Scheme of Learning: Year 11 Higher Spring Term

Topic Sequence: Reasoning

1	2	
Multiplicative Reasoning	**Geometric Reasoning**	**Algebraic Reasoning**

Topic Overview:

Students develop their multiplicative reasoning in a variety of contexts from simple scale factors through to equations involving direct and inverse proportion. There is also a review of ratio problems. Content covered includes extending and formalising their knowledge of ratio and proportion, including trigonometric ratios, in working with measures and geometry and in working with proportional relations algebraically and graphically. Content also includes comparing lengths, areas and volumes using ratio notation and/or scale factors; making links to similarity and understanding the equations that describe direct and inverse proportion

Lesson Sequence:

Direct and Inverse Proportion – scale factors
This step is a recap of the concept of proportion and ratio, including scale factor, using fractional scale factors as well as those above
1. Students revisit the definition of a similar shape and higher tier students revisit the concept of area and volume scale factors

Direct and Inverse Proportion – graphs
The idea of constant multiplier and constant product is further explored here, with students exploring the graphs of both types of proportion, with direct being more familiar. Students can compare the graphs of inverse proportion relationships with that of the reciprocal function

Understand Algebraic Direct Proportion
The aim of this step is to understand direct proportion before introducing $y = kx$. Direct proportion relationships such as diameter and currency conversions are revisited. Students are exposed to different representations, such as word problems, graphs and equations. Students studying for foundation tier also form direct simple equations in this step ($y = kx$)

Direct Proportion Equations
Students are introduced to the proportionality symbol α, and the constant of proportionality k. Knowledge of constant ratios in a direct proportion relationship leads to the general equation $y = kx$. A common mistake is to find k but then forget to substitute it into the equation.

Understand Algebraic Inverse Proportion
Students use different examples (such as speed, distance time or mass, density volume) to distinguish between direct and inverse proportion. Students studying for foundation tier also form simple inverse proportion equations in this step ($y = k/x$)

Inverse Proportion Equations
Students are now familiar with both direct and inverse proportion relationships. This leads to more complex inverse proportion equations, working in the abstract.

Sequence of Learning:	
1	Use Scale Factors for Direct and Inverse Proportion
2	Direct and Inverse Proportion Graphs
3	Understand Algebraic Direct Proportion
4	Direct Proportion Equations
5	Understand Algebraic Inverse proportion
6	Inverse Proportion Equations

Topic Resources:	
Knowledge Map:	Ratio and scale Direct and Inverse proportion

Assessment:	
Knowledge:	End of Topic Test
Application of Knowledge:	Termly Summative Assessments

Supportive Reading:	
Any supported reading listed here	Sparx maths: www.sparxmaths.co.uk
	Corbett Maths: www.corbettmaths.com
	AQA Revision guide