

What are the aims and intentions of this curriculum?

The aim of our Key Stage 3 Curriculum is to consolidate the numerical and mathematical capability and skills learnt from key stage 2 and to extend students' understanding of the number system and place value to include decimals, fractions, powers and roots. The curriculum also seeks to equip students with the knowledge to be able to make generalisations about the number system that will help them to make the necessary connections between mathematical topics and voids re-teaching when developing concepts in isolation. It also seeks to develop fluent understanding of the axioms and structures of number that are fundamental to mathematics which underpins the understanding of algebraic notations developed in this year and in the subsequent years. The KS3 Curriculum also aims to equip Students to apply algebraic reasoning in new contexts such as Geometry, and to also make linkage to different interpretations of fractions and be introduced to ratio.

Term	Topics	Knowledge and key terms	Skills developed	Assessment
Autumn 1	<ul style="list-style-type: none"> Negative numbers BIDMAS Number theory Fractions 	<p>Student will be able to:</p> <ul style="list-style-type: none"> Interpret negative numbers in a variety of contexts Compare and order positive and negative numbers Use positive and negative numbers to express change and difference Calculate using all four operations with positive and negative values Use number lines to model calculations with negative numbers Form and manipulate expressions involving negative numbers Understand and know order of operations Understand Types of numbers, factors and Divisibility Prime factorisation and with powers. Build on knowledge of fractions from KS2. Finding HCF and LCM of two numbers. Explore multiple interpretations of fractions and establish useful language and representations to use alongside these. consider the concepts of equivalent fractions, working with improper and mixed fractions. 	<ul style="list-style-type: none"> Develop a sense of flexible number composition by solving problems involving time of day and quantities of time. Have an awareness of different numerical systems and their representation. Understand that operations of equal priority can be evaluated in any order Understand that written calculations follow rules of 'syntax' determining the order of operations Understand the higher priority of multiplication with division over addition with subtraction in written calculations. Interpret the order of operations from written calculations, function machines and worded descriptions Explore multiple representations of fractions Recognise and name equivalent fractions Convert fractions to decimals 	<ul style="list-style-type: none"> All Students will be sitting an End of term assessment. Students will be assessed additionally as best seen fit by their subject teacher. Maths watch

	<ul style="list-style-type: none"> Algebraic Expression 	<ul style="list-style-type: none"> Students are required to find equivalent fractions including simplifying by finding common factors in the numerator and denominator. Use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships Substitute values in expressions, rearrange and simplify expressions 	<ul style="list-style-type: none"> Convert terminating decimals to fractions in their simplest form Convert between mixed numbers and improper fractions Compare and order numbers (including like and unlike fractions) Identify variables and express relations between variables algebraically. use and interpret algebraic notation, including: <ul style="list-style-type: none"> ab in place of $a \times b$ $3y$ in place of $y + y + y$ and $3 \times y$ a^2 in place of $a \times a$, a^3 in place of $a \times a \times a$; a^2b in place of $a \times a \times b$ a/b in place of $a \div b$ 	
Autumn 2	<ul style="list-style-type: none"> Algebraic Expression Sequences Angles and Parallel lines 	<p>Students will be able to:</p> <ul style="list-style-type: none"> Collect like terms and simplify expressions and expand brackets. Use geometric patterns to derive sequences Derive sequences from different contexts Find the nth term of a linear sequence Estimate, measure, draw and calculate angles. Describe, classify and identify types of angles using clear vocabulary measure and draw angles accurately. revise facts involving angles around a point, angles at a point on a straight line and vertically opposite angles from experiences in primary school. explore and clarify definitions of parallel lines and perpendicular lines, and use rules around corresponding, alternate and co-interior angles. 	<ul style="list-style-type: none"> Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems Select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems. Generate terms of a sequence from either a term-to-term or a position-to-term rule Recognise arithmetic sequences and find the nth term. Draw and measure acute and obtuse angles reliable to the nearest degree Estimate the size of a given angle Know and use angle facts: angles at a point, angles at a point on a straight line, vertically opposite angles, Angles in a Triangle and Quadrilateral. Generalizations and reasoning – e.g. going beyond two angles Define parallel lines Use angle facts around corresponding, alternate and co-interior angles to find missing angles 	<ul style="list-style-type: none"> All Students will be sitting an End of term assessment. Students will be assessed additionally as best seen fit by their subject teacher. Mathswatch

	<ul style="list-style-type: none"> • Area and Perimeter of 2-D shapes • Fraction, Decimal and Equivalence 	<ul style="list-style-type: none"> • formulate equations to show relationships between angles using the angle facts that are introduced in this unit. • Find Area and Perimeter of 2d shapes. • Starting with rectilinear shapes, build upon to explore the area of other shapes including, triangles and special quadrilaterals. • Area of compound shapes • Explore multiple representations of fractions • Recognize and name equivalent fractions • Convert fractions to decimals • Convert between mixed numbers and improper fractions • Compare and order numbers (including like and unlike fractions) • Convert simple fractions and decimals to percentages • Express one quantity as a fraction of another considering the equivalence of fractions • Add, subtract, multiply and divide fractions. 	<ul style="list-style-type: none"> • Appreciate the concept of area as a measurable quantity • Find the area of rectilinear shapes • Find the area of other 2-D shapes including triangles, and special quadrilaterals • Generalise formulae for finding the area of 2-D shapes using the language of height, base, width, length etc. • Consolidate their numerical and mathematical capability from key stage 2 and extend their understanding of the number system and place value to include decimals and fractions. 	
Spring 1	<ul style="list-style-type: none"> • Percentages 	<p>Students will be able to:</p> <ul style="list-style-type: none"> • work with percentages as another representation of ratios and fractions. • use their knowledge of arithmetic with decimals and fractions. • use of percentages to compare quantities and find a given percentage of a quantity. • increase and decrease quantities by a given percentage and find the original quantity given a percentage of the quantity. 	<ul style="list-style-type: none"> • Understand percentages as a ratio of two quantities where one quantity is standardised to 100 • Understand percentages as a fractional operator with a denominator of 100 • Understand and interpret percentages over 100 • Interpret a percentage as a fraction and decimal • Express a quantity as a percentage of another • Compare two quantities using percentages • Find a percentage of an amount with and without a calculator • Select and use appropriate calculation strategies to solve increasingly complex problems 	<ul style="list-style-type: none"> • All Students will be sitting an End of term assessment. • Students will be assessed additionally as best seen fit by their subject teacher.

- Charts and Averages

- Forming and solving equation

- Construct and interpret charts and graphs
- Calculate averages: Mean, mode, median and range

- Derive equations from different contexts
- Solve linear equations with an unknown on one side

- Find the mean, median mode and range from raw datasets
- Use the mean, median and mode to compare data sets
- Use an average plus the range to compare datasets
- Find the mode, median and mean from tables and graphical representations (not grouped)
- Explore what can and cannot be inferred in statistical settings and begin to express their arguments formally.
- Begin to model situations mathematically and express the results using a range of formal mathematical representations.

- Understand and use the concepts and vocabulary of expressions, equations, inequalities, terms, and factors
- Use algebraic methods to solve linear equations in one variable (including all forms that require rearrangement)

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<p>Spring 2</p>	<ul style="list-style-type: none"> • Written Calculations Multiplication, Addition, subtraction and dividing of decimals. • Rounding and Estimation • Ratio and Map Scale 	<ul style="list-style-type: none"> • Build on KS2 knowledge of adding, subtracting multiplying and dividing with decimals. • Apply approximation in terms of rounding numbers and estimating numbers. • Understand the concept of ratio and use ratio language and notation • Connect ratio with understanding of fractions • Compare two or more quantities in a ratio • Recognise and construct equivalent ratios • Express ratios involving rational numbers in their simplest form • Construct tables of values and use graphs as a representation for a given ratio • Compare ratios by finding a common total value • Solve questions involving ratio. 	<ul style="list-style-type: none"> • Understand the equal priority of addition with subtraction and multiplication with division in written calculations • Rounding to a given number of decimal places and significant figures • Estimation of numbers and employ them in calculations. • Understand the relationship between ratio and fractions • Round numbers to a required number of decimal places • Round numbers to a required number of significant figures • Consolidate their numerical and mathematical capability from key stage 2 and extend their understanding of the number system and place value to include decimals • Estimate quantities in a variety of contexts including area and perimeter • Identify and reason if an estimate is an over- or under-estimate • Work with ratios and quantities. 	<ul style="list-style-type: none"> • All Students will be sitting an End of term assessment. • Students will be assessed additionally as best seen fit by their subject teacher. • Maths watch
<p>Summer 1</p>	<ul style="list-style-type: none"> • Transformation of 2-D shapes <p>Translation, Reflection and Rotation</p>	<p>Students are expected to:</p> <ul style="list-style-type: none"> • Introduce reflection and rotation through previous experience of line and rotational symmetry. • Reflection of an object in a mirror line • Identify horizontal and vertical mirror lines and their equations • Rotation of an object using the centre of rotation • Translate shapes by a given number of units (positive or negative) in the x and y directions 	<ul style="list-style-type: none"> • Reflection of an object in a mirror line • Identify horizontal and vertical mirror lines and their equations • Rotation of an object using the centre of rotation • Translate shapes by a given number of units (positive or negative) in the x and y directions • Combine transformations and which combinations can be expressed as a single transformation • Explore the ratios of sides lengths within and between shapes produced by an object being enlarged by a given scale factor 	<ul style="list-style-type: none"> • All Students will be sitting an End of term assessment. • Students will be assessed additionally as best seen fit by their subject teacher.

- Volumes and Surface Area of 3d shapes

- Algebra recap:
 - Simplifying algebraic expression
 - Rearranging formula
 - Solving simple equations

- Combine transformations and which combinations can be expressed as a single transformation
- Consider how different transformations acting on an object produce different images. Reflection, rotation, and translation.

- To calculate the volume of a prism, identify the cross-section and calculate its area.
- Find the volume and surface area of solids
- Convert between different units of area and volume
- know and apply formulae to calculate the volume and surface area of cuboids and other right prisms

- Simplify algebraic expressions
- Rearrange formulae to make a different subject
- Solve equations and substitute values in order to find unknowns

- Recognise which transformations produce congruent shapes

- know and apply formulae to calculate the volume and surface area of cuboids and other right prisms

- Use algebra to generalise the structure of arithmetic, including to formulate mathematical relationships
- Substitute values in expressions, rearrange and simplify expressions, and solve equations

- Maths watch