**Shaping the Year 7 Curriculum:**

**Building on Year 6**

**Key Idea 1: A deep understanding of place value**

(6NPV–1 Powers of 10; 6NPV–2 Place value in numbers up to 10,000,000; 6NPV–3 Numbers up to 10 million in the linear number system; 6NPV–4 Reading scales with 2, 4, 5 or 10 intervals).

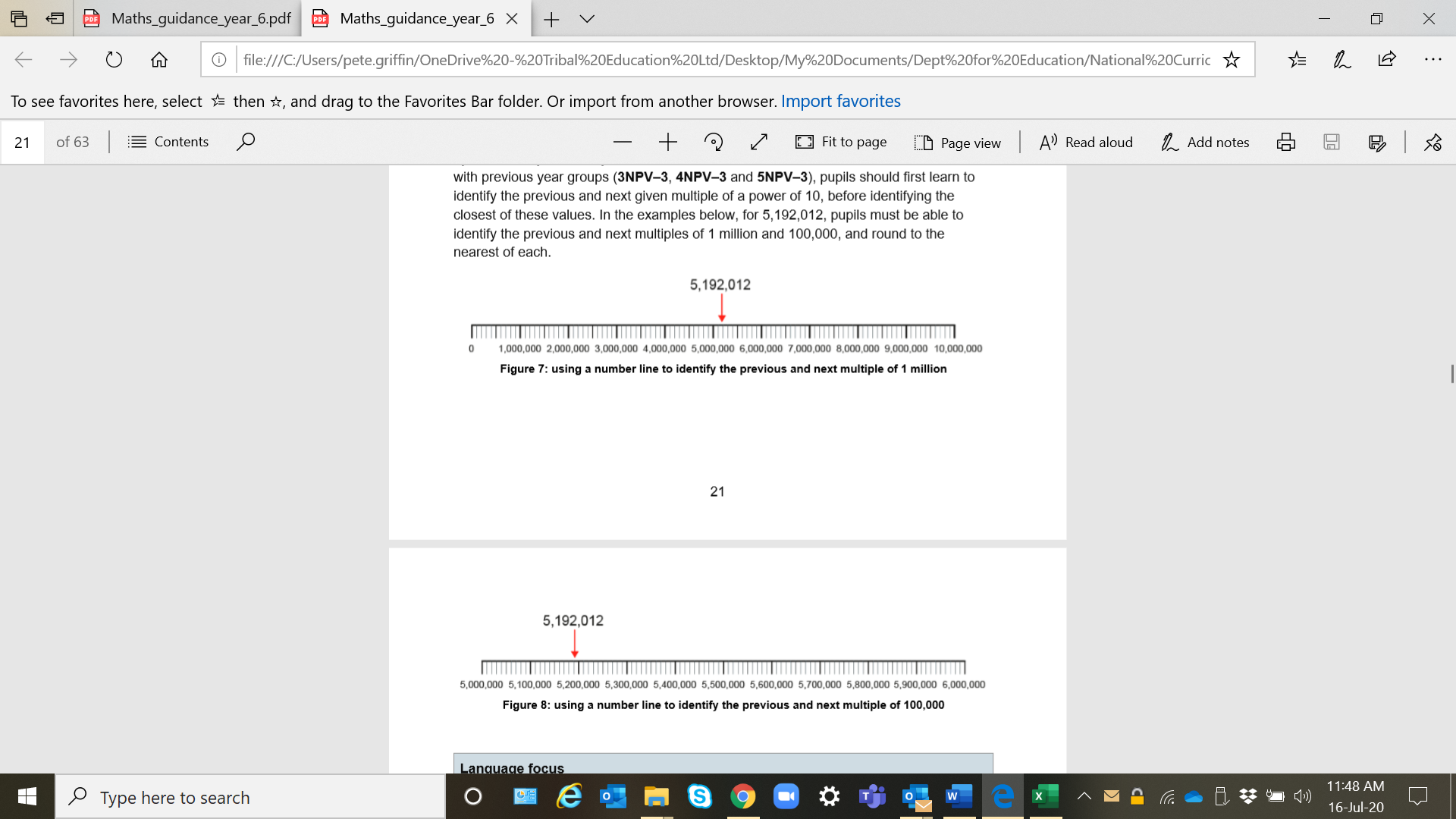
It is, of course, important that pupils know the names of the column headings in the base 10 place value system. By the end of Year 6, they need to know all of them from one hundredth through to ten million, and should be able to read and write all of these from 0.01 through to 10,000,000. However, just knowing these without an appreciation of the underlying structure that links them together is not enough.

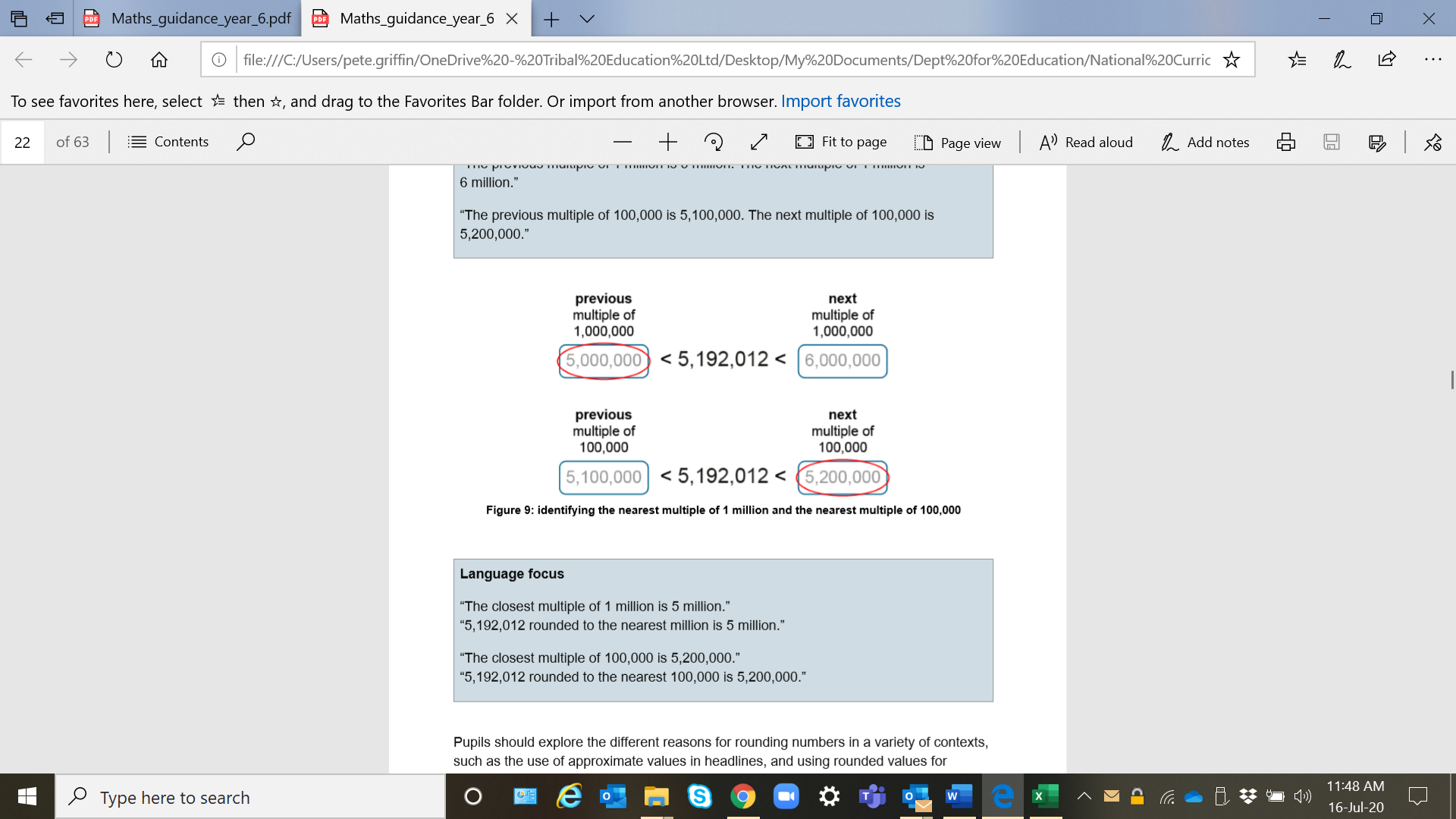
Pupils should be able to describe any of the powers of ten in relation to any other by saying things like “10,000 is a hundredth of 1,000,000” or “100 is a thousand times 0.1”. While they won’t necessarily be able to express all of the headings as powers of ten (and certainly not the decimals!) they will know that 100 is 102 and 1,000 is 103 (from Year 5) and appreciate that each column heading is a factor of 10 bigger or smaller than the adjacent one.

They should be able to talk about a number like 275,600 in a variety of ways, for example:

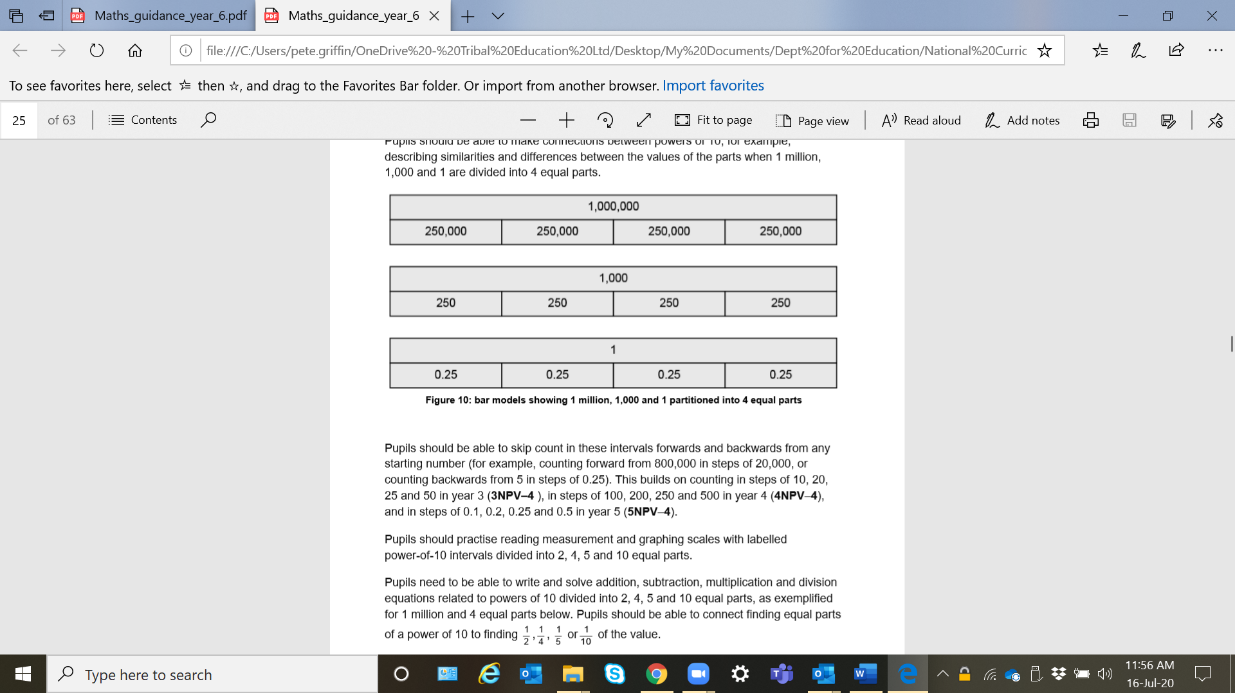
* it is 100 times bigger than 2,756
* if you divide it by 1,000 you get 275.6
* 10 times this is 2,756,000.

Another key aspect of understanding place value deeply is the ability to place numbers on a number line and the related skill of being able to identify key numbers either side of a given number and round appropriately, as in these examples from the Year 6 guidance:





Also, in preparation for work on scales and graphs at Key Stage 3, pupils need to be able to partition numbers into equal sections as in these examples from the Year 6 guidance:



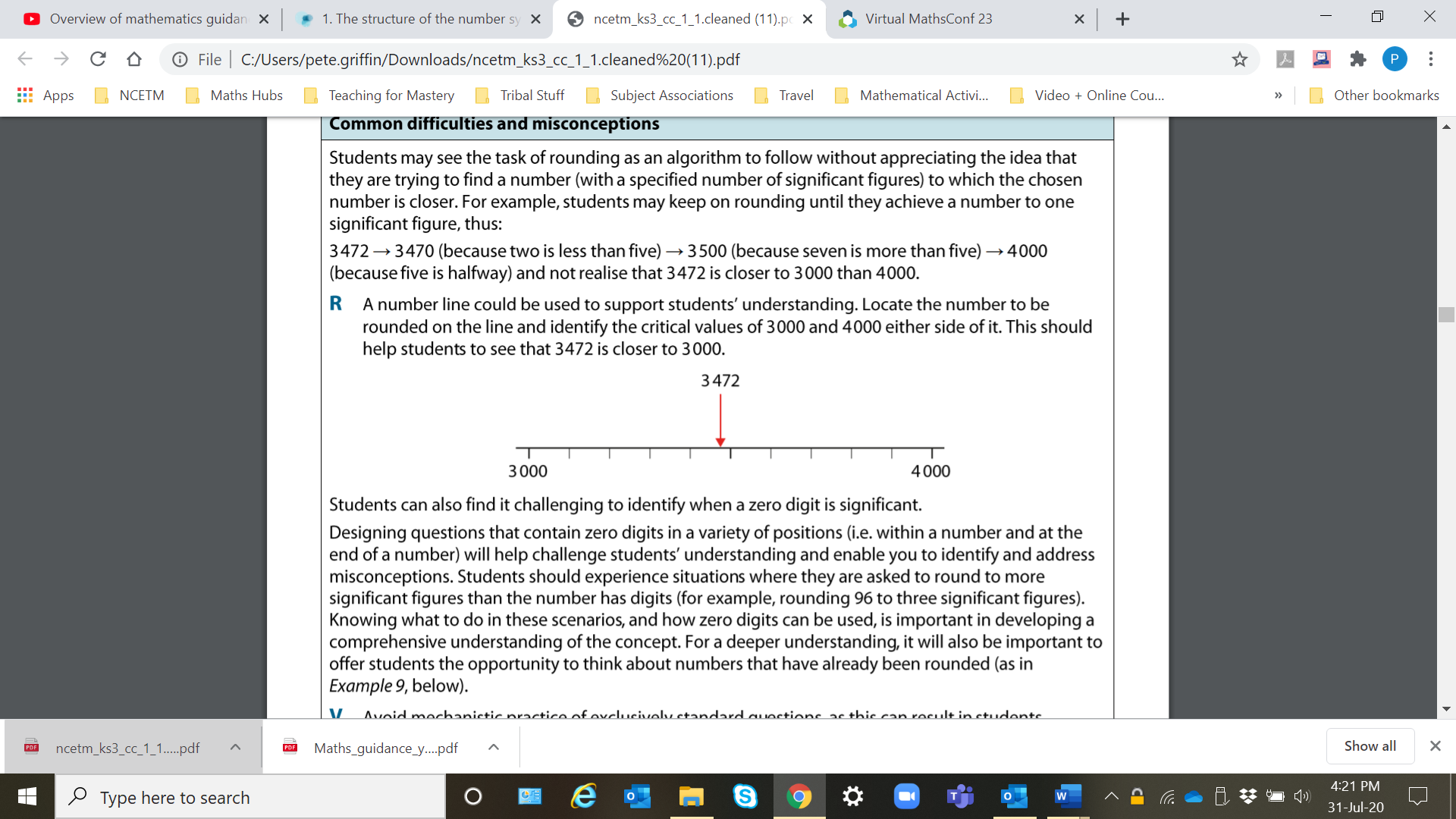
**Progression to Key Stage 3**

Two key ideas develop in Key Stage 3 for which a deep understanding of place value is needed:

* **Rounding to a number of decimal places or significant figures**

Understanding the place value system and, in particular, being able to place numbers on a number line, is crucial for a deep, conceptual understanding of rounding.

For example, once pupils are aware that when you place, for example, 3,472 on a number line between 3,000 and 4.000, it is nearer to 3,000 than 4,000, then they understand the purpose of rounding and are less likely to apply a rule mechanically.



(Taken from the Secondary Mastery PD Materials, Core Concept 1.1: Place value, estimation and rounding

<https://www.ncetm.org.uk/media/ounhep23/ncetm_ks3_cc_1_1.pdf>)

* **Interpreting and writing numbers in standard form.**

When pupils have a really deep understanding of place value and know that:

* + each place in the base 10 number system has a value 10 times bigger or smaller than the number in the adjacent place
  + multiplying and dividing by different powers of ten results in all the digits shifting to the right or left with the decimal place remaining fixed,

and

* + are able to write numbers in different ways:

e.g. 2453.12 = 245.312 × 10 = 0.245312 × 10,000 = 245,312 ÷ 100 = 2.45312 × 1000

… then they are very close to understanding the essence of standard form.

Work in Key Stage 3 can then build on this by teaching pupils to understand the meaning of 10n for positive and negative values of n and that dividing by, for example, 100 (102) is equivalent to multiplying by 0.01 (10-2).

For further guidance on these, follow the links below to the relevant documents in the [NCETM Secondary PD Materials](https://www.ncetm.org.uk/teaching-for-mastery/mastery-materials/secondary-mastery-professional-development/).

**Theme Overview:**

* [Theme 1: The structure of the number system](https://www.ncetm.org.uk/media/oconaxqx/ncetm_ks3_theme_1.pdf)

Theme 1 explores the key structures of number and the number system, such as place value, factors, multiples, and powers.

**Core Concept documents:**

* [Core Concept 1.1: Place value, estimation and rounding](https://www.ncetm.org.uk/media/ounhep23/ncetm_ks3_cc_1_1.pdf)

This core concept covers the structure of our place value system (particularly as it relates to decimals) and rounding numbers to a required number of decimal places or significant figures.

* [Core Concept 1.3: Ordering and comparing](https://www.ncetm.org.uk/media/xp2m3gio/ncetm_ks3_cc_1_3.pdf)

This core concept covers the conversion of decimals to fractions (and vice versa), ordering positive and negative integers, fractions and decimals, and the expression of numbers in standard form.

August 2020