

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 will have had a little experience of multiplying and dividing fractions in Year 6; here we seek to deepen understanding by looking at multiple representations to see what underpins that (often confusing) algorithms. Multiplication and division by both integers and fractions are covered, with an emphasis on the understanding of the reciprocal and its uses. Links between fractions and decimals are also revisited. Students following the Higher strand will also cover multiplying and dividing with mixed numbers and improper fractions.

Learning Sequence:

Represent multiplication of fractions

Repeated addition is used here to help understand the multiplication of fractions. Students will also explore familiar representations of fractions from previous years. Manipulatives such as paper plates and fraction pieces can be used to demonstrate the multiplications. Paper strips and Cuisenaire rods link well to pictorial representations as well as bar models.

Multiply a fraction by an integer

In this small step, students explore and formalise multiplication of a fraction by an integer. Calculations supported with pictorial representations are still encouraged at this stage. Multiple methods will allow students to pick the strategy that best suits the question. It will be useful to remind students of the word “product” at this stage.

Find the product of a pair of unit fractions

This step gives students the chance to understand the underlying mathematics of multiplying any fractions together. When folding paper, students will be reminded that each side of the original shape has a unit length of 1. This links it to grid method multiplication and clearly shows the size of the product of unit fractions is always smaller than 1.

Find the product of a pair of any fractions

This small step will look at the multiple ways in which the students might approach finding the product of any two fractions, allowing students to come up with their own conjectures for “quick methods”. Again, using familiar concrete and/or pictorial representations from previous steps will support abstract understanding.

Divide an integer by a fraction

In this small step, students understand the link between multiplying and dividing integers to multiplying and dividing fractions. A fact family with integer values will be intuitive but students may want to ask more questions when the fact family involves division of fractions. Demonstrations with bar models and fraction strips will be used to help explain this.

Divide a fraction by a unit fraction

As work with fractions becomes more abstract, it is useful to get students to reason their solutions. The questions asked in this small step will revolve around reasoning rather than procedure. The language of dividing, “How many ... in ...?”, will help students to estimate answers before formally giving them.

Understand and use the reciprocal

Here, students will learn through investigation that the division of a number is equivalent to the multiplication by its reciprocal. They should be able to find the reciprocal of fractions and decimals and use these to answer questions on division. They should also understand that a number multiplied by its reciprocal is always 1.

Divide any pair of fractions

Students should now have developed their reasoning and so have many methods available for dividing fractions. This small step develops the concepts further so they can understand the division of any pair of fractions. Students will be encouraged to think about efficient methods depending on the question instead of relying solely on procedure.

Sequence of Learning:		Topic Resources:	
1	Represent multiplication of fractions	Knowledge Maps:	Fractions
2	Multiply a fraction by an integer		
3	Find the product of a pair of unit fractions	Assessment:	
4	Find the product of a pair of any fractions	Knowledge:	End of Topic test
5	Divide an integer by a fraction	Application of Knowledge:	Termly mixed topic assessment
6	Divide a fraction by a unit fraction	Supportive Reading:	
7	Understand and use the reciprocal	Any supported reading listed here	Sparx Maths www.sparxmaths.co.uk
8	Divide any pair of fractions		Corbett Maths : www.corbettmaths.com
			AQA Revision Guide