

Co-op Academy North Manchester - Year 7 Maths Curriculum

Y7	HT1	HT2	HT3	HT4	HT5	HT6
Topic(s)	1) Place Value 2) Properties of Arithmetic 3) Factors and Multiples 4) Order of Operations	5) Positive and negative numbers 6) Expressions equations and inequalities	7) Angles 8) Classifying 2D shapes 9) Constructing triangles and quadrilaterals	10) Coordinates 11) Area and perimeter of 2D shapes 12) Transforming 2D figures	13) Prime factorisation 14) Conceptualising and comparing fractions 15) Manipulating and calculating with fractions	15) Manipulating and calculating with fractions 16) Ratio and proportion 17) Percentages
Substantive Knowledge (Know That...)	<ul style="list-style-type: none"> - To know that we have conventions for place value for integers and decimals. - To know that each of the basic operations (+, -, \times and \div) have specific meanings. - To know that some operators are associative and some are not. - To know that a factor of a number is an integer that divides the number exactly. - To know that a multiple is the result of multiplying one number by an integer. - To know that a square number is the result of multiplying an integer by itself. - To know that a square number has an odd number of factors. - To know that a prime number has exactly two factors. - To know that there is an equal and unequal order of priority between addition, subtraction, multiplication and division. 	<ul style="list-style-type: none"> - To know that positive and negative numbers have different meanings. - To know that multiplying by a scale factor can alter the magnitude and the direction of the number. - To know that division and multiplication by negative numbers reverses the number's direction. - To know that there are connections between multiplication and division and deduce other known facts. - To know that algebra is used to express mathematical structures, and that algebraic terms represent numbers that are unknown or variable. - To know that an expression is a collection of algebraic terms. - To know that an equation is a mathematical statement that shows that two expressions are equal. 	<ul style="list-style-type: none"> - To know that an angle is a measure of turn. - To know that two parallel straight lines will never meet. - To know that two lines that are not parallel will meet exactly once. - To know that shapes have properties such as number of sides, number of equal sides, number of equal angles, and number of lines of symmetry. - To know that rotational symmetry means a shape can be turned to fit over itself exactly. - To know that circle properties can be used to reason about the properties of other shapes. - To know that triangle constructions can be extended to constructing quadrilaterals. 	<ul style="list-style-type: none"> - To know that coordinates are used to describe a position on a coordinate grid. - To know that gradient is the slope or 'steepness' of a line graph. - To know that for all points on the line $y=x$ the x-coordinate is the same as the y-coordinate. - To know that the formulae for the area of parallelograms and triangles involves the height perpendicular to a chosen base. - To know that translations and rotations preserve size and shape but not always orientation. - To know that there are key features and differences between rotation, reflection translation and enlargement. 	<ul style="list-style-type: none"> - To know that integers greater than 1 are either prime or can be made by multiplying primes in exactly one way. - To know that factors of a number can be calculated by multiplying combinations of its prime factors. - To know that the numerator and denominator have a role in describing numerical value. - To know that fractions with the same value can be written in different ways. - To know that fractions can be used as operators where the product is found by multiplying denominators and numerators. - To know that there are connections between equivalent and inverse operations when \times and \div by fractions. 	<ul style="list-style-type: none"> - To know that ratio tells us about proportion, not amounts. - To know that there is a relationship between parts and the whole when working with fractions and ratios together. - To know that percentages are a useful tool for comparing amounts.

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Disciplinary Knowledge (Know How...)	<ul style="list-style-type: none"> - To know how to exchange between place value columns. - To know how to use the commutative property to simplify calculations. - To know how to decompose numbers to simplify calculations. - To know how to find factors of 2, 3, 5 and 10. - To know how to list the factors of integers supported by appropriate representation. - To know how to interpret and write calculations involving the four operations, indices and brackets. 	<ul style="list-style-type: none"> - To know how to solve simple addition problems involving negative numbers. - To know how to subtract positive and negative numbers from positive and negative numbers. - To know how to multiply with negative numbers, including with the negative as a multiplier and multiplicand. - To know how to multiply and divide with negative numbers. - To know how to substitute (into), simplify, expand and factorise algebraic expressions. - To know how to manipulate equations and inequalities to form new equations and inequalities. - To know how to form expressions and inequalities in a new context. - To know how to simplify and manipulate algebra in a new context. 	<ul style="list-style-type: none"> - To know how to find missing angles at a point and on a line. - To know how to identify angles that are equal and pairs of angles that sum to 180 degrees using angle rules in parallel lines. - To know how to identify lines of symmetry. - To know how to name quadrilaterals accurately. - To know how to use ruler, protractor and pair of compasses to construct triangles. - To know how to use ruler and compasses to construct quadrilaterals. 	<ul style="list-style-type: none"> - To know how to read and plot coordinates on axes with different scales. - To know how to plot line graphs from a given relationships between the coordinates. - To know how to recognise and draw the lines $y=x$ and $y=-x$. - To know how to identify coordinates on the lines $y=x$ and $y=-x$. - To know how to work out the area and perimeter of rectilinear shapes, parallelograms and triangles. - To know how to transform a 2-D shape through translation and rotation. - To know how to reflect and enlarge shapes on a grid. 	<ul style="list-style-type: none"> - To know how to find the product of prime factors of a three digit composite number. - To know how to find the HCF and LCM from numbers written as products of their prime factors. - To know how to represent fractions pictorially and abstractly. - To know how to convert between fractions and decimals. - To know how to multiply integers and fractions by fractions - To know how to divide by fractions efficiently. 	<ul style="list-style-type: none"> - To know how to use and represent common denominators and the lowest common denominator. - To know how to add and subtract fractions. - To know how to simplify and scale ratios. - To know how to divide an amount into a ratio, identify the constant of proportionality and move between fractional and ratio written representations. - To know how to write a proportion as a percentage, convert between fraction, decimals and percentage and mentally calculate percentages of amounts. - To know how to work out percentages of amounts and percentage increase and decrease (including through the use of multipliers).
Key Concepts	Making generalisations about the number system 1	Making generalisations about the number system 2	2-D Geometry	The Cartesian Plane	Fractions	Ratio and Proportion

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Assessment	Topic assessments at the end of each topic with individualised Progress Tasks following each assessment. Academy End of Year Assessment completed in HT6.					
Homework	Key Skills Homework set each week.					
Wider reading	'How Many Socks Make a Pair?' - Rob Eastaway	'The Indisputable Existence of Santa Claus' - Dr Hannah Fry and Dr Thomas Oleron Evans	'The Time and Space of Uncle Albert' - Russell Stannard	'Can You Solve My Problems?' Alex Bellos	'How To Cut a Cake and Other Mathematical Conundrums' - Ian Stewart	'Snowflake, Seashell, Star' - Alex Bellos
How to help at home	<p>The two sites below are fantastic resources for revision:</p> <ul style="list-style-type: none"> - CorbettMaths is useful for topic-based practice, with videos, worksheets and exam-style questions for each topic - https://corbettmaths.com/contents/ - BBC Bitesize is another useful website that features clear examples, questions to try and also interactive games related to the given topic - https://www.bbc.co.uk/bitesize/subjects/zqhs34j - 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 - https://classroom.thenational.academy/subjects-by-key-stage/key-stage-3/subjects/math 					