



**Intent: To build a deep understanding of fundamental concepts within mathematics. Learners will use the strong numerical foundations established in Year 7 to develop fluency in other key subject areas, primarily Ratio and Proportion, Geometry and Algebra.**

**Mathematics**

**Year 8**

**Ratio and Proportion**

**Geometry**

**Algebra**

**Knowledge**

(facts, information, concepts and key terminology)

Converting between fractions, decimals and percentages, simplifying and sharing ratios, proportional reasoning, maps and scales, percentages of amounts, multipliers, percentage increase and decrease.

Circles, circumference, area, basic sectors, 3D shapes, volume, surface area, angles properties, angles in shapes, properties of shapes, angles in parallel lines.

Types of sequences, nth term of linear sequences, plotting sequences, expanding brackets, solving equations, writing, substituting into and rearranging formulae.

**Understanding**

(ability to connect and synthesise knowledge within a context)

The equivalence between fractions, decimals, percentages and ratios. How bar models and ratio tables can support learning in order to simplify problems when necessary.

The properties of 2D and 3D shapes which make them unique. Confidence with the concept of space relating to 2D and 3D shapes.  
Angles are a numerical representation of a turn and they take different properties depending on where they are present.

Numerical and pictorial sequences can be generalised using algebraic notation. Links between two or more variables can also be represented algebraically.

**Skills**

(successful application of knowledge and understanding to a specific task)

Fluently interchange between fractions, decimals, percentages and ratios in order to answer challenging questions based upon the most efficient method.  
Apply knowledge to contextual problems.

Use knowledge of shapes and angles to efficiently solve problems. Find links between shapes in order to lighten the cognitive load when remembering key properties.  
Apply knowledge and understanding in order to real-life problems.

Use algebraic representations to efficiently find any term of a sequence.  
Being able to transfer numerical skills used in calculations and solving equations to even more abstract concepts, notably generating and rearranging formulae.

**Formal Assessments**

(those done by all/vast majority of the cohort)

Termly cumulative assessments covering content from start of year 7.  
Topic Assessments after each topic has been delivered.

By the end of the year students on course for at least a grade 5 will... have developed a fluency and a deep understanding of fundamental concepts in proportional reasoning, geometry and algebra.

\*The timings and order of delivery shown are approximate, these may change on a class-by-class basis\*

Term 1

Topic	Breakdown	Hegarty Links
Fractions, Decimals and Percentages	Fractions - Decimals	
	Fractions -> Decimals -> Percentages	73, 74
	Percentages -> Decimals -> Fractions	75, 76
	Using a calculator	
Circles	Labelling	592
	Circumference	534, 535
	Area	539, 540
	Fractions of circles	547
Sequences	Describing types of sequences (term to term)	261
	Position to term	196, 197
	Applying nth term	198
	Sequences from patterns	
	Plotting sequences	206

Term 2

Topic	Breakdown	Hegarty Links
3D Shapes	Vertices, Edges and Faces	830
	3D Shapes and Nets	829, 833, 834
	Volumes of prism	567, 568, 570
	Surface Area	584, 585
Ratio and Proportion	Introduction	328, 329
	Simplify	331
	Share	332, 333
	Proportional reasoning	705, 739, 339
Angles	Maps and scales	864,865
	Introduction to angles	456, 477, 812, 461
	Angles in triangles	485
	Properties of triangles	
	Angles in quadrilaterals	815
	Properties of quadrilaterals	824, 825
	Properties of polygons	561, 563

Term 3

Topic	Breakdown	Hegarty Links
Percentages	Amounts as percentages	
	Percentages of amounts	84, 85
	Percentages with multipliers	86, 87
	Percentage increase and decrease	90
Equations and Formulae	Expanding single brackets	162, 163
	Solving equations	184, 178-181
	Writing formulae from worded problems	155
	Substituting into formulae	278
	Rearranging formulae	280 - 285
Angles in parallel lines	Corresponding	483
	Alternate	481
	Co-interior	482
	All angles in parallel lines	490, 491