Scheme of Learning: Year 7 Autumn Term

Topic Sequence: Place Value and Proportion

4	5
Place value and ordering integers and decimals	Fractions, decimal and percentage equivalence

Topic Overview: Place value and ordering integers and decimals

In this unit, students will explore integers up to one billion and decimals to hundredths, adapting these choices where appropriate for your groups e.g. standard index form could additionally be introduced to student following the Higher strand. Using and understanding number lines is a key strategy explored in depth, and will be useful for later work on scales for axes. When putting numbers in order, this is a suitable point to introduce both the median and the range, separating them from other measures to avoid getting them mixed up. Rounding to the nearest given positive power of ten is developed, alongside rounding to one significant figure. Decimal places will come later, again to avoid too similar concepts being covered at the same time. Topics from last term such as sequences and equations, will be interleaved into this unit.

Learning Sequence:

Recognise Integer place value This step revises and extends their prior knowledge. Students will write and represent the numbers in several ways and will see a mixture of smaller and larger integers.

Understand and write integers Students will become fluent in converting integers from numeral form to words and vice-versa. They will also become comfortable in dealing with other representations. Populations and government finances provide good contexts for real numbers. Comma notation will be taught alongside the more common spacing between every three digits.

Work out integers on a number line This key skill will be useful with later work on fractions and reading/scaling graphs. Students will be taught to work out the intervals given the number of spaces on a line and to fill in missing values.

Position integer on a number line Students will start to use these to place integers and to read values. Making links to reading from common scales such as weighing scales, measuring jugs and thermometers.

Round integers to powers of ten Students will be able to round to the nearest 10, 100, 1000 etc. Emphasis will be placed on "nearest" meaning proximity, encouraging students to think about the size of the number rather than rote-learned rules. "Rounding up" for halfway should be explained as a convention.

Order a list of integers Students will compare two integers confidently before they can go to order a larger list of numbers. Students will be familiar with the equals sign but will be introduced to $\neq$. They will be encouraged the use of "greater than" and "less than" rather than "bigger than"/"smaller than" etc. and will pay attention to reading statements like "829 < 850" both from left to right and from right to left.

Find the range of a list of integer Students are able to confidently order integers, finding the range is straightforward. Care will be taken so that students remember to find the difference between the greatest and least values rather than state "they range from ___ to ___".

Find the median of a list of integers Students will be taught how to find the median from a list with both an even amount and an odd amount of numbers.

Understand place value – decimals Students following the Foundation strand will focus on proper understanding of tenths and hundredths during this step, and throughout this unit. Moving on to thousandths and beyond if appropriate for the students. Conversion between fractional and decimal forms of tenths and hundredths are covered in depth in the next block.

Position decimals on a number line Student will be finding the intervals in decimal number lines, and this key skill will be revisited in the upcoming FDP work. The focus in this step is appreciating the place value of decimal numbers and how this affects their relative positioning. Challenge will be added if appropriate by looking at intervals of 0.2, 0.05 etc,

Compare and order any numbers Students will now be able to compare decimal numbers as well as integers. It is important that students read numbers correctly e.g. "nought point three five" as opposed to "nought point thirty-five" as this leads to misconceptions such as 0.35 > 0.4. Students following the Foundation strand will focus on numbers with up to two decimal places at this stage.

Round to 1 significant figure Students will learn the key skill of rounding to 1 significant figure both with integers and decimals, as this key skill in estimation is much more useful than rounding to decimal places which is covered later in the scheme. This will be revisited regularly whenever appropriate. Some students may explore two or three significant figures, but this is not essential at this stage.

Investigate powers of 10 (H) As a precursor to writing numbers in standard index form., this step looks at writing numbers like 10 000 in the form 10^n. A calculator may be used to introduce this, and it will also provide good practice for using terms like billion. Students following the Foundation strand may access this if time allows but it will be covered in the future if more time is needed to gain fluency with earlier steps.

+ve integers in the form of Ax10ⁿ (H) As standard index form is studied in depth in Year 8, this step focuses on writing and interpreting numbers like 8×10^9 rather than numbers that need decimals such as 7.4×10^6. The intention is to get a good understanding of the basics

Investigate –ve powers of 10 (H) Similarly to the earlier step on positive powers of 10. students here explore powers of 10 for numbers between zero and one. Negative numbers have been introduced during KS2 and so students should be aware that e.g. -2 is greater than -4.

Decimals in the form of Ax10ⁿ (H) Again the focus is on writing and interpreting numbers like 2×10^{-3} rather than numbers that need decimals such as 2.4×10^{-3}. This might come up in discussion and be addressed briefly, this knowledge and understanding will be considered in depth during Year 8.

Sequence of Learning:

1	Recognise the place value of any number in an integer up to one billion
2	Work out intervals on a number line
3	Position integers on a number line
4	Round integers to the nearest power of ten
5	Compare two numbers using =, $\neq$, <, >, ≤, ≥
6	Order a list of integers
7	Find the range of a set of numbers
8	Find the median of a set of numbers
9	Understand place value for decimals
10	Position decimals on a number line
11	Compare and order any number up to one billion
12	Round a number to 1 significant figure
13	**Write 10, 100, 1000 etc. as powers of ten (H)**
14	**Write positive integers in the form A x 10n (H)**
15	**Investigate negative powers of ten (H)**
16	**Write decimals in the form A x 10n (H)**

Topic Resources:

| Knowledge Maps: | Place Value and Estimation
Standard Form |
|---|---|

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