

## Maths Key Stage 3 Outline

	Enhancing		
	Secure		<ul style="list-style-type: none"> <li>• Apply the four operations with negative numbers</li> <li>• Convert numbers into standard form and vice versa</li> <li>• Apply the multiplication, division and power laws of indices</li> <li>• Convert between terminating decimals and fractions</li> <li>• Find a relevant multiplier when solving problems involving proportion</li> <li>• Solve problems involving percentage change, including original value problems</li> <li>• Factorise an expression by taking out common factors</li> <li>• Change the subject of a formula when two steps are required</li> <li>• Find and use the nth term for a linear sequence</li> <li>• Solve linear equations with unknowns on both sides</li> <li>• Plot and interpret graphs of linear functions</li> <li>• Apply the formulae for circumference and area of a circle</li> <li>• Calculate theoretical probabilities for single events</li> </ul>
5	Developing		<ul style="list-style-type: none"> <li>• Know how to write a number as a product of its prime factors</li> <li>• Know how to round to significant figures</li> <li>• Know the order of operations including powers</li> <li>• Know how to enter negative numbers into a calculator</li> <li>• Know that <math>a^0 = 1</math></li> <li>• Know percentage and decimal equivalents for fractions with a denominator of 3, 5, 8 and 10</li> <li>• Know the characteristic shape of a graph of a quadratic function</li> <li>• Know how to measure and write bearings</li> <li>• Know how to identify alternate angles</li> <li>• Know how to identify corresponding angles</li> <li>• Know how to find the angle sum of any polygon</li> <li>• Know that circumference = <math>2\pi r = \pi d</math></li> <li>• Know that area of a circle = <math>\pi r^2</math></li> <li>• Know that volume of prism = area of cross-section <math>\times</math> length</li> <li>• Know to use the midpoints of groups to estimate the mean of a set of grouped data</li> <li>• Know that probability is measured on a 0-1 scale</li> <li>• Know that the sum of all probabilities for a single event is 1</li> </ul>
4	Enhancing		

	Secure	<ul style="list-style-type: none"> <li>• Use positive integer powers and associated real roots</li> <li>• Apply the four operations with decimal numbers</li> <li>• Write a quantity as a fraction or percentage of another</li> <li>• Use multiplicative reasoning to interpret percentage change</li> <li>• Add, subtract, multiply and divide with fractions and mixed numbers</li> <li>• Check calculations using approximation, estimation or inverse operations</li> <li>• Simplify and manipulate expressions by collecting like terms</li> <li>• Simplify and manipulate expressions by multiplying a single term over a bracket</li> <li>• Substitute numbers into formulae</li> <li>• Solve linear equations in one unknown</li> <li>• Understand and use lines parallel to the axes, <math>y = x</math> and <math>y = -x</math></li> <li>• Calculate surface area of cubes and cuboids</li> <li>• Understand and use geometric notation for labelling angles, lengths, equal lengths and parallel lines</li> </ul>	<ul style="list-style-type: none"> <li>• Use positive integer powers and associated real roots</li> <li>• Apply the four operations with decimal numbers</li> <li>• Write a quantity as a fraction or percentage of another</li> <li>• Use multiplicative reasoning to interpret percentage change</li> <li>• Add, subtract, multiply and divide with fractions and mixed numbers</li> <li>• Check calculations using approximation, estimation or inverse operations</li> <li>• Simplify and manipulate expressions by collecting like terms</li> <li>• Simplify and manipulate expressions by multiplying a single term over a bracket</li> <li>• Substitute numbers into formulae</li> <li>• Solve linear equations in one unknown</li> <li>• Understand and use lines parallel to the axes, <math>y = x</math> and <math>y = -x</math></li> <li>• Calculate surface area of cubes and cuboids</li> <li>• Understand and use geometric notation for labelling angles, lengths, equal lengths and parallel lines</li> </ul>
	Developing	<ul style="list-style-type: none"> <li>• Know the first 6 cube numbers</li> <li>• Know the first 12 triangular numbers</li> <li>• Know the symbols <math>=</math>, <math>\neq</math>, <math>&lt;</math>, <math>&gt;</math>, <math>\leq</math>, <math>\geq</math></li> <li>• Know the order of operations including brackets</li> <li>• Know basic algebraic notation</li> <li>• Know that area of a rectangle = <math>l \times w</math></li> <li>• Know that area of a triangle = <math>b \times h \div 2</math></li> <li>• Know that area of a parallelogram = <math>b \times h</math></li> <li>• Know that area of a trapezium = <math>((a + b) \div 2) \times h</math></li> <li>• Know that volume of a cuboid = <math>l \times w \times h</math></li> <li>• Know the meaning of faces, edges and vertices</li> <li>• Know the names of special triangles and quadrilaterals</li> <li>• Know how to work out measures of central tendency</li> <li>• Know how to calculate the range</li> </ul>	<ul style="list-style-type: none"> <li>• Know the first 6 cube numbers</li> <li>• Know the first 12 triangular numbers</li> <li>• Know the symbols <math>=</math>, <math>\neq</math>, <math>&lt;</math>, <math>&gt;</math>, <math>\leq</math>, <math>\geq</math></li> <li>• Know the order of operations including brackets</li> <li>• Know basic algebraic notation</li> <li>• Know that area of a rectangle = <math>l \times w</math></li> <li>• Know that area of a triangle = <math>b \times h \div 2</math></li> <li>• Know that area of a parallelogram = <math>b \times h</math></li> <li>• Know that area of a trapezium = <math>((a + b) \div 2) \times h</math></li> <li>• Know that volume of a cuboid = <math>l \times w \times h</math></li> <li>• Know the meaning of faces, edges and vertices</li> <li>• Know the names of special triangles and quadrilaterals</li> <li>• Know how to work out measures of central tendency</li> <li>• Know how to calculate the range</li> </ul>
3	Enhancing		

	Secure	<ul style="list-style-type: none"> <li>• Multiply and divide numbers with up to three decimal places by 10, 100, and 1000</li> <li>• Use long division to divide numbers up to four digits by a two-digit number</li> <li>• Use simple formulae expressed in words</li> <li>• Generate and describe linear number sequences</li> <li>• Use simple ratio to compare quantities</li> <li>• Write a fraction in its lowest terms by cancelling common factors</li> <li>• Add and subtract fractions and mixed numbers with different denominators</li> <li>• Multiply pairs of fractions in simple cases</li> <li>• Find percentages of quantities</li> <li>• Solve missing angle problems involving triangles, quadrilaterals, angles at a point and angles on a straight line</li> <li>• Calculate the volume of cubes and cuboids</li> <li>• Use coordinates in all four quadrants</li> <li>• Calculate and interpret the mean as an average of a set of discrete data</li> </ul>	<ul style="list-style-type: none"> <li>• Multiply and divide numbers with up to three decimal places by 10, 100, and 1000</li> <li>• Use long division to divide numbers up to four digits by a two-digit number</li> <li>• Use simple formulae expressed in words</li> <li>• Generate and describe linear number sequences</li> <li>• Use simple ratio to compare quantities</li> <li>• Write a fraction in its lowest terms by cancelling common factors</li> <li>• Add and subtract fractions and mixed numbers with different denominators</li> <li>• Multiply pairs of fractions in simple cases</li> <li>• Find percentages of quantities</li> <li>• Solve missing angle problems involving triangles, quadrilaterals, angles at a point and angles on a straight line</li> <li>• Calculate the volume of cubes and cuboids</li> <li>• Use coordinates in all four quadrants</li> <li>• Calculate and interpret the mean as an average of a set of discrete data</li> </ul>
	Developing	<ul style="list-style-type: none"> <li>• Know percentage and decimal equivalents for fractions with a denominator of 2, 3, 4, 5, 8 and 10</li> <li>• Know the rough equivalence between miles and kilometres</li> <li>• Know that vertically opposite angles are equal</li> <li>• Know that the area of a triangle = base <math>\times</math> height <math>\div</math> 2</li> <li>• Know that the area of a parallelogram = base <math>\times</math> height</li> <li>• Know that volume is measured in cubes</li> <li>• Know the names of parts of a circle</li> <li>• Know that the diameter of a circle is twice the radius</li> <li>• Know the conventions for a 2D coordinate grid</li> <li>• Know that mean = sum of data <math>\div</math> number of pieces of data</li> </ul>	<ul style="list-style-type: none"> <li>• Know percentage and decimal equivalents for fractions with a denominator of 2, 3, 4, 5, 8 and 10</li> <li>• Know the rough equivalence between miles and kilometres</li> <li>• Know that vertically opposite angles are equal</li> <li>• Know that the area of a triangle = base <math>\times</math> height <math>\div</math> 2</li> <li>• Know that the area of a parallelogram = base <math>\times</math> height</li> <li>• Know that volume is measured in cubes</li> <li>• Know the names of parts of a circle</li> <li>• Know that the diameter of a circle is twice the radius</li> <li>• Know the conventions for a 2D coordinate grid</li> <li>• Know that mean = sum of data <math>\div</math> number of pieces of data</li> </ul>
2	Enhancing		

	Secure	<ul style="list-style-type: none"> <li>• Identify multiples and factors of a number</li> <li>• Count forwards and backwards through zero</li> <li>• Round to one decimal place</li> <li>• Use columnar addition and subtraction with numbers of any size</li> <li>• Multiply a three- or four-digit number by a two-digit number using long multiplication</li> <li>• Divide numbers up to four-digits by a single-digit number using short division and interpret the remainder</li> <li>• Add and subtract fractions with denominators that are multiples of the same number</li> <li>• Write decimals as fractions</li> <li>• Understand that per cent relates to number of parts per hundred</li> <li>• Convert between adjacent metric units of measure for length, capacity and mass</li> <li>• Measure and draw angles</li> <li>• Calculate the area of rectangles</li> <li>• Distinguish between regular and irregular polygons</li> </ul>	<ul style="list-style-type: none"> <li>• Identify multiples and factors of a number</li> <li>• Count forwards and backwards through zero</li> <li>• Round to one decimal place</li> <li>• Use columnar addition and subtraction with numbers of any size</li> <li>• Multiply a three- or four-digit number by a two-digit number using long multiplication</li> <li>• Divide numbers up to four-digits by a single-digit number using short division and interpret the remainder</li> <li>• Add and subtract fractions with denominators that are multiples of the same number</li> <li>• Write decimals as fractions</li> <li>• Understand that per cent relates to number of parts per hundred</li> <li>• Convert between adjacent metric units of measure for length, capacity and mass</li> <li>• Measure and draw angles</li> <li>• Calculate the area of rectangles</li> <li>• Distinguish between regular and irregular polygons</li> </ul>
	Developing	<ul style="list-style-type: none"> <li>• Know the place value headings up to millions</li> <li>• Recall primes to 19</li> <li>• Know the first 12 square numbers</li> <li>• Know the Roman numerals I, V, X, L, C, D, M</li> <li>• Know the % symbol</li> <li>• Know percentage and decimal equivalents for <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{5}</math>, <math>\frac{2}{5}</math>, <math>\frac{4}{5}</math></li> <li>• Know rough conversions between metric and Imperial units</li> <li>• Know that angles are measured in degrees</li> <li>• Know angles in one whole turn total <math>360^\circ</math></li> <li>• Know angles in half a turn total <math>180^\circ</math></li> <li>• Know that area of a rectangle = length <math>\times</math> width</li> </ul>	<ul style="list-style-type: none"> <li>• Know the place value headings up to millions</li> <li>• Recall primes to 19</li> <li>• Know the first 12 square numbers</li> <li>• Know the Roman numerals I, V, X, L, C, D, M</li> <li>• Know the % symbol</li> <li>• Know percentage and decimal equivalents for <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{1}{5}</math>, <math>\frac{2}{5}</math>, <math>\frac{4}{5}</math></li> <li>• Know rough conversions between metric and Imperial units</li> <li>• Know that angles are measured in degrees</li> <li>• Know angles in one whole turn total <math>360^\circ</math></li> <li>• Know angles in half a turn total <math>180^\circ</math></li> <li>• Know that area of a rectangle = length <math>\times</math> width</li> </ul>
1	Enhancing		

	Secure	<ul style="list-style-type: none"> <li>• Round any number to the nearest 10, 100, 1000 and round a number with one decimal place to the nearest whole number</li> <li>• Count backwards through zero</li> <li>• Use columnar addition and subtraction with numbers up to four digits</li> <li>• Multiply two- and three-digit numbers by a one-digit number</li> <li>• Use known and derived facts to multiply and divide mentally</li> <li>• Write any number of tenths or hundredths as a decimal</li> <li>• Find families of common equivalent fractions</li> <li>• Add and subtract fractions with the same denominator</li> <li>• Find areas of rectilinear shapes by counting squares</li> <li>• Use a line of symmetry to complete a symmetric shape or pattern</li> <li>• Identify lines of symmetry in 2D shapes</li> <li>• Use coordinates in the first quadrant</li> <li>• Interpret and construct bar charts and time graphs</li> </ul>	<ul style="list-style-type: none"> <li>• Round any number to the nearest 10, 100, 1000 and round a number with one decimal place to the nearest whole number</li> <li>• Count backwards through zero</li> <li>• Use columnar addition and subtraction with numbers up to four digits</li> <li>• Multiply two- and three-digit numbers by a one-digit number</li> <li>• Use known and derived facts to multiply and divide mentally</li> <li>• Write any number of tenths or hundredths as a decimal</li> <li>• Find families of common equivalent fractions</li> <li>• Add and subtract fractions with the same denominator</li> <li>• Find areas of rectilinear shapes by counting squares</li> <li>• Use a line of symmetry to complete a symmetric shape or pattern</li> <li>• Identify lines of symmetry in 2D shapes</li> <li>• Use coordinates in the first quadrant</li> <li>• Interpret and construct bar charts and time graphs</li> </ul>
	Developing	<ul style="list-style-type: none"> <li>• Know the place value headings of ones, tens, hundreds and thousands</li> <li>• Know the Roman numerals I, V, X, L, C</li> <li>• Know multiplication facts up to <math>12 \times 12</math></li> <li>• Know division facts related to tables up to <math>12 \times 12</math></li> <li>• Know decimals equivalents of <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{3}{4}</math></li> <li>• Know adjacent time facts involving years, months, weeks, days, hours, minutes and seconds</li> <li>• Know 12- and 24-hour clock conversions</li> <li>• Know the names and connected properties of triangles and quadrilaterals</li> <li>• Know the definitions of acute and obtuse angles</li> <li>• Know that area is measured in squares</li> <li>• Know that perimeter is a measure of length</li> </ul>	<ul style="list-style-type: none"> <li>• Know the place value headings of ones, tens, hundreds and thousands</li> <li>• Know the Roman numerals I, V, X, L, C</li> <li>• Know multiplication facts up to <math>12 \times 12</math></li> <li>• Know division facts related to tables up to <math>12 \times 12</math></li> <li>• Know decimals equivalents of <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, <math>\frac{3}{4}</math></li> <li>• Know adjacent time facts involving years, months, weeks, days, hours, minutes and seconds</li> <li>• Know 12- and 24-hour clock conversions</li> <li>• Know the names and connected properties of triangles and quadrilaterals</li> <li>• Know the definitions of acute and obtuse angles</li> <li>• Know that area is measured in squares</li> <li>• Know that perimeter is a measure of length</li> </ul>
Base	Enhancing		

	<ul style="list-style-type: none"> <li>• Read and write numbers up to 100 in numerals and in words</li> <li>• Compare and order whole numbers up to 100</li> <li>• Count from zero in multiples of 2, 3 and 5</li> <li>• Read and write numbers up to 1000 in numerals and in words</li> <li>• Compare and order whole numbers up to 1000</li> <li>• Count from zero in multiples of 4, 8, 50 and 100</li> <li>• Add and subtract numbers mentally including a three-digit number and ones, tens and hundreds</li> <li>• Use columnar addition and subtraction with numbers up to three digits</li> <li>• Use known facts to multiply and divide mentally within the 2, 3, 4, 8 and 10 multiplication tables</li> <li>• Multiply a two-digit number by a one-digit number</li> <li>• Understand fractions as proportions</li> <li>• Understand fractions as numbers</li> <li>• Count forward and backwards in tenths</li> <li>• Tell the time using analogue and digital 12-hour clocks</li> <li>• Measure length (mm, cm, m), mass (g, kg) and capacity (ml, l)</li> <li>• Measure perimeters of shapes</li> <li>• Count in tens from any number, forwards and backwards</li> <li>• Add and subtract numbers including a two-digit number and ones, a two-digit number and tens, two two-digit numbers, and three one-digit numbers</li> <li>• Derive addition and subtraction facts to 100 using known facts to 20</li> <li>• Write multiplication and division statements using correct symbols</li> <li>• Understand that addition and multiplication of two numbers can be done in any order (commutative) and subtraction and division cannot</li> <li>• Recognise and name the fractions <math>\frac{1}{3}</math>, <math>\frac{1}{4}</math>, <math>\frac{2}{4}</math>, <math>\frac{3}{4}</math></li> <li>• Tell the time to the nearest five minutes using an analogue clock, including 'quarter past' and 'quarter to'.</li> <li>• Use a ruler to measure lengths in millimetres and centimetres</li> <li>• Identify and describe 2D and 3D shapes</li> <li>• Use mathematical vocabulary to describe position, direction and movement</li> </ul>	<ul style="list-style-type: none"> <li>• Read and write numbers up to 100 in numerals and in words</li> <li>• Compare and order whole numbers up to 100</li> <li>• Count from zero in multiples of 2, 3 and 5</li> <li>• Read and write numbers up to 1000 in numerals and in words</li> <li>• Compare and order whole numbers up to 1000</li> <li>• Count from zero in multiples of 4, 8, 50 and 100</li> <li>• Add and subtract numbers mentally including a three-digit number and ones, tens and hundreds</li> <li>• Use columnar addition and subtraction with numbers up to three digits</li> <li>• Use known facts to multiply and divide mentally within the 2, 3, 4, 8 and 10 multiplication tables</li> <li>• Multiply a two-digit number by a one-digit number</li> <li>• Understand fractions as proportions</li> <li>• Understand fractions as numbers</li> <li>• Count forward and backwards in tenths</li> <li>• Tell the time using analogue and digital 12-hour clocks</li> <li>• Measure length (mm, cm, m), mass (g, kg) and capacity (ml, l)</li> <li>• Measure perimeters of shapes</li> <li>• Count in tens from any number, forwards and backwards</li> <li>• Add and subtract numbers including a two-digit number and ones, a two-digit number and tens, two two-digit numbers, and three one-digit numbers</li> <li>• Derive addition and subtraction facts to 100 using known facts to 20</li> <li>• Write multiplication and division statements using correct symbols</li> <li>• Understand that addition and multiplication of two numbers can be done in any order (commutative) and subtraction and division cannot</li> <li>• Recognise and name the fractions <math>\frac{1}{3}</math>, <math>\frac{1}{4}</math>, <math>\frac{2}{4}</math>, <math>\frac{3}{4}</math></li> <li>• Tell the time to the nearest five minutes using an analogue clock, including 'quarter past' and 'quarter to'.</li> <li>• Use a ruler to measure lengths in millimetres and centimetres</li> <li>• Identify and describe 2D and 3D shapes</li> <li>• Use mathematical vocabulary to describe position, direction and movement</li> </ul>
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Secure

	<p>Developing</p> <ul style="list-style-type: none"> <li>• Know the place value headings of ones and tens</li> <li>• Know that zero is a placeholder</li> <li>• Know the symbols =, &lt;, &gt;, ×, ÷ • Know the place value headings of tenths, ones, tens and hundreds</li> <li>• Know multiplication facts for the 3, 4 and 8 multiplication tables</li> <li>• Know division facts related to the 3, 4 and 8 multiplication tables</li> <li>• Know that a right angle is <math>\frac{1}{4}</math> of a turn</li> <li>• Know the number of days in each month</li> <li>• Know the number days in a year and a leap year</li> <li>• Know that 60 seconds = 1 minute</li> <li>• Know the Roman numerals from I to XII</li> <li>• Know the vocabulary of time including o'clock, a.m., p.m., morning afternoon, noon and midnight</li> <li>• Know the meaning of 'perimeter'</li> <li>• Know the meaning of odd and even numbers</li> <li>• Know doubles and halves up to 20</li> <li>• Know addition and subtraction facts to 20</li> <li>• Know multiplication facts for the 2, 5 and 10 multiplication tables</li> <li>• Know division facts related to the 2, 5 and 10 multiplication tables</li> <li>• Know that 60 minutes = 1 hour</li> <li>• Know that 24 hours = 1 day</li> <li>• Know the symbols for pounds (£) and pence (p)</li> <li>• Know the standard units for length (m, cm), mass (kg, g), temperature (<math>^{\circ}</math>C) and capacity (litres/ml)</li> <li>• Know the names and number of sides of 2D shapes</li> <li>• Known the meaning of 'edges', 'faces' and 'vertices'</li> <li>• Know the names and number of faces of 3D shapes</li> </ul>	<ul style="list-style-type: none"> <li>• Know the place value headings of ones and tens</li> <li>• Know that zero is a placeholder</li> <li>• Know the symbols =, &lt;, &gt;, ×, ÷ • Know the place value headings of tenths, ones, tens and hundreds</li> <li>• Know multiplication facts for the 3, 4 and 8 multiplication tables</li> <li>• Know division facts related to the 3, 4 and 8 multiplication tables</li> <li>• Know that a right angle is <math>\frac{1}{4}</math> of a turn</li> <li>• Know the number of days in each month</li> <li>• Know the number days in a year and a leap year</li> <li>• Know that 60 seconds = 1 minute</li> <li>• Know the Roman numerals from I to XII</li> <li>• Know the vocabulary of time including o'clock, a.m., p.m., morning afternoon, noon and midnight</li> <li>• Know the meaning of 'perimeter'</li> <li>• Know the meaning of odd and even numbers</li> <li>• Know doubles and halves up to 20</li> <li>• Know addition and subtraction facts to 20</li> <li>• Know multiplication facts for the 2, 5 and 10 multiplication tables</li> <li>• Know division facts related to the 2, 5 and 10 multiplication tables</li> <li>• Know that 60 minutes = 1 hour</li> <li>• Know that 24 hours = 1 day</li> <li>• Know the symbols for pounds (£) and pence (p)</li> <li>• Know the standard units for length (m, cm), mass (kg, g), temperature (<math>^{\circ}</math>C) and capacity (litres/ml)</li> <li>• Know the names and number of sides of 2D shapes</li> <li>• Known the meaning of 'edges', 'faces' and 'vertices'</li> <li>• Know the names and number of faces of 3D shapes</li> </ul>
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