Beamont Collegiate Academy Curriculum Map

Year 9 Mathematics

Intent	Implementation	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Knowledge	Units Taught	Developing Number • Number • Further Percentages • Indices & Standard Form	Ratio and Proportion • Ratio • Proportion and Compound Measure	Reasoning with Algebra • Algebraic Expressions • Forming and Solving Equations	Advanced Geometry • Angles and bearings • Pythagoras • Working with Circles	Working with Co-ordinates • Sequences and Straight line graphs • Transformations	Working with Data • Probability • Statistics
	Sequencing	This half term students will continue to develop a sound understanding of number work. They will deepen their understanding of the use of factors and multiples, and apply this to working with fractions. The work on fractions is linked to the topic of Percentages where students will build on their knowledge from Year 7 and Year 8. Students will be introduced to the idea of standard form which incorporates much of the learning on powers from the Year 8 curriculum.	These topics combine to deepen students' understanding of proportional reasoning. They ensure the ability to share amounts of different units including the secure knowledge of converting units correctly and appropriately. Ratio and proportion are used frequently in everyday life when sharing. During Year 7 and Year 8 ratio and proportion was mostly kept to the pure understanding whereas in Y9 we lead the learner towards applying these skills to real life and GCSE style understanding.	To secure a good understanding of the manipulation of numbers and ensure a good cognitive understanding of solving problems using algebraic knowledge The use of Algebra for these topics are the key to linking expressions and equations and solving real life problems based on creating the algebraic calculation to solve a problem Y7 and Y8, children are provided with a sound knowledge of key algebraic concepts which are then accessed to further their cognitive understanding of how to apply them to real live problem solving.	Students will develop an understanding of the relationship between angles, lengths and areas within shapes. Problem solving can be used on shapes by utilising Ratio and Forming and Solving Equations units from earlier in the year. The use of formula in the Algebraic Expressions unit will aid Pythagoras and Circle calculations. This is the first time students will formally meet the formulae for working with circles, which ensures they have the foundation knowledge to prepare them for GCSE.	Sequences and linear graphs both benefit from previous work on Substitution and Equations from 'Reasoning with Algebra' earlier in Year 9. These topics build on knowledge from Sequences and Linear graphs which were completed in Year 8. Students will build on their knowledge of similarity and congruence from Year 8 to look at each of the four transformations on a co-ordinate axis.	This half term students recaps and applies fraction and decimal work done earlier in the year, and applies these skills to the topic of probability. Students will learn to analyse data in both the raw form and in the form of frequency tables; as well as looking at how to present this data in statistical diagrams. The work on proportion and angles will assist students in constructing and interpreting Pie charts.

	Substantive Knowledge *Declarative : "I Know that.."* *Proceedural : "I Know How"* *Conditional : "I Know When.."*	<u>Use of Number</u> • Understand Factors, Multiples and Primes • Common Multiples and LCM • Prime Factorisation • Venn Diagrams • Comparing Fractions • + and - Fractions • Algebraic Fractions <u>Percentages</u> • Fractions of amounts • Multiplying Fractions • Ordering F. D. P • Calculating Percentages (inc Calculator) • Increase/Decrease by a Percentage • Reverse Percentages • Simple and Compound interest • Percentage Change • Reverse Percentages <u>Indices & Standard Form</u> • Powers and Roots • P & R on Calculator • Surds • Laws of Indices • Standard Form (Converting to and from) (Inc >1) • Standard form on Calculator	<u>Ratio</u> • Understanding Ratio • Simplifying Ratio • 1 : n or n : 1 • Dividing into ratio • Using one part to find another • Using the difference to find other parts • Problem Solving with Ratio • Ratio and a Fraction or Percentage • Finding Ratio without quantities • Changes in Ratio <u>Proportion and Compound Measure</u> • The Unitary Method • Direct Proportion • Recipe problems (Calc and Non-Calc) • Currency and Exchange Rates • Proportion and Exchange Rates • Intro to Inverse Proportion • Calculating Speed (Calc and Non-Calc) • Calculating Distance/Time • Problem Solving involving SDT	<u>Algebraic Expressions</u> • Revisit Directed Numbers • Writing and Simplifying Expressions • Simplifying Expressions in Context • Expand Brackets and Simplify (Including Binomials) • Factorize into Single and Double Brackets • What is a quadratic? • Difference of two squares • Substitution Rearrangement of Formula <u>Forming and Solving Equations</u> • Solving one and two step equations • Solving Linear Inequalities • Equations with Brackets • Solving equations with missing value on both sides • Fractional equations • Equations in Context • Solving Angle and Perimeter equations	<u>Angles and Bearings</u> • Calculating angles • Multi-step problems • Algebra in shapes • Polygon angles • Compass points <u>Pythagoras</u> • Squares and Roots • Calculating long and short sides • Identify Pythagoras and application • 3 dimension problems <u>Working with Circles</u> • Parts of a circle • Circumference • Area • Pi • Estimation • Semi-Circles • Cylinder volume	<u>Sequences and Straight Line Graphs</u> • Linear Sequences • Finding nth term • Linear plotting • ax +by = c graphs • Gradient problems • Intercepts • Parallel equations • Straight line equation <u>Transformations</u> • Translation • Reflection • Rotation • Combination • Enlargement • Enlargement from centre • Fractional and negative scale factor • Similar shapes and triangles	<u>Probability</u> • Listing outcomes • Product rule • Probability scale • Single event • Sum of probabilities • Mutually exclusive • Sample spaces • Experimental <u>Statistics</u> • Bar charts • Pie charts • Averages from individual data • Mean problems • Quartiles and box plots (H) • Averages from frequency tables • Averages from grouped data • Frequency polygons • Histograms (H) • Scatter graphs
Assessment	Summative assessment	Each unit of work within this half term is assessed using a formal assessment.	Each unit of work within this half term is assessed using a formal assessment.	Students will sit a formal, cumulative assessment during this half term.	Each unit of work within this half term is assessed using a formal assessment.	Each unit of work within this half term is assessed using a formal assessment.	Students will sit formal, cumulative assessments during this half term.

Links	Main Links across the Curriculum	-Number -Basic number sense -Working with Negatives -Further Percentages -Fractions and Decimals -Indices & Standard Form Expressions	-Ratio -Proportion and Compound Measure	-Algebraic Expressions -Forming and Solving Equations	-Use of Number -Ratio -Algebraic expressions -Forming and Solving equations	-Substitution -Linear equations -Ratio (for similar shapes)	-Decimals -Fractions -Measuring angles
	Cross-Curricular Links	Number is used in Science i.e. Standard form. Technology requires extensive use of measure in decimal form.	Food Tech incorporates ratio and proportion when mixing ingredients	Science – Physics relies on the use of equations and formulas.	Angles and measurements used in Design Technology. Bearing and scaling used in geography.	Sequences are used in Computer programming	Table and graphs analysis in subjects for example: Geography, Business studies
	Links to the Real World / Careers / P.D.	Number is used in everyday Shopping, Manual trades, Banking and finance. Further Percentages used in Shopping and financial i.e Loans and Mortgages	Proportion and Compound Measure is used in the Building industry, Catering and Medicine	Algebraic Expressions Forming and Solving Equations are used in Engineering and design, Computer programming.	Angles are used in Architecture, navigation.	Sequencing is used in predictions ie. Meteorologists and statisticians. Straight line graphs are used so show information in business and public health data. Ie. Covid-19 information.	Displaying and interpreting data in all business models. Probability is used in the prediction of costing. Ie. Life insurance, Car insurance, etc…
Vocabulary	Key words	**Number** Factor Multiple Common Prime Numerator Denominator **Further Percentages** Percentage Change Interest Multiplier **Indices / Standard Form** Power Indices / Index Squared / Cubed Root / Cube root Product	**Ratio** Parts Factor Simplify Proportion Multiple Common Multiple Divide **Compound Measure** Proportion Direct Inverse Unitary Parts	**Algebraic Expressions** Expand Factorise Simplify Term Binomial Square Substitute **Solving Equations** Equation Solve Variable Context Area Perimeter Inequality Fraction	**Angles and Bearings** Regular/irregular Interior/Exterior Polygon names Bearing **Pythagoras** Hypotenuse Right angle Square root **Working with Circles** Circumference Radius Diameter Sector Arc Pi	**Sequences & Graphs** -Gradient -Function -Y Intercept -Linear -Parallel -Co-ordinate -Equation **Transformations** -Reflect -Rotate -Translate -Enlarge -Fractional -Centre -Axis	**Probability** -Chance -Unlikely -Random -Even -Biased -Mutually exclusive -Sample space **Statistics** -Frequency table -Average -Mean -Median -Range -Mode -Grouped data -Quartiles -Histogram -Scatter graph