

GCSE Maths**3 to 4/5 Topic List - FOUNDATION**

Red	✓
Amber	✓✓
Green	✓✓✓

		Before	After
Term 1 – First Half			
Add, subtract, multiply, divide N1, N2, N3	+ , - , x , ÷ whole numbers + , - , x , ÷ negatives + , - , x , ÷ decimals Solve a problem involving division by a decimal (up to 2 dp)		
Order numbers N1, N2	Put in order of size, integers, decimals and fractions		
Factors, multiples and primes N4, N5, N6	Understand the terms; Odd and even Factor Multiple Common factor Prime number Express a number as a product of prime factors (factor tree) Find the highest common factor (HCF) or the lowest common multiple (LCM) of two numbers.		
Squares, square roots, cubes and cube roots N3, N6, N7	Know all the square numbers from $2^2 = 4$ up to $15^2 = 225$ Know all the cube numbers from $2^3 = 8$ up to $5^3 = 125$ and also $10^3 = 1000$ Find squares and cubes Find square roots and cube roots		
Index notation N2, N3, N7	Use index notation for squares and cubes, eg. 5^3 Use index notation for powers of 10, eg. 10^6		
Index laws N2, N3, N7	Multiply and divide by adding or subtracting indices		

		Before	After
Fractions N10, N11, N12	Find equivalent fractions Simplify a fraction to its simplest form Convert between improper fractions and mixed numbers Add and subtract fractions Know the fraction-to-decimal conversion of familiar fractions		
Decimals N10	Know fraction to decimal conversions for simple fractions		
Percentages	Understand percentages Convert between fractions, decimals and percentages		
Using fractions, decimals and percentages R3, R9, N10, N12	Find a fraction of a quantity Find a percentage of a quantity Percentage increase Use decimals to find quantities Use a multiplier to increase or decrease a quantity (eg. use $\times 1.05$ to increase by 5%, or 0.88 to decrease by 12%)		
Fractions, decimals and percentages R3, N12	Find one number as a fraction of another number Find one number as a percentage of another number		
Number operations and the relationships between them N1, N2, N3	Understand multiplying and dividing, and that one is the inverse of the other Understand the hierarchy of operations (BIDMAS) Understand and use 1 over a number is the inverse of multiplying by that number		
Rounding and approximation N14, N15, N16	Round to a number of decimal places Round to a number of significant figures Estimate the answer to a calculation by using rounding		
Use a calculator effectively N7	Simple and complex calculations, including involving time or money Understand that rounding too early can cause inaccuracy		

		Before	After
<p>Angles on intersecting lines, in triangles and quadrilaterals, and on parallel lines</p> <p>G1, G3,</p>	<p>Understand acute, obtuse, reflex and right angles</p> <p>Know the properties of scalene, isosceles, equilateral and right-angled triangles</p> <p>Corresponding angles (in parallel lines)</p> <p>Alternate angles (in parallel lines)</p> <p>Calculate angles and give reasons</p> <p>Use the angles a quadrilateral add up to 360° to find missing angles</p>		
<p>Interior and exterior angles of polygons</p> <p>G3, G4</p>	<p>Calculate the sum of interior angles in a polygon</p> <p>Understand the polygon names; pentagon, hexagon, heptagon, octagon and decagon</p> <p>Calculate and use the sum of the interior angles of a polygon</p> <p>Understand and use fact that the exterior angles of a polygon add up to 360°</p> <p>Be able to deduce the number of sides of a regular polygon, given one of its angles</p> <p>Understand tessellations of regular and irregular polygons</p>		
<p>Properties of quadrilaterals</p> <p>G6, G4</p>	<p>Remember the definitions and properties (including equal sides, equal angles, parallel sides, lines of symmetry, etc.) of special quadrilaterals, ie.</p> <p style="padding-left: 40px;">Square</p> <p style="padding-left: 40px;">Rectangle</p> <p style="padding-left: 40px;">Parallelogram</p> <p style="padding-left: 40px;">Trapezium</p> <p style="padding-left: 40px;">Rhombus</p> <p style="padding-left: 40px;">Kite</p>		
Target		Achieved	

		Before	After
Algebraic notation A1, A3	Understand the difference between "expression", "formula" and "equation"		
Manipulate algebraic expressions A1, A4,	Multiply out a single bracket Factorise a single bracket by taking out a common factor		
Using formulae A2, A5	Substitute numbers (positive or negative) into a formula Change the subject of a simple formula		
Solve linear inequalities A17, A22	Use inequality signs correctly ($<$, $>$, \leq , \geq) Solve a simple linear inequality with one variable Show the solution to a linear inequality on a number line		
Ratio R4, R5, R6, R7	Write a ratio in its simplest form Divide a quantity in a given ratio Solve problems using ratios		
Nth term of a sequence A25	Find the nth term expression for a sequence Use the nth term expression to find a particular number in the sequence (eg. the 20th term)		
Perimeter and area/Volume N14, R1, G1, G14, G16, G17	Find the perimeter of a rectangle or triangle Use a formula to find the area of a triangle Use a formula to find the area of a parallelogram Use a formula to find the area of a trapezium Calculate the perimeter and area/volume of compound shapes made from triangles, rectangles and other shapes Find the surface area of shapes such as prisms or pyramids by using the formulae for triangles, rectangles and other shapes		
Estimates of probability and relative frequency P3, P1	Find probabilities of events using dice, spinners, coins Understand and use relative frequency as estimates of probability Calculate an estimate of how many times an event will occur, given its probability and the number of trials		

		Before	After
Listing events P1, P2, P3	List the outcomes for one or two events Use and draw diagrams to show all possibilities		
Mutually exclusive outcomes P4	Add simple probabilities Understand that the sum of all the mutually exclusive outcomes is 1		
Experimental and theoretical probability P1, P3	Compare experimental data with theoretical probability Understand that the same experiment repeated can have different results, and that increasing sample size increases accuracy		
Target		Achieved	

		Before	After
Term 2 – First Half			
Sequences A23, A25	Generate number sequences from diagrams Describe the rule for a number sequence (eg. subtract 3) Find a particular term in a sequence, or explain why a particular number is not in a sequence		
Coordinates G11	Use axes and coordinates, both positive and negative Find the coordinates of the mid-point of a line		
Graphs A8, A9	Plot straight line graphs from their equations Plot and draw a graph of an equation in the form $y = mx + c$ Find the gradient of a straight line graph		
Real life graphs A14, S2, S6 Solve quadratic equations by factorising A18	Use real life graphs: eg telephone tariffs, currency conversion Use distance-time graphs Solve quadratic equations algebraically by factorising Find approximate solutions by a graph		
Pythagoras G9	Understand and use Pythagoras' theorem in triangles		
Parts of a circle G9	Draw a circle with compasses, given either the diameter or radius Understand and remember parts of a circle: Radius Diameter Chord Circumference Tangent Arc Sector Segment		

Bearings G15	Use 3 figure bearings to describe a direction Mark a point on a diagram, given a bearing and distance from another point Measure a bearing on a map or scale plan Given a bearing of one point from another, find the bearing of the first point from the second		
Compound measures N13, R1	Understand and use compound measures, including speed and density		
Data handling S2	Decide on what data and analysis may be required for a problem Data collection Presenting data Discuss data		
Sampling S1, S5, P5	Understand how samples might be biased Discuss types and benefits of sampling How to collect random sample		
Stratified sampling S1, S5, P5	How to calculate a stratified sample.		
Design data collection methods S2	Design a data collection sheet, including one for continuous data Sort and classify data, and put data into a table		
Two-way tables S2	Design two-way tables Use information to complete a two-way table		
Charts and diagrams S4, S5, S6	Draw the following charts or diagrams Pie chart Histogram (with equal class intervals) Frequency polygon Line graph Scatter graph Frequency polygon for grouped data Stem and leaf diagram Time Series graph		

<p>Types of average and range S4</p>	<p>Calculate the following Mean, mode, median and range Estimate the mean of grouped data in a frequency table (mid-points) Find the median for grouped data Estimate the mean for grouped data</p>		
<p>Lines of best fit S6</p>	<p>Draw a line of best fit Understand positive, negative and no correlation Understand that correlation doesn't necessarily mean one variable is the cause of the other one</p>		
<p>Comparing data S4</p>	<p>Compare two sets of data using mean and range Compare two pie charts, and understand that the sizes represented in each depend on the total represented by each Understand the advantages and disadvantages of different averages</p>		
<p>Target</p>		<p>Achieved</p>	

Term 3 – First Half

<p>Venn Diagram P6</p>	<p>Reasons for Venn Diagrams Symbols used in Venn Diagrams Can construct a Venn Diagram</p>		
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<p>Vectors</p> <p>G24, G25</p>	<p>Describe translations as 2D vectors</p> <p>Apply addition and subtraction of vectors</p> <p>Multiplication of vectors by a scalar</p>		
<p>Trigonometry</p> <p>G21, N7, N15</p>	<p>Know formula for trigonometric ratios SOH, CAH, TOA</p> <p>Evaluate whether to subtract or add depending on side of triangle</p>		
<p>Curved graphs</p> <p>A12</p>	<p>Plot graphs of quadratic functions</p>		
<p>Congruence and similarity</p> <p>G6, G7</p>	<p>Understand what congruent means</p> <p>Understand what similar means</p>		
<p>Simultaneous equations</p> <p>A19</p>	<p>Solve two simultaneous equations in two variables</p>		
<p>Tree Diagrams</p> <p>P6, P7, P8</p>	<p>Produce tree diagram to show independent events</p> <p>Record all possible outcomes of two or more events as a frequency tree</p>		
Target		Achieved	