

"Our curriculum is designed to help students truly master mathematics, so they can apply their skills in unfamiliar situations whenever needed. Topics from the same content areas have been grouped together to form mastery half terms. More time is spent teaching fundamentals to avoid reteaching in later years."

Spring 2: Ratio and proportion

Skills	<ul style="list-style-type: none"> • Solve problems involving ratios and rates (revise from year 7 and 8) • Enlarge a shape by integer and fractional scale factors • Describe an enlargement with reference to a centre of enlargement • Determine whether two or more shapes are similar • Solve problems with similar triangles in context such as nested triangles • Calculate with surds, including simplification, addition and multiplication • Rationalise the denominator of a simple fractional surd • Use the trigonometry ratios to describe and solve right angled triangles • Use the inverse trigonometry ratios to find missing angles • Use surds in calculations with trigonometry ratios
Knowledge	<ul style="list-style-type: none"> • Use ratio notation to describe a multiplicative relationship between two quantities (revise from year 7) • Use the language of similarity, enlargement and congruence • Know what properties are invariant between two similar shapes • Understand and use 2- and 3-D scale factors for similar figures • Know the meaning of rational and irrational numbers; identify surds • Understand that trigonometry ratios describe a class of similar right angled triangles with a given angle • Link trigonometry and surds with prior learning about Pythagoras' theorem • Explore how trigonometric graphs represent the sine, cosine and tangent functions
Rationale	<p>In this unit students build on the proportional reasoning taught in year 7 and allows students to experience the different ways of defining ratio and proportion. Throughout year 7, students' proportional reasoning was developed through experiences in multiplication, division, fractions, decimals and percentages, as well as a unit introducing the formal notation for ratio. Time is spent in this unit reinforcing the notion of a ratio as an expression of a constant multiplicative relationship which can be between two quantities in the same unit e.g. fractions or between two quantities in different units e.g. speed measured in miles per hour.</p> <p>A variety of contexts, both previously experienced (groups of objects, unit conversion, scaling recipes, cost) and new (speed and average speed, density) are used to explore and clarify concepts. Having established ratio as an expression of a relationship between two quantities, this is applied to ratio problems where students are required to divide an amount into a given ratio and find different quantities given a ratio.</p> <p>The models of ratio tables, double number lines, bar models and linear graphs are used to support development of flexible strategies and understanding of procedures.</p>