

Year 7 Mathematics					
	Embarking	Emerging	Developing	Securing	Mastering
<b>Number</b>	<ul style="list-style-type: none"> <li>Secure knowledge value of place value in different context.</li> <li>Confidently apply four operations to solve problems.</li> <li>Develop efficient written methods for number.</li> <li>Round whole numbers to the nearest 10, 100 and 1000.</li> <li>Understand and use fraction notation.</li> <li>Use the “less and greater than” symbols.</li> </ul>	<ul style="list-style-type: none"> <li>Develop efficient methods with fractions and decimals.</li> <li>Confident use of four operations in worded problems.</li> <li>Recognise odd and even numbers.</li> <li>Use written methods to multiply and divide 3 digit numbers by a single digit number.</li> <li>Understand and use inverse operations.</li> <li>Read, write and order integers up to and including 4 digit numbers</li> <li>Understand and use decimal notation and place value.</li> </ul>	<ul style="list-style-type: none"> <li>Order and subtract positive and negative integers in context.</li> <li>Round decimals to the nearest integer.</li> <li>Round decimals to given decimal places confidently.</li> <li>Add and subtract decimals, including those with differing number of decimal places.</li> <li>Use a calculator to calculate square and cube roots.</li> <li>List and simplify equivalent fractions.</li> <li>Convert between fractions, decimals and percentages.</li> <li>Calculate percentage of amounts.</li> <li>Identify and calculate highest common factors and lowest common multiples in contexts.</li> <li>Express one number as a fraction of another.</li> </ul>	<ul style="list-style-type: none"> <li>Rounding decimals one and two places confidently.</li> <li>Use efficient methods with fractions.</li> <li>Round to a given significant figures.</li> <li>Multiply and divide integers by 0.1 and 0.01.</li> <li>Multiply and divide decimals.</li> <li>Convert integers to standard form.</li> <li>Use positive and negative square roots, cube and cube roots.</li> <li>Used index notations for small positive integer powers.</li> <li>Write and integer as a product of prime factors.</li> <li>Multiply integers by fractions.</li> <li>Add and subtract fractions by converting one fractions.</li> <li>Order decimals including those which have different decimal places.</li> <li>Use inequality signs to show comparisons between two fractions, or decimals.</li> <li>Calculate percentage of amounts using multipliers.</li> <li>Solve reverse percentages.</li> </ul>	<ul style="list-style-type: none"> <li>Round decimals to any given accuracy.</li> <li>Recognise equivalences and perform calculations with powers of 10.</li> <li>Recall from memory the cubes of 1, 2, 3, 4, 5, . . .</li> <li>Know the laws of indices.</li> <li>Calculate LCM and HCF using Venn diagrams.</li> <li>Convert between ordinary numbers and numbers in standard form.</li> <li>Add, subtract, multiply and divide numbers that are written in standard form.</li> <li>Divide any integer by a decimal by converting to division by an integer.</li> <li>Understand the term reciprocal and calculate reciprocals of any integer, decimal or fraction.</li> <li>Calculate percentage increase and decrease.</li> <li>Convert simple fractions into recurring decimals using bus-stop method.</li> <li>Calculate simple interest.</li> </ul>
<b>Geometry and Measure</b>	<ul style="list-style-type: none"> <li>Know and use simple formula to calculate area and perimeter.</li> <li>Use correct vocabulary, notation and labelling conventions for lines, angles and shapes.</li> <li>Name the different angles; acute, obtuse, right-angled and reflex.</li> </ul>	<ul style="list-style-type: none"> <li>Know the definition of regular and irregular polygons.</li> <li>Know the names of regular and irregular polygons.</li> <li>Understand the definition of parallel and perpendicular lines.</li> <li>Understand the properties of different quadrilaterals and triangles.</li> <li>Understand the definition of line of symmetry and rotational symmetry.</li> </ul>	<ul style="list-style-type: none"> <li>Identify and calculate angles on a straight line, around a point and vertically opposite.</li> <li>Measure and draw angles to nearest degree.</li> <li>Construct a triangle given sides and angles.</li> <li>Identify properties of 3D shapes.</li> <li>Identify and construct nets of common 3D shapes.</li> <li>Draw plans and elevations of 3D shapes.</li> <li>Reflect, translate and rotate shapes.</li> <li>Classify quadrilaterals and triangles given their properties.</li> </ul>	<ul style="list-style-type: none"> <li>Calculate volume of prisms.</li> <li>Calculate the surface area of prisms.</li> <li>Calculate the area of a trapezium.</li> <li>Calculate the circumference and area of a circle.</li> <li>Identify and calculate angles in parallel lines: Alternate, corresponding and allied angles.</li> <li>Calculate angles in isosceles and equilateral triangles.</li> <li>Draw and find bearings.</li> <li>Describe rotations, translations and reflections.</li> <li>Identify congruent shapes.</li> </ul>	<ul style="list-style-type: none"> <li>Construct triangles accurately given SSA, ASA, SAS.</li> <li>Use ruler and compass to bisect an angle.</li> <li>Construct perpendicular lines.</li> <li>Enlarge any shape given a positive scale factor.</li> <li>Describe a rotation, reflection and translation on a co-ordinate grid.</li> <li>Calculate the circumference and area of a semi-circle and quarter of a circle.</li> <li>Calculate missing lengths using Pythagoras’ Theorem.</li> <li>Calculate interior, exterior and the sum of angles in a polygon.</li> </ul>

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<b>Statistics and Probability</b>	<ul style="list-style-type: none"> <li>Collect discrete data and record results using frequency table.</li> <li>Draw bar chart for discrete data.</li> <li>Calculate total population from bar chart.</li> <li>Use the mode and range to describe sets of data.</li> <li>Read information and work out totals from pictogram.</li> </ul>	<ul style="list-style-type: none"> <li>Represent information on pictograms.</li> <li>Discuss events using words such as likely, unlikely, certain and impossible.</li> <li>Place probability events on a scale from impossible to certain.</li> <li>Find probabilities based on equally likely outcomes in simple contexts.</li> <li>List all outcomes for a single event systematically.</li> </ul>	<ul style="list-style-type: none"> <li>Draw and interpret frequency diagrams for discrete and continuous data.</li> <li>Calculate the mode, median, mean and the range from a set of data.</li> <li>Draw and interpret line graphs.</li> <li>Understand and use probability scale from 0 to 1.</li> <li>Write probabilities in words or fractions, decimals and percentages.</li> <li>Calculate the probability of an event happening using theoretical probability.</li> <li>List all outcomes using dice, spinners and coins.</li> <li>Calculate the probability of an event happening using relative frequency.</li> </ul>	<ul style="list-style-type: none"> <li>Draw and interpret scatter graphs including line of best fit.</li> <li>Calculate modal class from grouped data.</li> <li>Plan and construct two-way tables.</li> <li>Understand that the sum of probabilities of all mutually exclusive outcomes is 1.</li> <li>List all outcomes systematically.</li> <li>Draw sample space diagrams for two events.</li> <li>Add simple probabilities.</li> <li>Estimate the number of times an event will occur.</li> <li>Interpret results of an experiment using the language of probability.</li> <li>Compare estimated experimental probabilities with theoretical probability.</li> <li>Work out probabilities from Venn diagram.</li> </ul>	<ul style="list-style-type: none"> <li>Apply and work out the fraction of each sector on a pie chart.</li> <li>Draw and interpret distance-time graph.</li> <li>Calculate averages from frequency tables.</li> <li>Use 1-p to calculate the probability of an event not occurring.</li> <li>Calculate a missing probability from a list or table including algebraic terms.</li> <li>Use numerical scale from 0 to 1 to express and compare experimental and theoretical probabilities in a range of context.</li> <li>Compare relative frequencies from samples of different sizes.</li> <li>Complete Venn diagrams and use union and intersection.</li> </ul>
<b>Algebra</b>	<ul style="list-style-type: none"> <li>Write and plot coordinates in the positive quadrant.</li> <li>Express simple functions in words.</li> </ul>	<ul style="list-style-type: none"> <li>Understand the relationship between number and algebra.</li> <li>Multiply and divide basic algebra.</li> <li>Write expressions using algebraic notation (eg. I think of a number times it by 2 and add 5).</li> </ul>	<ul style="list-style-type: none"> <li>Plot coordinates in all four quadrants.</li> <li>Identify expressions, terms, equations and formulae.</li> <li>Multiply terms including single brackets by a positive integer.</li> <li>Calculate term-to-term rule and continue a sequence.</li> <li>Generate sequence from patterns.</li> <li>Show inequalities on a number line.</li> <li>Give numbers that satisfy inequalities.</li> <li>Calculate the input and output of function machine (positive integers only).</li> </ul>	<ul style="list-style-type: none"> <li>Expand, factorise and simplify a single bracket.</li> <li>Substitute positive and negative integers into expressions and formula.</li> <li>Calculate input and output from function machines, including negatives.</li> <li>Generate a sequence from the <math>n^{\text{th}}</math> term.</li> <li>Calculate the <math>n^{\text{th}}</math> term.</li> <li>Know the first five triangular numbers and to be able to continue the sequence.</li> <li>Calculate the mid-point of a line on a coordinate grid.</li> <li>Solve problems involving shapes on coordinates grid.</li> <li>Plot equations of line in form <math>y = mx + c</math> and identify the gradient.</li> </ul>	<ul style="list-style-type: none"> <li>Expand and simplify brackets including with negative numbers (eg. <math>3(x+4) - (x+5)</math>).</li> <li>Construct and solve linear equations, including unknowns on both sides.</li> <li>Construct, use and rearrange simple formulae.</li> <li>Plot and solve inequalities on a number line.</li> <li>Solve simultaneous equations graphically.</li> <li>Identify and continue the Fibonacci sequence.</li> <li>Add and subtract simple algebraic fractions.</li> <li>Plot quadratic functions with and without a calculator.</li> </ul>

<b>Ratio and Proportion</b>	<ul style="list-style-type: none"> <li>• Convert fractions into ratios.</li> <li>• Write ratios in their simplest terms.</li> <li>• Solve simple problems involving direct proportion.</li> </ul>	<ul style="list-style-type: none"> <li>• Convert between metric units.</li> <li>• Write and interpret a ratio given a diagram or context.</li> </ul>	<ul style="list-style-type: none"> <li>• Solve proportion problems using unitary method.</li> <li>• Compare products to work out best buy using simple proportion.</li> <li>• Calculate speed, distance and time given situations.</li> <li>• Solve ratio problems involving recipes.</li> </ul>	<ul style="list-style-type: none"> <li>• Convert between miles and kilometres.</li> <li>• Convert between imperial units and currencies when conversions are given.</li> <li>• Share amount in a given ratio.</li> <li>• Use ratio to compare scale drawing to real life.</li> <li>• Use equivalent fractions/decimals and percentages to compare proportions.</li> <li>• Express a number as a percentage of another.</li> </ul>	<ul style="list-style-type: none"> <li>• Calculate density, mass and volume, speed, time and distance.</li> <li>• Calculate the linear scale factor of similar shapes.</li> <li>• Use proportional reasoning to compare proportion.</li> <li>• Compare two ratios.</li> <li>• Calculate the percentage increase and decrease.</li> </ul>
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