Scheme of Learning: Year 9 Summer Term

Topic Sequence: Reasoning with Proportion

12	13	14
Enlargement and Similarity	Solving Ratio and Proportion problems	Rates

Topic Overview: Solving Ratio and Proportion problems

Building upon students previous learning on ratios, they will solve all types of ratio problems and make links to direct proportion graphs. Students will study inverse proportion formally for the first time. Students may be extended to look into inverse proportion graphs and solve complex problems involving algebra.

Learning Sequence:

Solve problems with direct proportion (R)
Students will be familiar with direct proportion from previous learning. Student will review their learning, comparing different methods for finding solutions, such as the unitary method and using factors of multiples. Students will be reminded of the relationship between variables, such as that if one variable is multiplied by *x*, the other variable must also be multiplied by *x*.

Direct proportion and conversion graphs (R)
Students will be reminded of previous learning on direct proportion graphs, and will be able to spot which graphs show direct proportion and which do not. They will note that graphs must be linear, and starting from the origin, and the reasons why other graphs are non examples of direct proportion. The link between the gradient of a direct proportion graph and the constant of proportionality will also be explored.

Solve problems with inverse proportion
Here students will explore inverse proportion relationships, discovering that as one variable is multiplied by a scale factor, the other variable must be divided by the same scale factor. Students will learn that in inverse proportion questions, assumptions need to be made, such as that all workers will perform at the same rate.

Graphs of inverse relationships (H)
Students will compare and contrast graphs of inverse and direct proportional relationships. Key features of the graphs will be investigated, including the fact that the lines do not meet the axes.

Solve ratio problems given the whole or a part (R)
Students will revisit and apply their knowledge and understanding of ratio problems. Students will also explore ratios where comparisons are between more than two items.

Solve 'best buy' problems
Students have already considered unit pricing in the 'Maths and Money' block in the Spring term. Here students can revise this idea and compare with different alternative methods. This will allow class discussion on the most efficient methods for various questions. Students can then look at problems involving special offers and percentage reductions.

Solve problems ratio and algebra (H)
Students will combine they algebraic and ratio knowledge to solve complex problems. Students should be confident with fractions associated with ratios, in particular realising that is $a : b = c : d$ then $\frac{a}{b} = \frac{c}{d}$. This can be checked with numerical examples. Students will also consider how to form equations from given problems and what steps are needed to solve them.

Sequence of Learning:

		Topic Resources:	
1	Solve problems with direct proportion (R)	**Knowledge Maps:**	Ratio and Scale Direct and Inverse Proportion
2	Direct proportion and conversion graphs (R)		
3	Solve problems with inverse proportion	**Assessment**	
4	Graphs of inverse relationships (H)	**Knowledge:**	End of Topic test
		Application of Knowledge:	Termly mixed topic assessment
5	Solve ratio problems given the whole or a part (R)	**Supportive Reading:**	
6	Solve 'best buy' problems		Sparx Maths www.sparxmaths.co.uk
			Corbett Maths : www.corbettmaths.com
7	Solve problems ratio and algebra (H)		AQA Revision Guide