Scheme of Learning: Year 7 Spring Term

Topic Sequence: Application of Number

6	7	8
Solving problems with addition and subtraction	Solving problems with multiplication and division	Fractions and percentages of amounts

Topic Overview:Solving problems with multiplication and division

The rest of the term is dedicated to the study of multiplication and division, so allowing for the study of forming and solving of two-step equations both with and without a calculator. Unit conversions will be the main context as multiplication by 10, 100 and 1000 are explored. As well as distinguishing between multiples and factors, substitution and simplification can also be revised and extended. Again, the emphasis will be on solving operation to solve a problem will also be a focus. There will also be some exploration of the order of operations, which will be reinforced alongside much of this content next term when studying directed number.

Learning Sequence:

Properties of multiplication and division Students will be reminded of various forms of representing multiplication including those shown on number lines. Scale models will be discussed as well as repeated addition. The inverse nature of multiplication and division will be emphasised as will the commutativity and associativity of multiplication

Understand and use factors Students will revisit the concept and check understanding through the use of arrays and area models. A systematic approach will be emphasized when recording factors such as recording factor pairs in ascending order. They will explore why a number is not a factor as well as why a number is.

Understand and use multiples Students will be expected to understand that a multiple of a number is the result of multiplying a number by an integer, bar models will be used. Students will list out the multiples of numbers by multiplying the number by 1,2,3 etc. Students will also be able to work out common multiples of numbers and also understand the term lowest common multiple.

Multiply and divide by powers of 10 In this step prior understanding will be assessed and will ensure that the students have the conceptual understanding and not just the that they rely on the rules or procedure. Particular attention is paid to working with decimals.

Multiply by 0.1 and 0.01 (H) In this step emphasis will be on the links between fractions and decimals. For students following the core strand they will concentrating on multiplying by 0.1. Division by decimals is studied in year 8

Convert metric units Students will understand the different types of metric units – length, mass and capacity. They will understand the relative size of these measures and make connection between them. This will help them to see whether they need to multiply of divide rather than relying on just remembering.

Formal methods: multiply integers Students will have been exposed to formal methods previously but may not have discussed the conceptual understanding behind each individual method if which method is a more efficient method to use especially when we are using increasingly large numbers. They will revisit estimating using rounding to one significant figure.

Formal methods: multiply decimals Students will learn to multiply decimals through using what they have learned about multiplying and dividing by powers of 10. For example when multiplying 0.2 by 0.3 they should think of it as 2 x 3 first then adjust their answer to match the original question. Students will recognise that the calculation has been multiplied by 100 not 10 and therefore the answer should be divided by 100 not 10 giving them 0.06.

Formal methods: divide integers Students will have studied both short and long division before, in this step they will revisit the formal method and also consider strategies to simplify complex calculations. Problems will be chosen so that the answers with remainders and with decimals are appropriate.

Formal methods: divide decimals This step builds on the previous by extending to dividing decimals by integers. Dividing decimals by decimals is covered in Year 8. Students will use formal methods for division used earlier to divide a decimal by an integer. They will be reminded that a division may be written as a fraction too.

Order of operations Students will have met the order of operations previously but some may be reliant on rules such as BIDMAS and may have misconceptions about when it is correct to work from left to right e.g 10-3+5 should be 7+5=12 but it is often incorrectly performed as 10-8

Area of rectangles and parallelograms Students will explore the connections between the area of a rectangle and parallelogram. They will see how the area formula for both shapes are related.

Area of triangles The focus of this step is more on solving problems as they have met the area of triangles previously. Students will be reminded that the area of a triangle is found by multiplying the base by the height and dividing the answer by 2. They will be shown why by looking at squares, rectangles and parallelograms divided into two equal sized triangles.

Area of trapezia (H) Students will be asked to find the area of a trapezium. They will consider replacing the sides with letters to find the general formula for the area of a trapezium. They will explore isosceles, acute and obtuse examples. They will be encouraged to find the area by using the formula

Solve problems using the mean Students will be guided to understand the mean of a set of numbers is an example of an average. The mean is an idea of central tendency, the students will be encouraged to understand visually what happens when you find the mean and how the set of numbers "average out". This will help them to find missing numbers. Some students will be extended to find the mean of a set of numbers that have been summarised in a table.

Multiplication and division with algebra (H) Students will already be familiar with substituting into expression from their study in Autumn. This step builds on this and gives them the opportunity to explore complex expressions involving repeated letters and more then one letter. Division should be taught alongside multiplication emphasising the inverse nature of the operation.

Sequence of Learning:

1	Properties of multiplication and division
2	Understand and use factors
3	Understand and use multiples
4	Multiply and divide integers and decimals by powers of 10
5	**Multiply by 0.1 and 0.01 (H)**
6	Convert metric units
7	Use formal methods to multiply integers
8	Use formal methods to multiply decimals
9	Use formal methods to divide integers
10	Use formal methods to divide decimals
11	Understand and use order of operations
12	Solve problems using the area of rectangles and parallelograms
13	Solve problems using the area of triangles
14	**Solve problems using the area of trapezia (H)**
15	Solve problems using the mean
16	**Explore multiplication and division in algebraic expressions (H)**

Topic Resources:

Knowledge Maps:	Place Value Multiples, Primes, Factors 2D shapes Averages

Assessment:

Knowledge:	End of Topic test
Application of Knowledge:	Termly mixed topic assessment

Supportive Reading:

Any supported reading listed here	Sparx Maths www.sparxmaths.co.uk
	Corbett Maths : www.corbettmaths.com
	AQA Revision Guide