>\frac{4}{5}</math></li> <li>• Solve problems which require knowledge of the decimal and percentage equivalent of and those fractions with a denominator of a multiple of 10 or 25</li> </ul> |
| <b>Week 5</b> | <p>Addition and subtraction to solve problems</p> <ul style="list-style-type: none"> <li>• Estimate answers</li> <li>• <i>Consider the most appropriate strategy to solve a calculation: calculate mentally, use a jotting or a written method</i></li> <li>• Add whole numbers with more than 4 digits and decimals with two decimal places, including using a compact written method</li> <li>• Subtract whole numbers with more than 4 digits and decimals with two decimal places, including using a compact written method</li> <li>• Solve problems involving addition, subtraction, multiplication and division and combinations of these</li> </ul>   |

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| <p><b>Week 6</b></p>  | <p><b>Multiplication and division to solve problems</b></p> <ul style="list-style-type: none"> <li>• Estimate answers</li> <li>• <i>Consider the most appropriate strategy to solve a calculation: calculate mentally, use a jotting or a written method</i></li> <li>• Multiply numbers up to 4 digits by a one- digit number including using a compact written method</li> <li>• Multiply numbers up to 4 digits by a two-digit number including using a compact written method of long multiplication.</li> <li>• Divide numbers up to 4 digits by a one-digit number including using a written method of short division</li> <li>• Interpret remainders in line with the context of the question.</li> <li>• Solve problems involving multiplication and division, including <ul style="list-style-type: none"> <li>- scaling by <i>numbers</i> and simple fractions</li> <li>- problems involving simple rates.</li> </ul> </li> <li>• Solve problems involving addition, subtraction, multiplication and division and combinations of these.</li> </ul> |
| <p><b>Week 7</b></p>  | <p><b>Measures -Time to solve problems</b></p> <ul style="list-style-type: none"> <li>• <i>Continue to read, write and convert time between analogue and digital 12 and 24-hour clocks.</i></li> <li>• Complete, read and interpret information in tables, including timetables.</li> <li>• Solve problems involving converting between units of time.</li> <li>• Understand and use approximate equivalences between metric and common imperial units such as pints.</li> <li>• Solve comparison, sum and difference problems using information presented in <i>all types of graph and tables including a line graphs</i></li> </ul>   |
| <p><b>Week 8</b></p>  | <p><b>Measures to solve problems</b></p> <ul style="list-style-type: none"> <li>• Recognise and use square numbers and cube numbers, and the notation for squared (<sup>2</sup>) and cubed (<sup>3</sup>).</li> <li>• Continue to calculate and compare the area of rectangles (including squares), using standard units, square centimetres (cm <sup>2</sup>) and square metres (m <sup>2</sup>)</li> <li>• Continue to estimate (<i>and find</i>) the area of irregular shapes.</li> <li>• Use all four operations to solve problems involving measure (for example, mass, capacity and volume) using decimal notation, including scaling.</li> <li>• Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints</li> </ul>  |
| <p><b>Week 9</b></p>  | <p><b>Shape and position and direction to solve problems</b></p> <ul style="list-style-type: none"> <li>• Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes</li> <li>• Use the properties of rectangles to find missing lengths and/or angles.</li> <li>• Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.</li> <li>• Describe positions on the first quadrant of a coordinate grid.</li> <li>• Plot specified points and complete shapes.</li> <li>• Continue to 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</li> </ul>  |
| <p><b>Week 10</b></p> | <p><b>Assess and review</b></p>   |

**Non-negotiable requirements for the provision of Subject:**

- Each classroom will have a visible number line to 100
- Each classroom will have a maths resource stacker with equipment that the children will have access to in any maths lesson

**Promoting Pupils' Spiritual, Moral, Social and Cultural Development:**

Spiritual Development

- Encouraging pupils to reflect and learn from reflection
- Develop a climate or ethos within which all pupils can grow and flourish, respect others and be respected
- Monitoring, in simple, pragmatic ways, the success of what is provided
- Promote teaching styles which:
  - Value pupils' questions and give them space for their own thoughts, ideas and concerns
  - Enable pupils to make connections between aspects of their learning
  - Encourage pupils to relate their learning to a wider frame of reference - for example, asking 'why?', 'how?' and 'where?' as well as 'what?'

Moral Development

- Providing a clear moral code as a basis for behaviour which is promoted consistently through all aspects of the school
- Developing an open and safe learning environment in which pupils can express their views and practise moral decision-making

Social Development

- Encouraging pupils to work co-operatively

Cultural Development

- Recognising and nurturing particular gifts and talents

**Year 5**

**Suggested Activities**

| <b>NUMBER</b>                      | <b>Children should have opportunities to</b>   |
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| <b>Number and place value</b>      | <ul style="list-style-type: none"> <li>• Reinforce their understanding of the structure of the number system based on groups of 10 i.e. 10 ones make a ten , ten tens make a hundred and so on</li> <li>• use place-value counters and place value charts to compare 3, 4 and 5 digit numbers -digit by digit from left and then place numbers on a partly numbered or blank number line e.g. 2706 on a line marked in multiples of 1000</li> <li>• link the reciting of number names to counting by using visual images of numbers - , counting stick, bead strings, number lines and manipulatives</li> <li>• Count forwards and backwards in decimals in using counting stick, bead strings, number lines and manipulatives as support. Practice the transitions such as 1.09 to 1.1 or 9.99 to 10</li> <li>• use concrete objects, partially marked number lines, manipulatives, place value charts and money to represent and compare numbers to 1 000 000 including money and measures.</li> <li>• Read and write numbers in numerals and words</li> <li>• Use &lt; , &gt; or = when ordering numbers</li> <li>• use manipulatives or money to partition multi digit 3-digit numbers and decimal numbers</li> <li>• use manipulatives or money to represent a number that is 10 or 100 more than/less than a multi -digit number</li> <li>• use place-value cards and place value grids to illustrate and explain place values, e.g. the digit 3 stands for 300, 30 or 3 depending on where it appears in a number.</li> <li>• Use number lines to illustrate rounding numbers e.g. what is 14 489 to the nearest 1000?</li> <li>• Use counting stick and/or number lines to show positive and negative numbers</li> <li>• Use models to explain negative numbers - lifts that go below the ground floor, swimming pool steps that go below the water etc.as well as temperature</li> <li>• Find, explain the term -to -term rule in words and generalise for number sequences they have created including those involving fractions , decimals or negative numbers</li> </ul> |
| <b>Addition and subtraction</b>    | <ul style="list-style-type: none"> <li>• Estimate answers</li> <li>• Consider the most appropriate strategy to solve a calculation: calculate mentally, use a jotting or a written method</li> <li>• Tell me two addition or subtraction calculations you would do in your head and to that you would chose to write down</li> <li>• Estimate answers using rounding to nearest 10,100 or 1000</li> <li>• Link calculations to money and measures</li> <li>• How many ways can you add 8 odd numbers to make 20? What about 6 odd numbers to make 15?</li> <li>• know and use the fact that addition and subtraction are inverse operations when calculating</li> </ul>  |
| <b>Multiplication and division</b> | <ul style="list-style-type: none"> <li>• Identify factors and multiples-use arrays</li> <li>• Identify factor pairs -use arrays-and know how they can support mental calculation/jottings e.g. multiplying larger numbers by 8 could be broken down in to multiplying by 2 and then by 4 as these are factor pairs of 6</li> </ul>   |

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|  | <ul style="list-style-type: none"> <li>• Understand that numbers with only one pair of factors the number itself and 1 i.e. (1,7) are prime numbers</li> <li>• Understand that numbers with a factor pair made up of the same numbers i.e. (5,5) are square numbers</li> <li>• Understand cubed numbers as a number x that number x that number i.e. <math>3 \times 3 \times 3</math></li> <li>• Understand scaling problems and include both scaling up (making amount larger) and scaling down (making amounts smaller)</li> <li>• Use scale drawings and maps -link to scaling</li> <li>• Find the highest common factor two numbers such as 4 and 5.-link to Venn diagrams -common factors will be in the intersection</li> <li>• Find the lowest common multiple by listing the first few multiples of the two numbers until you find a common one link to Venn diagrams -common multiples will be in the intersection -</li> <li>• Use simple rates -speed - Km per hour or cost- pounds per metre for material</li> <li>• know and use the fact that multiplication and division are inverse operations when calculating</li> </ul>   |
| <p><b>Fractions (including decimals and percentages)</b></p> | <p><b>FRACTIONS</b></p> <ul style="list-style-type: none"> <li>• Reinforce terms denominator and numerator</li> <li>• Compare and order fractions with related denominators</li> <li>• Use counting sticks , objects , double number lines and diagrams to support learning of equivalent fractions</li> <li>• Link factors and multiples to finding equivalent fractions -100 square can be used</li> <li>• Consider the most appropriate strategy to solve a calculation: calculate mentally, use a jotting or a , written method</li> <li>• Fractions ie <math>\frac{3}{4}</math> can be seen as 3 lots of <math>\frac{1}{4}</math> or <math>\frac{1}{4}</math> of 3 can be seen</li> <li>• Use knowledge of equivalent fractions to add fractions in the <i>twelfths family</i> - i.e. <math>\frac{1}{2}, 1/3, 1/4, 1/6</math> and <math>1/12</math> where the answer is less than 1-using manipulatives and diagrams</li> <li>• Use knowledge of equivalent fractions to subtract fractions in the <i>twelfths family</i> - i.e. <math>\frac{1}{2}, 1/3, 1/4, 1/6</math> and <math>1/12</math> using manipulatives and diagrams</li> <li>• Know that fractions can be bigger than 1</li> <li>• Understand mixed numbers e.g. <math>2 \frac{1}{3}</math> and improper fractions e.g. <math>\frac{13}{6}</math> and convert between the two</li> <li>• Understand that to add fractions they need to all be the same type e.g. to add <math>\frac{2}{3}</math> and <math>\frac{5}{12}</math> they both need to have the same denominator, either thirds or twelfths AND it must be twelfths is the common one.</li> <li>• Add fractions in the <i>twelfths family</i> - i.e. <math>\frac{1}{2}, 1/3, 1/4, 1/6</math> and <math>1/12</math> or <i>tenths family</i> <math>1/5, 1/10</math> where the answer is more than 1-using manipulatives and diagrams</li> <li>• Subtract fractions in the <i>twelfths family</i> - i.e. <math>\frac{1}{2}, 1/3, 1/4, 1/6</math> and <math>1/12</math> or <i>tenths family</i> <math>1/5, 1/10</math> -using manipulatives and diagrams</li> <li>• Multiply proper fractions by whole numbers using models and images and manipulatives to support i.e. <math>\frac{1}{4} \times 5</math></li> </ul> <p><b>DECIMALS</b></p> <ul style="list-style-type: none"> <li>• Use ITP Decimal Number Lines to support ordering and rounding of decimals</li> <li>• Reinforce understanding of decimals as a way of expressing fractions of number less than one as ten times smaller</li> </ul> |

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|                    | <p>(tenths ) or one hundred times smaller(hundredths )</p> <ul style="list-style-type: none"> <li>• Understand that 1/10 is written as 0.1 and 1/100 as 0.01</li> <li>• Compare and order decimals</li> <li>• Know decimal equivalents for <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, 1/5, 1/10 and 1/100 and how to use this to calculate other decimal equivalents e.g. 4/5</li> <li>• Use practical resources and manipulatives to visually represent the size of ones/tenths/hundredths</li> <li>• Create decimal sequences</li> <li>• Use double sided counting sticks to show relationship between 18 and 1.8 etc</li> <li>• Link decimals to measures and money</li> <li>• Use spider diagrams to explore known facts <math>7 \times 6 = 42</math> so <math>0.07 \times 6 =</math> etc</li> <li>• Explicitly show links between <math>328 \times 8 = 2608</math> and <math>3.26 \times 8 = 26.08</math></li> <li>• Place the number 3, 5, 7 and 9 into these boxes? <math>\times ? \cdot ? =</math> to make two decimal numbers.</li> <li>• How many ways can you do this and get a product between 30 and 50?</li> </ul> <p><b>PERCENTAGES</b></p> <ul style="list-style-type: none"> <li>• Fractions ITP can be used to show links between fractions and percentages. A double sided number line can also make the link.</li> <li>• Percent means out of 100 ( % is a misprint =/00 !)</li> <li>• Finding 1 % or 10% is a useful starting point for calculating other percentages by doubling and/or halving. Percentage webs are helpful.</li> <li>• Area ITP can be used to show a 10 x 10 grid to show 35 out of 100 or 35/100 as 35%</li> <li>• Use money to show how 10p can be expressed as a fraction or a percentage of £1</li> <li>• Locate fractions, decimals, and percentages on lines marked 0-1, 0-1 and 0-100%.</li> <li>• Locate <math>\frac{1}{2}</math>, 1/10, 3/10 and 7/10 on fraction line and find percentage equivalents</li> <li>• Know that percentages can be bigger than 100%</li> </ul> |
| <b>MEASUREMENT</b> |   |
|                    | <ul style="list-style-type: none"> <li>• Make links with other subjects-PE, science , DT and continue to carry out practical measuring</li> <li>• Estimate answers</li> </ul> <p><b>LENGTH, MASS/WEIGHT/CAPACITY</b></p> <ul style="list-style-type: none"> <li>• Calculate measurement calculation with addition, subtraction , multiplication , division or a combination of these</li> <li>• Convert between units kilometre/metre; centimetre / metre; centimetre /millimetre; gram /kilogram; litre /millilitre when working practically and when calculating</li> </ul> <p><b>AREA ( the surface inside a shape)</b></p> <ul style="list-style-type: none"> <li>• Calculate practically by counting squares and check using multiplication</li> <li>• Link area to arrays and multiplication</li> <li>• Estimate and then count the areas of irregular shapes</li> <li>• Calculate area from scaled drawings</li> </ul> <p><b>VOLUME ( the amount of space taken up by a 3D shape)</b></p>  |

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|                 | <ul style="list-style-type: none"> <li>• Make cube and cuboids using multilink or base 10 ones.</li> <li>• Link finding the area of a rectangle/square 6x6 to find the volume of a cube 6 x6 x6 or cuboid</li> </ul> <p><b>TIME</b></p> <ul style="list-style-type: none"> <li>• Continue to practice reading analogue to the nearest minute and digital clocks</li> <li>• Learn number bonds for 60</li> <li>• Use number lines to calculate the passage of time</li> <li>• Convert between different units of time- seconds /minutes, minutes/hours , hours/days and /or days/weeks</li> <li>• Compare times on analogue and digital clock</li> <li>• Investigate the 24 hour clock -link to time tables</li> </ul>   |
| <b>GEOMETRY</b> |   |
|                 | <ul style="list-style-type: none"> <li>• Use Fixing Point ITP to create differ triangles to show angles still total <math>180^{\circ}</math></li> <li>• Extend knowledge of shapes to include names and properties of types of triangles and quadrilaterals including irregular shapes and those in different orientations</li> <li>• Draw lines to the nearest mm.</li> <li>• Understand angle as a measure of turn that can physically move - i.e. a compass needle moving from north to west , or be shown pictorially i.e. the angles in a triangle.</li> <li>• Relate acute, obtuse and reflex angles to "magic " <math>90^{\circ}</math> ( right angles ) and other bench mark measures <math>45^{\circ}</math> and <math>180^{\circ}</math></li> <li>• Measure angles with a protractor and aim for accuracy within one degree.</li> <li>• Mark parallel lines and right angles with conventional symbols</li> <li>• Use knowledge of angles to calculate the size of "missing" angles in triangles and other shapes Use ITP<br/>Calculating Angles</li> <li>• Use knowledge of angles, diagonals and parallel lines to calculate sizes of missing angles formed when lines/sides cross i.e. F and Z angles</li> <li>• Investigate tessellation when looking at angles around a point to find which shapes will tessellate and which will not.</li> <li>• Construct polygons from given measurements for the sides and/or angles based on their knowledge of shape properties</li> <li>• Name and classify 2D and 3D shapes using properties such as length of sides, size of angles etc.</li> <li>• Explain what is the same and what is different about two shapes i.e. a scalene and a right angle triangle or a trapezium and a rhombus</li> <li>• Compare the length of sides and the size of angles to decide if a shape is regular or not. Use term "irregular" for shapes which do not have equal sides and equal angles</li> <li>• Learn and apply the term "diagonal" when describing the properties of quadrilaterals</li> <li>• Apply knowledge of perimeter and shapes to find the perimeter of regular shapes.</li> <li>• Know that angles are measured in degrees: a right angles is <math>90^{\circ}</math>,</li> <li>• a full turn is <math>360^{\circ}</math>, an angle on a straight line is <math>180^{\circ}</math> and half a right angle is <math>45^{\circ}</math>.</li> </ul> |

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|                                      | <ul style="list-style-type: none"> <li>• Recognise right angles as properties of squares and rectangles and know that each angle in an equilateral triangle is <math>60^\circ</math>.</li> <li>• Make and describe turns of <math>30^\circ</math>, <math>60^\circ</math> and <math>90^\circ</math> using the hands of a clock, e.g. from 10 o'clock to 2 o'clock.</li> <li>• sort pictures of angles into sets or order them from smallest to largest.</li> <li>• They make sensible estimates of the size of angles less than <math>180^\circ</math></li> <li>• measure angles to within 5 degrees using a protractor or angle measurer.</li> <li>• Plot the missing vertex of a square with sides not parallel or perpendicular to the axes and then check that each angle is <math>90^\circ</math>.</li> </ul>   |
| <p><b>Position and direction</b></p> | <ul style="list-style-type: none"> <li>• Use Symmetry ITP, Coordinates ITP and Isometric grid ITP</li> <li>• Use geo-boards, shape tiles and sets of shapes to make shapes.</li> <li>• Use squared, isometric and tracing paper to draw shapes</li> <li>• REFLECTION-length of sides and size of angles are unchanged; orientation and position of shape can be changed ;shape is "flipped over"</li> <li>• TRANSLATION <ul style="list-style-type: none"> <li>-length of sides and size of angles are unchanged; orientation of shape is unchanged ;position is changed</li> </ul> </li> <li>• Use different types of paper to predict where the image will be after a transformation and explain strategies. May help to look at one vertex at a time.</li> <li>• Reflect shapes in a variety of mirror lines <ul style="list-style-type: none"> <li>- Parallel or perpendicular to the sides of the shape</li> <li>- Not parallel or perpendicular to the sides of the shape</li> <li>- Are the sides of the shape</li> <li>- Pass through the shape</li> </ul> </li> <li>• Translate a shape in one direction and give new co-ordinates.</li> <li>• Begin to predict co-ordinates based on knowledge of the properties of shapes</li> <li>• Reflect a shape in one direction and give new co-ordinates.</li> <li>• Begin to predict co-ordinates based on knowledge of the properties of shapes</li> <li>• Draw polygons onto grids and identify their co-ordinates</li> <li>• Plot co-ordinate for the rest of the corners of a named 2D shapes in the first quadrant and complete the shape</li> <li>• Apply knowledge of the properties of shapes when reflecting or transforming shapes on a grid</li> <li>• Recognise properties of rectangles such as: All four angles are right angles; Opposite angles are equal and parallel; The diagonals bisect one another.</li> <li>• Know the labelling convention for: <ul style="list-style-type: none"> <li>triangles - capital letters for the vertices(going round in order, clockwise or anticlockwise) and corresponding lower-case letters for each opposite side, the triangle then being described as <math>\triangle ABC</math>;</li> <li>equal sides and parallel sides in diagrams.</li> </ul> </li> <li>• read and plot coordinates in the first quadrant and explain why the point (4, 1) is not the same as (1, 4).</li> <li>• plot the missing points to draw shapes, recognising that there may be more than one solution to the problem. For</li> </ul> |



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|   | example: if (6, 5) and (8, 5) are two vertices of a square, they find all three possibilities for the pair of missing vertices  |
| <b>STATISTICS</b>   |   |
| <ul style="list-style-type: none"> <li>▪ solve comparison, sum and difference problems using information presented in a line graph</li> <li>▪ complete, read and interpret information in tables, including timetables</li> </ul> | <ul style="list-style-type: none"> <li>• give examples of discrete(shoe sizes) and continuous data(growth of a plant) and explain the difference</li> <li>• Explore data where the intermediate points do and don't have meaning and make sure children know that line graphs should only be used when the intermediate points do have meaning</li> <li>• Link scales to partly marked number lines</li> <li>• Model the conventions of line graphs - labels on the axis , scales on the axes and a title- Line Graph ITP can be used</li> <li>• Look at line graphs with no titles or labels and suggest stories they could represent -something increasing or decreasing, something changing, something getting steeper or flatter.</li> <li>• Look at temperature graphs that do not start at 0.</li> <li>• Ask children to complete unfinished graphs</li> <li>• Cover up parts of a graph and ask them to predict what might be happening behind the covered area</li> <li>• Draw conversion graphs for metric units to imperial such as pints to litres and use to solve problems</li> <li>• Consider the best way to present data - graph, chart , table etc.</li> </ul> |