

# Scheme of Learning: Year 8 Autumn Term

## Topic Sequence: Proportional Reasoning

1	2	3
Ratio and Scale	Multiplicative Change	Multiplying and Dividing Fractions

## Topic Overview: Ratio and Scale

Students now work with the link between ratio and scaling, including the idea of direct proportion, linking various forms including graphs and using context such as conversion of currencies which provides rich opportunities for problem solving. Conversion graphs will be looked at in this block and could be revisited in the more formal graphical work later in the term. Links are also made with maps and scales, and with the use of scale factors to find missing lengths in pairs of similar shapes.

## Learning Sequence:

### Solve problems involving direct proportion

In this small step, we will explore the fundamentals of direct proportion. Students could think of examples of direct proportion in real life, where as one variable doubles, so does the other. Multiple methods should be explored to give students strategies for the variety of problems that can be posed.

### Explore conversion graphs

This is a particular skill that students will come across in many other topics in school. For more precise conversions, graph paper will be used practising the use of scales. Students will be encouraged to draw vertical and horizontal lines for the most accurate conversions from their graphs.

### Convert between currencies

Conversion of currency brings together many of the ideas covered in previous small steps. We will explore the many different methods that can be employed in this topic. Students will be encouraged to estimate their answers before converting to ensure they have a sensible answer. Both calculator and non-calculator will be explored, considering which is appropriate when.

### Explore relationships between similar shapes

Students have already been briefly exposed to similar shapes in their exploration of  $\pi$  and gradient. In this small step, we will focus on the fact that corresponding lengths on similar shapes are in the same ratio. Students will be familiar with similar shapes presented in different orientations. Exploration of examples and non-examples will be used to cement the concept of similar shapes.

### Understand scale factors as multiplicative representations

Bringing together work on ratio of 1 :  $n$  and similar shapes, this small step introduces enlargement scale factors, and may be taught in conjunction with the similar shapes small step. The focus is on length scale factor, not area or volume, though some students may naturally make observations.

### Draw and interpret scale diagrams

Students can explore this step practically by creating and using scale drawings of items in the classroom etc. The link between scale, scale factors and ratio will be made explicit. This may be reinforced by linking back to earlier representations such as the double number line. Examples of diagrams that are not to scale may be useful to emphasise the key features of scale.

### Interpret maps using scale factors and ratios

We may revisit metric unit conversions before starting this small step. Specifically, students need to be confident in working with large numbers (for example, above 10 000). This small step will be introduced using real-life maps, and the meaning of each scale. Using representations, such as double number lines, will help students to connect this small step to previous ones.

Sequence of Learning:		Topic Resources:	
1	Solve problems involving direct proportion	<b>Knowledge Maps:</b>	Compound and non-compound measures Ratio and Scale Direct and Inverse Proportion – number Direct and Inverse Proportion - algebraic
2	Explore conversion graphs		
3	Convert between currencies	<b>Assessment:</b>	
4	Explore relationships between similar shapes	<b>Knowledge:</b>	End of Topic test
5	Understand scale factors as multiplicative representations	<b>Application of Knowledge:</b>	Termly mixed topic assessment
6	Draw and interpret scale diagrams	<b>Supportive Reading:</b>	
7	Interpret maps using scale factors and ratios	<b>Any supported reading listed here</b>	Sparx Maths <a href="http://www.sparxmaths.co.uk">www.sparxmaths.co.uk</a>
			Corbett Maths : <a href="http://www.corbettmaths.com">www.corbettmaths.com</a>
			AQA Revision Guide