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| <b>Subject :</b> | Maths |
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| <b>Scheme title</b> | <b>Half term 2 - September</b> |
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| <b>Purpose of scheme</b> | To develop fluency, problem solving and reasoning skills across the 6 key areas of number, algebra, geometry and measures, statistics, probability and ratio and proportion |
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| <b>Skills</b> | <p>Number - Written Methods</p> <ul style="list-style-type: none"> <li>• Be able to order, add and subtract positive and negative numbers in context (P)</li> <li>• Add, divide, subtract and multiply using written methods</li> <li>• Add and subtract decimals up to 2dp. (P)</li> <li>• BIDMAS operations (P)</li> <li>• Understand the values of money on a calculator and be able to solve worded problems.</li> </ul> <p>Negative numbers on a number line.</p> <ul style="list-style-type: none"> <li>• Adding and subtracting negative numbers</li> <li>• Multiplying and Dividing negative numbers</li> <li>• Multiply decimal by whole number; multiply decimal by decimal.</li> </ul> <p>Number - Use of a Calculator</p> <ul style="list-style-type: none"> <li>• To be confident in using a calculator efficiently and appropriately to perform complex calculations with numbers of any size.</li> <li>• Understand how to use of square, root, cube and recurring fraction keys</li> <li>• Understand the implications on negative squares on a calculator.</li> </ul> <p>Algebra - Sequences</p> <ul style="list-style-type: none"> <li>• Generate and describe simple integer sequences by working out the term-to-term rule.</li> <li>• Be able to state the next terms of a sequence given the rule</li> <li>• Generate the next drawing in a number pattern</li> <li>• State the nth term rule</li> </ul> <p>Geometry and Measures - Area and Perimeter</p> <ul style="list-style-type: none"> <li>• To accurately draw and measure straight lines. (P)</li> <li>• Secure use of calculators, measurements, addition and multiplication. (P)</li> <li>• To find the perimeter and area of simple 2D shapes by counting squares.</li> <li>• Estimate the area of irregular shapes by counting squares</li> <li>• To use the formula to find the area of rectangles</li> <li>• To find missing lengths when given the area</li> <li>• To use a formula to find the area of triangles, parallelograms, and trapeziums.</li> <li>• To calculate the area of compound shapes</li> </ul> <p>Statistics - MMR - Averages</p> <ul style="list-style-type: none"> <li>• Be secure in multiplication, addition and division. (P)</li> <li>• Secure use of calculator. (P)</li> <li>• Be able to calculate the Mean, Median, Mode and Range for a given set of data.</li> <li>• Extension - be able to find the mean from a frequency table (discrete data).</li> </ul> |
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| <b>Key Words</b> | <p>Addition<br/> Subtraction<br/> Multiply<br/> Divide<br/> Integer<br/> Decimal<br/> Negative<br/> Sequence<br/> Pattern<br/> Average<br/> Area<br/> Perimeter<br/> Irregular<br/> Regular<br/> Circumference<br/> Compound shape</p> |
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| <b>End Point</b> | <b>Students are able to understand and apply the skills identified above.</b> |
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|  | <p>After each topic in bold (listed opposite), students complete a reflection grid which is marked in class then later teacher marked. This will be stuck in books to record progress and support revision.</p> <p>Students complete one formal assessment per term using diagnostic questions or in written form</p> |
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| <b>Assessment method</b> |  |
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**Year Group:**

| Half term 3 - November   | Half term 4 - January  |
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| <p>To develop fluency, problem solving and reasoning skills across the 6 key areas of number, algebra, geometry and measures, statistics, probability and ratio and proportion</p>   | <p>To develop fluency, problem solving and reasoning skills across the 6 key areas of number, algebra, geometry and measures, statistics, probability and ratio and proportion</p>   |
| <p>Number - Types of numbers</p> <ul style="list-style-type: none"> <li>• Be secure in times tables (P)</li> <li>• To understand what is meant by a factor and a multiple. (LCM &amp; HCF not tested) (P)</li> <li>• To be able to list all the prime numbers up to 20. (P)</li> <li>• To be able to recognise 12 to 152 and their square roots. (P)</li> <li>• To know how to use the square and square root keys on calculators. (P)</li> <li>• To recognise the triangular number sequence and find the first 10 terms.</li> <li>• To be able to recognise cube numbers up to <math>5^3</math> and their cube roots (and use calculator efficiently)</li> <li>• To understand why there are two solutions for equations such as <math>x^2=16</math> and <math>5x^2=45</math></li> <li>• Use and apply the three basic rules of indices with positive and negative powers.</li> </ul> <p>Number - Fraction arithmetic</p> <ul style="list-style-type: none"> <li>• To be able to recognise simple fractions and understand when two or more fractions are equivalent. (P)</li> <li>• To be secure in times tables (P)</li> <li>• To be secure in the four operations: multiplication, division, addition and subtraction. (P)</li> <li>• To be able to add and subtract simple fractions and those with the same denominators extending to those with different denominators.</li> <li>• To multiply and divide proper fractions</li> <li>• To be able to calculate a fraction of a given amount (incl. multiplying and dividing a fraction with an integer).</li> <li>• To add and subtract mixed numbers; to multiply and divide mixed numbers</li> <li>• 4 operations with simple algebraic fractions (not tested)</li> </ul> <p>Number - FDP equivalence</p> <ul style="list-style-type: none"> <li>• To recall simple equivalent FDP (eg. 25%, 50%, 75%, 10%, 20%...)</li> <li>• To be able to understand and use equivalent fractions, decimals and percentages.</li> <li>• Converting between decimals, fractions and percentages</li> <li>• Ordering decimals, fractions and percentages</li> <li>• Convert recurring decimals to fractions (not tested)</li> </ul> <p>Algebra - Simplifying and Solving</p> <ul style="list-style-type: none"> <li>• To be able to write simple algebraic expressions, using symbols or letters to represent an unknown value. (P)</li> <li>• To be able to simplify expressions by collecting like terms, including adding and subtracting expressions with 2 variables.</li> <li>• To be able to simplify expressions by multiplying and dividing (eg. <math>4a/2a</math>)</li> <li>• To be able to substitute into expressions and a given formula in words, extending to algebraic formula.</li> </ul> <p>Ratio, Proportion and rates of change - ratio</p> <ul style="list-style-type: none"> <li>• To be secure in times tables, calculator methods and the four operations (P)</li> <li>• To write down and simplify ratios.</li> <li>• To simplify ratios in to the form 1:n, or n:1</li> <li>• To be able to divide an amount in a given ratio.</li> <li>• Solve proportion problems using the unitary method</li> </ul> | <p>Number - Percentages</p> <p>To be able to describe a proportion of a whole as a percentage (convert simple fractions to percentages, including diagrams) (P)</p> <p>To be secure in the four operations: multiplication, division, addition, subtraction. (P)</p> <p>To be able to find simple percentages of amounts – 1%, 5%, 10%, 20%, 50%, 25% (P)</p> <p>To be able to find % (non-calculator) using build up method i.e. <math>15\% = 10\% + 5\%</math></p> <p>To be able to calculate simple increase and decrease percentages (non-calculator)</p> <p>To be able to calculate more complicated percentages of amounts (non-calculator) i.e. 33%, 67%</p> <p>To be able to calculate percentages using calculator methods</p> <p>To find the percentage change given the original and current values</p> <p>To be able use a multiplier to increase and decrease an amount by a given percentages.</p> <p>To apply the multiplier method to work out questions involving simple and compound interest.</p> <p>Ratio, Proportion and rates of change - Scales</p> <p>To be secure in reading scales. (P)</p> <p>Students should be able to read <math>\frac{1}{2}</math> past, <math>\frac{1}{4}</math> past and <math>\frac{1}{4}</math> to on an analogue clock. (P)</p> <p>They understand that time can be in a 12 or 24 hour format and are confident at converting 12 hour time to 24 hour and vice versa.</p> <p>They can, given two times, work out the difference between them. They should be able to plan a journey or schedule based upon reading and interpreting a timetable correctly (bus timetable; train timetable; TV schedule etc)</p> <p>Change freely between units eg. Time. Length, area, volume, capacity and mass</p> <p>Convert between metric and imperial (P)</p> <p>Geometry and Measures – Area and Circumference of a Circle</p> <p>Investigate <math>\pi</math> and its origins leading to deducing the formula of the circumference.</p> <ul style="list-style-type: none"> <li>• To be able to find the Area and Circumference of a circle.</li> <li>• To be able to find the perimeter and area of semi circles.</li> <li>• To be able calculate the area of a sector and arc length.</li> <li>• Solving circle problems involving compound shapes and leave your answer in terms of <math>\pi</math>.</li> </ul> <p>Algebra - Equations</p> <ul style="list-style-type: none"> <li>• To substitute integers into expressions.</li> <li>• To be able to expanding single brackets</li> <li>• Expanding single brackets with negatives eg. <math>4(x + 2) - 3(x - 5)</math></li> <li>• Expanding double brackets</li> <li>• To be able to solve basic one-step and two-step linear equations.</li> <li>• To be able to solve basic linear equations including brackets</li> <li>• Solve equations with the unknown on both sides (also with brackets).</li> <li>• Solve equations with unknown on both sides (including brackets)</li> </ul> |
| <p>Multiple</p> <p>Factor</p> <p>Square</p> <p>Square root</p> <p>Cube</p> <p>Cube root</p> <p>Equivalent</p> <p>Simplify</p> <p>Solve</p> <p>Expand</p> <p>Evaluate</p> <p>Relative frequency</p> <p>Chance</p> <p>Linear</p> <p>Quadratic</p> <p>Bracket</p> <p>Denominator</p> <p>Numerator</p>   | <p>Increase</p> <p>Decrease</p> <p>Multiplier</p> <p>Frequency</p> <p>Difference</p> <p>Arc</p> <p>Sector</p> <p>Calculate</p> <p>Interpret</p> <p>Construct</p>   |
| <p><b>Students are able to understand and apply the skills identified above.</b></p>   | <p><b>Students are able to understand and apply the skills identified above.</b></p>   |
| <p>After each topic in bold (listed opposite), students complete a reflection grid which is marked in class then later teacher marked. This will be stuck in books to record progress and support revision.</p> <p>Students complete one formal assessment per term using diagnostic questions or in written form.</p>   | <p>After each topic in bold (listed opposite), students complete a reflection grid which is marked in class then later teacher marked. This will be stuck in books to record progress and support revision.</p> <p>Students complete one formal assessment per term using diagnostic questions or in written form</p>  |

| Half term 5 - February   | Half term 6 - April   |
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| <p>To develop fluency, problem solving and reasoning skills across the 6 key areas of number, algebra, geometry and measures, statistics, probability and ratio and proportion</p> <p>Number:-Multiples, Factors, Primes</p> <ul style="list-style-type: none"> <li>To be secure in timestables (P)</li> <li>To understand and find multiple and factors. (P)</li> <li>Understand, know and recall prime numbers up to 30. (P)</li> <li>Be able to find the HCF and LCM of two or more numbers.</li> <li>Be able to express a number as a product of its Prime factors.</li> <li>Apply HCF and LCM to worded questions.</li> <li>To be able to use Venn diagrams to find the HCF and LCM</li> </ul> <p>Algebra - Coordinates, Straight Line Graphs</p> <ul style="list-style-type: none"> <li>Be able to plot and read co-ordinates in the first quadrant. (P)</li> <li>Be able to plot and read co-ordinates in all 4 quadrants.</li> <li>Discovery of straight line graphs using Geogebra or Desmos (laptops required)</li> <li>Be able to recognise and draw lines in the form <math>y=3</math>, <math>x=2</math>, <math>y = x</math> and <math>y = -x</math>.</li> <li>Be able to plot simple linear graphs from a table of results, in the form <math>y = mx + c</math></li> <li>To be able to find the gradient of a straight line</li> <li>To identify the equation of a straight line graph</li> <li>Discovery of quadratic graphs using Geogebra or Desmos (laptops required)</li> </ul> <p>Geometry and Surface Area</p> <ul style="list-style-type: none"> <li>To calculate area of 2D Shapes (P)</li> <li>To be able to draw 3D shapes on isometric paper.</li> <li>To be able to draw the net of a cuboid and other simple 3D shapes.</li> <li>To be able to find the surface area of cubes</li> <li>To be able to find the surface area of cuboids</li> <li>To find the surface area of triangular prisms (given the slanted length)</li> <li>To find the surface area of cylinder</li> <li>Find the missing length of the shape, given the surface area</li> </ul> <p>Number - Decimals – Add, subtract, multiply, divide and round</p> <ul style="list-style-type: none"> <li>To multiply and divide decimals by 10, 100, 1000 etc (P)</li> <li>To add and subtract decimals with more than two decimal places (P)</li> <li>To multiply and divide decimals by whole numbers</li> <li>To multiply and divide decimals by decimals</li> <li>Write down the place value of a decimal digit such as the value of 3 in 0.63 (P)</li> <li>Order decimals to find the biggest and the smallest (P)</li> <li>Round to the nearest integer (P)</li> <li>Round numbers to given powers of ten and to a given number of decimal places (P)</li> <li>Round a number to one significant figure and to any significant figures</li> </ul> | <p>To develop fluency, problem solving and reasoning skills across the 6 key areas of number, algebra, geometry and measures, statistics, probability and ratio and proportion</p> <p>Geometry and Measure - Volume</p> <ul style="list-style-type: none"> <li>To be secure in timestables, calculator methods and the four operations (P)</li> <li>To find the volume of cubes and cuboids</li> <li>To find the volume of simple prisms, eg triangular prisms etc</li> <li>To find missing lengths given the volume</li> <li>Find the volume of cylinders and composite shaped prisms</li> </ul> <p>Geometry and Measure - Angles</p> <ul style="list-style-type: none"> <li>Know and be able to use the points of a compass (NESW) (P)</li> <li>Be able to recognise and name acute, obtuse and reflex angles (P)</li> <li>Understand that angles on a straight line and in a triangle are 180o and angles around a point are 360o</li> <li>Find missing angles in right angles, angles on a straight line and angles around a point</li> <li>Understand that angles in a triangle add up to 180 o and angles in a quadrilateral add up to 360o</li> <li>Find missing angles in a triangle and quadrilateral</li> <li>Angle properties of intersecting and parallel straight lines.</li> </ul> <p>Ratio, Proportion and Rates of Change - Ratio</p> <ul style="list-style-type: none"> <li>To find missing parts in ratio problems using Bar Modelling (see 5 part lesson powerpoint and worksheets)</li> </ul> <p>Statistics - Graphs and Charts</p> <ul style="list-style-type: none"> <li>To be able to collect and record data including tally charts and frequency tables.(P)</li> <li>To be able to construct and use pictograms, bar charts and simple grouped frequency tables.</li> <li>To interpret graphs and diagrams, drawing conclusions.</li> <li>To collect and record data using grouped frequency table.</li> <li>To understand the different types of data, including discrete, continuous, quantitative and qualitative.</li> <li>To collect and record continuous data, choosing appropriate equal class intervals in grouped frequency tables.</li> </ul> |
| <p>Multiples<br/>Factors<br/>Primes<br/>HCF<br/>LCM<br/>Co-ordinates<br/>Linear<br/>Equation<br/>Expression<br/>Quadratic<br/>Cuboid<br/>Cylinder<br/>Prism<br/>Net<br/>Surface area</p>   | <p>Volume<br/>Cylinder<br/>Composite shape<br/>Compass<br/>Acute<br/>Obtuse<br/>Reflex<br/>Quadrilateral<br/>Parallel<br/>Perpendicular<br/>Ratio<br/>simplify</p>  |
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