

## 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 generalizations about the number system that will help them to make the necessary connections between mathematical topics and avoids 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	Number	Prime factors, estimate, approximate, recurring, outcomes, event, standard form, surd, rationalize, indices, root, irrational, rational	Students will develop the computational skills required by writing numbers as a product of their prime factors, use powers and roots, apply laws of indices including negative and fractional, write ordinary numbers in standard form and vice versa. Students will be understand and explain the difference between rational and irrational numbers as well as rationalize denominators which will develop their reasoning, communication and critical thinking skills.	Formative assessment during lesson (color Planners) Miss B differentiated Sheets (quiz) Peer assessment End of topic class test Formal end of term assessment Topic Feedback sheets (summative assessment)
Autumn 2	Algebra	Expressions, integer, powers, indices, coefficient, term, highest common multiple, equivalent, substitution, formulae, factorize, evaluate, algebraic, brackets, rearrange, subject, sequence, solve	Students will develop computational, reasoning, problem solving, critical thinking and specific algebraic skills through: simplifying expressions using laws of indices, substituting numbers into formula, rearranging formulae, factorize algebraic expressions, solving expressions involving numerical fractions and brackets, distinguish between, expressions, identity, formulae and equations, find the general rule for nth term of arithmetic sequence, solve problems using geometric sequence and the product of two brackets using difference of two squares.	Formative assessment during lesson (color Planners) Miss B differentiated Sheets (quiz) Peer assessment End of topic class test Formal end of term assessment Topic Feedback sheets (summative assessment)

Spring 1	<i>Interpreting and Representing Data</i>	Tally, frequency, plot, coordinates, scale, interpret, bar graph, best fit, line graph, data, correlation, average, frequency polygon	Students will further develop their critical thinking skills, reasoning, communication, interpretational and analytic skills as they construct and use stem and leaf diagrams, construct frequency polygon and pie charts, plot and interpret time series graphs, use trends to predict and interpret what happen in the future, plot and use scatter graphs, decide which average is best for a set of data, estimate mean and range from grouped frequency table, choose appropriate diagrams to display data, recognize and justify misleading graphs.	Formative assessment during lesson (color Planners) Miss B differentiated Sheets (quiz) Peer assessment End of topic class test Formal end of term assessment Topic Feedback sheets (summative assessment)
	<i>Fractions Ratio and Percentages</i>	Percentages, fractions, denominator, numerator, mixed number, improper fraction, proper fraction, simplify, convert, common, proportion, inverse, ratio reciprocal	Students will be able to further develop their computational skills, reading, problem solving and critical thinking skills as they perform the four operations on fractions, find the reciprocal of an integer, decimal or fraction, write ratios in the form n:1 or 1:n, compare ratios, solve problems involving ratios, convert between currencies and measures, recognize and use direct proportion, solve problems involving ratios an proportions, evaluate percent increase and decrease questions, solve real life problems involving percentages.	
	<i>Graphs, Table, Charts</i>	Tally, frequency, plot, coordinates, scale, interpret, bar graph, best fit, line graph, data, series	Students will further develop their critical thinking skills, reasoning, communication, interpretational and analytic skills as they design, read and interpret different types of tables, use data from table to design charts, compare and interpret data shown in bar charts, line graphs etc. Predict trends and what may happen in the future. Construct stem and leaf diagrams, pie charts, scatter diagrams and determine and explain if there is relationship between data.	
Spring 2	<i>Angles and Trigonometry</i>	Hypotenuse, adjacent, opposite, sine, cosine, tangent, inverse, exterior, interior, elevation, depression, plan	Students will be able derive and use exterior angles of triangle fact, calculate interior angles in polygons, know the sum of exterior angle of a polygon, use angles of polygon to solve problems, calculate the length of hypotenuse in right angled triangles, solve problems using Pythagoras' Theorems, use trigonometric ratios to find lengths and angles, find angles of elevation and depression, use trig ratios to solve problems All will develop the students analytical, reasoning, problem solving, computational, communication, drawing skills.	Formative assessment during lesson (color Planners) Miss B differentiated Sheets (quiz) Peer assessment End of topic class test Formal end of term assessment Topic Feedback sheets (summative assessment)
	<i>Equations, Inequalities and Sequences</i>	Expression, equation, evaluate, substitute, simplify, inequality, term, solve, expression, coefficient, inequality	Students will develop problem solving, reasoning, computational, reading, writing and critical thinking skills by being able to: understand and use inverse operations, rearranging and solving a variety of linear equations including brackets, Change the subject of the formula, differentiate between expression, formula, identity and equation, recognize and extend sequence, substitute in formula and find the nth term and explain and justify and answers.	

Summer 1	Graphs	Gradient midpoint, equation, y-intercept, coordinates, maximum, minimum, turning point, surface area, volume, perimeter, compound, velocity, acceleration, distance	Students will be able to find the gradient and y intercept from linear equation, rearrange an equation in the form $y=mx+c$ , compare two graphs from their equations, plot graphs with equation $ax+bx+c$ , sketch gradient and intercepts, find equation of a line given the gradient and one point on the line, draw and interpret distance time graphs and velocity –time graphs, find acceleration and distance from velocity – time graph, draw and interpret real life graphs and draw and use lines of best fit. All will develop the students analytical, reasoning, problem solving, computational, communication, drawing skills. This topic also leans towards developing critical thinking, as students are encouraged to compare, explain and make decisions.	Formative assessment during lesson (color Planners) Miss B differentiated Sheets (quiz) Peer assessment End of topic class test Formal end of term assessment Topic Feedback sheets (summative assessment)
	Area and Volume	Arc, sector, segment, tangent, circumference, chord, volume, area, cross section.	Students will be able to use formulae to calculate area, perimeter, volume, surface area, missing lengths of 2D and 3D shapes, length of arc and areas of sectors. They will also be able to convert between measures of area and volume, estimate lengths and area costs and solve word problems involving volume and area as well as calculate perimeter and area of semi circles and quarter circle. As a result, students will be equipped with estimation, problem solving, critical thinking, computational, reading, drawing and writing skills from these topics.	
	Angles	Symmetry, scalene, equilateral, isosceles, trapezium, quadrilateral, acute, reflex, straight, right	Students will be able to solve geometric problems using side and angle properties of triangle and quadrilaterals, identify congruent shapes, understand and use angles properties on parallel lines, solve angle problems in triangles, prove angle facts, calculate interior and exterior angles of polygons and solve geometrical problems showing reasons for answer. All will develop the students analytical, reasoning, problem solving, computational, communication, drawing skills.	
	Averages and Range	Mean, median, mode, range, sample, averages,	Students will understand how to, find mode median and range from stem and leaf diagram, recognize the advantage and disadvantage of each type of average, find modal class, median from frequency table, estimate the mean of grouped data, understand how to avoid bias. This topic leans towards developing critical thinking, writing and reading skills as students are encouraged to compare, explain and make decisions.	

## Summer 2

*Perimeter, Area,  
Volume*

Area, perimeter, volume,  
rectangle, rhombus,  
parallelogram, kite,  
square, cone, sphere,  
prisms, pyramids, cube,  
cuboid, net, cross-  
section, vertices, edges,  
faces

Students will be able to use formulae to calculate area, perimeter, volume, surface area, missing lengths of 2D and 3D shapes. They will also be able to convert between measures of area and volume, estimate lengths and area costs and solve word problems involving volume and area. As a result, students will be equipped with estimation, problem solving, critical thinking, computational, reading, drawing and writing skills from these topics.

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assessment)

*Transformation  
and Construction*

Compasses,  
perpendicular, bisector,  
parallel, vector, reflect,  
translate, rotate,  
construct, loci

Students will be able draw plans and elevations of 3D solids, perform all transformations, describe transformations using specific key terms, draw scales on maps and scale drawings, solve problems including bearings, construct triangles using rulers and compasses, construct perpendicular bisectors, bisect angles, construct shapes made from triangles and solve problems using locus. As a result, students will be equipped with drawing, reading, writing and reasoning skills from these topics.