

Co-op Academy North Manchester - Year 9 Maths Curriculum

Y9	HT1	HT2	HT3	HT4	HT5	HT6
Topic(s)	1) FDP review 2) Probability 3) Sets and Venns	4 & 5) Solving linear simultaneous equations algebraically/ graphically	6) Angle review 7) Constructions congruence and loci 8) Pythagoras Theorem	9) Ratio review 10) Similarity and enlargement 11) Trigonometry	12) Algebra Review 13) Quadratic expressions and equations	14) Surds 15) Indices
Substantive Knowledge (Know That...)	<ul style="list-style-type: none"> <li>- To know that there are connections between methods of calculation for fractions, decimals and percentage.</li> <li>- To know that probability is a numerical measure of chance from 0 to 1 inclusive.</li> <li>- To know that we can represent combined events in a variety of ways.</li> <li>- To know that there is a difference between theoretical and experimental probability.</li> <li>- To know that we use set notation for intersections, unions, complements and the universal set.</li> <li>- To know that we can use set notation and Venn diagrams to find a probability.</li> </ul>	<ul style="list-style-type: none"> <li>- To know that equivalence can be maintained while scaling and rearranging equations.</li> <li>- To know that addition and subtraction of simultaneous equations can result in the elimination of a variable.</li> <li>- To know that substitution can be used to manipulate algebra.</li> <li>- To know that coordinates are solutions to linear equations, including intersections as simultaneous solutions.</li> <li>- To know that parallel lines have no solution as they do not intersect.</li> </ul>	<ul style="list-style-type: none"> <li>- To know that angle theorems are used to calculate angles without the need to measure.</li> <li>- To know that circles can be used to draw the locus of points that are a given distance from a point.</li> <li>- To know that there are congruence conditions for triangles.</li> <li>- To know that radical notation can be used to describe slanted non-integer lengths and how this relates to squares and right-angled triangles.</li> <li>- To know that perpendicular lines are often an opportunity to use Pythagoras' theorem.</li> </ul>	<ul style="list-style-type: none"> <li>- To know that ratios describe proportional relationships.</li> <li>- To know that angles do not change and proportions remain constant in similar shapes.</li> <li>- To know that the constant of proportionality is a relationship within a shape and the scale factor is a relationship between shapes.</li> <li>- To know that the centre of enlargement (CoE) determines the position of an enlarged shape.</li> <li>- To know that every right-angled triangle is similar to a right-angled triangle drawn within a unit circle.</li> <li>- To know that the relationship between the opposite and adjacent is held constant by a set angle.</li> </ul>	<ul style="list-style-type: none"> <li>- To know that there are key algebraic conventions.</li> <li>- To know that a variable can take any value whilst an unknown has a fixed value (or values).</li> <li>- To know that quadratics are expressions and equations that include a squared variable (and no higher order power).</li> <li>- To know that the shape of a quadratic graph is different from a linear graph.</li> <li>- To know that quadratic graphs can be used to give us information about x and y values.</li> <li>- To know that every x-value can be mapped to a single y-value but not the other way around.</li> <li>- To know that quadratics can be written in a factorised form, expressed as two brackets.</li> <li>- To know that</li> </ul>	<ul style="list-style-type: none"> <li>- To know that we have specific notation for surds.</li> <li>- To know that index notation is a way of representing how many times a base has been multiplied by itself.</li> <li>- To know that we can expand our understanding on indices to integers less than 1.</li> <li>- To know that there are 3 main index laws (multiplication, division, and powers).</li> <li>- To know that with standard form we represent numbers in the form <math>a \times 10^b</math> where <math>1 \leq a &lt; 10</math> and b is an integer.</li> <li>- To know that repeated percentage change results in a different amount of change each iteration.</li> </ul>

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					expanding brackets is a multiplication of two partitioned numbers and use models of multiplication to find quadratics and other polynomials in their standard form.	
Disciplinary Knowledge (Know How...)	<ul style="list-style-type: none"> <li>- To know how to apply the four operations to fractions, decimals and percentages.</li> <li>- To know how to calculate the probability of single independent events.</li> <li>- To know how to calculate the probability of a pair of combined events.</li> <li>- To know how to determine whether an experiment is fair or biased.</li> <li>- To know how to identify and interpret sets described by notation and within Venn diagrams.</li> <li>- To know how to form and interpret Venn diagrams in the context of probability.</li> </ul>	<ul style="list-style-type: none"> <li>- To know how to solve and manipulate linear equations with one or more variables.</li> <li>- To know how to use equivalent equations, through scaling and rearranging, to solve simultaneous equations.</li> <li>- To know how to reduce the number of variables in an equation through substitution.</li> <li>- To know how to solve simultaneous linear equations graphically.</li> <li>- To know how to identify whether a pair of simultaneous equations have a solution algebraically and graphically.</li> </ul>	<ul style="list-style-type: none"> <li>- To know how to calculate angles using multiple angle theorems.</li> <li>- To know how to construct perpendicular and angle bisectors.</li> <li>- To know how to identify when two triangles are congruent.</li> <li>- To know how to find any missing length of a right-angled triangle by knowing that the square of the hypotenuse is equal to the sum of the squares of the other two sides.</li> <li>- To know how to identify opportunities to use Pythagoras's theorem in non-obvious contexts.</li> </ul>	<ul style="list-style-type: none"> <li>- To know how to describe proportional relationships using ratios and fractions.</li> <li>- To know how to find scale factors and constants of proportionality and use them to find missing side lengths.</li> <li>- To know how to enlarge a shape from a given CoE and on a coordinate grid and find the CoE.</li> <li>- To know how to find the length of catheti in right-angled triangles from a given angle and the length of the hypotenuse, including through using sine and cosine functions.</li> <li>- To know how to directly find the length of the opposite from the adjacent and given angle (and vice versa).</li> <li>- To know how to find any angle in a</li> </ul>	<ul style="list-style-type: none"> <li>- To know how to manipulate algebraic expressions by expanding brackets and simplifying or factorising.</li> <li>- To know how to evaluate expressions, solve single variable equations, and represent equations with 2 variables graphically.</li> <li>- To know how to evaluate quadratic expressions for a given value, and use these values to plot graphs of quadratic equations.</li> <li>- To know how to expand double brackets with x coefficients of 1 and positive constants.</li> <li>- To know how to expand double brackets including those with negatives and non-1 x coefficients.</li> </ul>	<ul style="list-style-type: none"> <li>- To know how to identify and begin to manipulate surds.</li> <li>- To know how to write numbers in index form in decimal and fractional forms.</li> <li>- To know how to simplify expressions involving indices with the same base</li> <li>- To know how to use the expanded form of indices to demonstrate the generalisations.</li> <li>- To know how to interpret numbers in standard form and convert between ordinary and standard forms.</li> <li>- To know how to use decimal multipliers to calculate change, forwards and backwards.</li> </ul>

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				right-angled triangle from two known side lengths.		
Key Concepts	Probability	Linear simultaneous equations	Geometry of triangles	Ratio and proportion	Quadratics	Reasoning with number
Assessment	Topic assessments at the end of each topic with individualised Progress Tasks following each assessment. Trust End of Year Assessment completed in HT6.					
Homework	Key Skills Homework set each week.					
Wider reading	'The Number Mysteries' - Marcus du Sautoy	'The Indisputable Existence of Santa Claus' - Dr Hannah Fry and Dr Thomas Oleron Evans	'Alex's Adventures in Numberland' - Alex Bellos	'The Math Book' - Clifford A. Pickover	'Mathematics Magic and Mystery' - Martin Gardner	'How Many Socks Make a Pair?' - Rob Eastaway
How to help at home	<p>The two sites below are fantastic resources for revision:</p> <ul style="list-style-type: none"> <li>- CorbettMaths is useful for topic-based practice, with videos, worksheets and exam-style questions for each topic - <a href="https://corbettmaths.com/contents/">https://corbettmaths.com/contents/</a></li> <li>- BBC Bitesize is another useful website that features clear examples, questions to try and also interactive games related to the given topic - <a href="https://www.bbc.co.uk/bitesize/subjects/zqhs34j">https://www.bbc.co.uk/bitesize/subjects/zqhs34j</a></li> <li>- Oak Academy features more 'lesson-style' topic resources with a video, followed by some questions to try and a quiz that is marked on the site - <a href="https://classroom.thenational.academy/subjects-by-key-stage/key-stage-3/subjects/maths">https://classroom.thenational.academy/subjects-by-key-stage/key-stage-3/subjects/maths</a></li> </ul>					