## Unit Overview and Guidance

- The exemplification has been taken from the NCETM online 'Resource Toolkit', with additions in order to ensure full coverage
 may not enable you to work through every step in the correct order for every year group, the steps can help you identify a 'best fit' for your class as a whole. Many thanks go to the White Rose Maths hub for permission to include their resources. A summary of these 'small steps' for each tear group is included in the pink section below.
- The NCETM reasoning questions have also been incorporated into each unit and are identified in pale purple boxes underneath the group of the most relevant objectives
 included for easy reference.
- Hyperlinks to NRich activities have also been added to this version. These are found by clicking on the blue buttons like this one $\square$ at the bottom of relevant objective
- Some additional content has been added in order to support mixed-aged planning. Any additional content is in italics. Occasionally strikethrough has been used to identify when an objective has been altered and this is primarily where an objective has been split between two units or into several small steps.
- Each unit is sub-divided into sections for ease of planning. Sub-categories in this unit are;


## 1. Counting

2. Read, write, order and compare numbers
3. Place value (see also fractions, decimals and percentages)
4. Identify, represent, estimate and round
5. Solve problems

|  | Yr 3 | Yr 4 | Yr 5 | Yr 6 |
| :---: | :---: | :---: | :---: | :---: |
|  | The Big Ideas <br> The value of a digit is determined by its position in a number. <br> Place value is based on unitising, treating a group of things as one 'unit'. This generalises to 3 units +2 units $=5$ units (where the units are the same size). | The Big Ideas <br> Imagining the position of numbers on a horizontal number line helps us to order them: the number to the right on a number line is the larger number. So 5 is greater than 4 , as 5 is to the right of 4 . But -4 is greater than -5 as -4 is to the right of -5 . <br> Rounding numbers in context may mean rounding up or down. Buying packets of ten cakes, we might round up to the nearest ten to make sure everyone gets a cake. <br> Estimating the number of chairs in a room for a large number of people we might round down to estimate the number of chairs to make sure there are enough. <br> We can think of place value in additive terms: 456 is $400+50+6$, or in multiplicative terms: one hundred is ten times as large as ten. | The Big Ideas <br> Large numbers of six digits are named in a pattern of three: hundreds of thousands, tens of thousands, ones of thousands, mirroring hundreds, tens and ones. <br> It is helpful to relate large numbers to real-world contexts, for example the number of people that a local sports arena can hold. | The Big Ideas <br> For whole numbers, the more digits a number has, the larger it must be: any 4-digit whole number is larger than any 3-digit whole number. But this is not true of decimal numbers: having more digits does not make a decimal number necessarily bigger. For example, 0.5 is larger than 0.35 . <br> Ordering decimal numbers uses the same process as for whole numbers i.e. we look at the digits in matching places in the numbers, starting from the place with the highest value i.e. from the left. The number with the higher different digit is the higher number. For example, 256 is greater than 247 because 256 has 5 tens but 247 has only 4 tens. Similarly 1.0843 is smaller than 1.524 because 1.0843 has 0 tenths but 1.524 has 5 tenths. |
|  | Teaching for Mastery Year 3 | Teaching for Mastery Year 4 | Teaching for Mastery Year 5 | Teaching for Mastery Year 6 |

## NUMBER: Number and place value (NPV - 4 weeks)

| Strand |  | Yr3 | Yr4 | Yr5 | Yr6 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{aligned} & \text { O } \\ & \underset{E}{y} \\ & \frac{1}{3} \\ & 0 \end{aligned}$ |  | count from 0 in multiples of 4, 8,50 and 100; <br> Hundreds <br> Count in 50s <br> a) Count on from zero in steps of $2,3,4,5$, 8,50, 100; | count in multiples of 6, 7, 9, 25 and 1000 <br> Count in 1000s <br> Count in 25s <br> Explain how to work out the 6 times-table from the 3 times-table or the 9 times-table from the 3 times-table. <br> Know that $9 \times 8=72$ so that $72 \div 9=8$ and deduce $720 \div 9$. <br> Explain the relationship between $8 \times 7=56,6$ $\times 7=42$ and $14 \times 7=98$. | count forwards or backwards in steps of powers of 10 for any given number up to 1000 000 <br> Count in powers of 10 <br> Count from any given number in powers of 10 and decimal steps extending beyond zero when counting backwards; relate the numbers to their position on a number line <br> Write the next number in this counting sequence: $110000,120000,130000 \ldots$ <br> Create a sequence that goes backwards and forwards in tens and includes the number 190. <br> Describe your sequence. <br> Here is part of a sequence: $30,70,110, \square, 190, \square$. How can you find the missing numbers? <br> interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through 0 <br> Negative numbers <br> Count from any given number in whole-number and decimal steps extending beyond zero when counting backwards; relate the numbers to their position on a number line. <br> Spot the mistake: <br> 177000,187000,197000,217000 <br> What is wrong with this sequence of numbers? <br> True or False? <br> When I count in 10's I will say the number 10100 <br> What comes next? $\begin{aligned} & 646000-10000=636000 \\ & 636000-10000=626000 \\ & 626000-10000=616000 \end{aligned}$ |  |
|  | N | find 10 or 100 more or less than a given number <br> 1, 10, 100 more or less <br> Give me the number 100 less than 756 | find 1000 more or less than a given number 1000 more or less <br> Answer questions such as, what is the missing number in the number sentence and how do you know? $5742+\leq=9742$ |  |  |
|  |  |  | count backwards through zero to include negative numbers <br> Negative numbers <br> Create a sequence that includes the number -5 and then describe the sequence to the class. <br> Explain how to find the missing numbers in a sequence <br> eg. $\quad-9,-5,-1, \ldots$ and explain the rule. <br> Answer questions eg What number can you put in the box to make this statement true? _ < -2 |  | use negative numbers in context, and calculate intervals across zero <br> Negative numbers <br> work with negative numbers in a similar way, determining values on a scale and estimating. |
|  |  | Spot the mistake: $50,100,115,200$ <br> What is wrong with this sequence of numbers? <br> True or False? <br> 38 is a multiple of 8 <br> What comes next? $\begin{aligned} & 936-10=926 \\ & 926-10=916, \\ & 916-10=906 \end{aligned}$ | Spot the mistake: $950,975,1000,1250$ <br> What is wrong with this sequence of numbers? <br> True or False? <br> 324 is a multiple of 9 <br> What comes next? $\begin{aligned} & 6706+1000=7706 \\ & 7706+1000=8706 \\ & 8706+1000=9706 \end{aligned}$ |  | Spot the mistake: $-80,-40,10,50$ <br> What is wrong with this sequence of numbers? <br> True or False? <br> When I count backwards in 50s from 10 I will say -200 <br> True or False? <br> The temperature is -3 . It gets 2 degrees warmer. The new temperature is -5 |

NUMBER: Number and place value (NPV - 4 weeks)

|  |  | read and write numbers up to 1000 in numerals and words <br> Numbers to 1000 <br> Read these numbers 428, 205, 25, 7, 909 <br> compare and order numbers up to 1000 <br> Comparing objects <br> Comparing numbers <br> Compare and order <br> Sort these numbers into ascending order: $95,163,8,740,25,0,400,303$ <br> identify, represent and estimate numbers using different representations <br> Number line to 1000 <br> Show me 642 on a number line, with Dienes apparatus etc. <br> What number is halfway between 65 and 95? How do you know? |
| :---: | :---: | :---: |
|  |  |  |
|  |  | Do, then explain <br> $835 \quad 535 \quad 538 \quad 388 \quad 508$ <br> If you wrote these numbers in order starting with the smallest, which number would be third? <br> Explain how you ordered the numbers. |

order and compare numbers beyond 1000 Compare 4 digit numbers

## Ordering numbers

Children can find numbers that could go in the boxes to make these correc

$$
+\square<2000,3000>\square-\square
$$

identify, represent and estimate numbers using different representations

## Number line to 10000

which of these numbers is closest to the answer of 342-119:

200220230250300
Identify what the digit 7 represents in each of these amounts:
$£ 2.70,7.35 \mathrm{~m}, £ 0.37,7.07 \mathrm{~m}$
read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value

## Roman numerals

Convert from Roman numeral to our current system (Arabic) and from Arabic to Roman e.g $76=$ _ in Roman numerals, CLXIX =_Arabic numerals.
Know that the current western numeral system is the modified version of the Hindu numeral system developed in India to include the concept of zero \& place value.

## Do, then explain <br> 50355053535055305503

If you wrote these numbers in order starting with the largest, which number would be third?

Explain how you ordered the numbers.
read, write, order and compare numbers to at least 1000000 and determine the value of each digit

## Numbers to 10000

Numbers to 100000
Compare and order (100 000)
Numbers to 1000000

## Compare and order (1000 000

Answer problems such as

- What is the value of the 7 in 3274 105?
- Write in figures forty thousand and twenty.
- A number is partitioned like this:
$4000000+200000+60000+300+50+8$ Write the number. Now read it to me.
- A car costs more than $£ 8600$ but less than
$£ 9100$. Tick the prices that the car might cost.
£8569 ■ £9090 ■ £9130 ■ £8999 -
read Roman numerals to $1000(\mathrm{M})$ and recognise years written in Roman numerals


## Roman numerals

Recognise Roman numerals in their historica context

Read and write Roman numerals to one thousand

## Do, then explain <br> $$
56743
$$

Explain
Make up an example/Give further examples
Create six digit numbers where the digit sum is five and the thousands digit is two

$$
\text { e.g. } 3002000 \quad 2102000
$$

What is the largest/smallest number?

## Do, then explain

747014, 774014, 747017, 774077, 744444 If you wrote these numbers in order starting with the smallest, which number would be third?
read, write, order and compare numbers up to 10000000 and determine the value of each digit (1)

## Numbers to ten million

## Compare and order any number

Children should be able to determine the steps used in different scales, and so complete activities such as -


NUMBER: Number and place value (NPV - 4 weeks)

| $\frac{\frac{0}{7}}{\frac{\pi}{8}}$ | ¢ | recognise the place value of each digit in a three-digit number (hundreds, tens, ones) <br> $100 \mathrm{~s}, 10 \mathrm{~s}$ and 1 s (1) <br> $100 \mathrm{~s}, 10 \mathrm{~s}$ and 1 s (2) <br> For each of these numbers: 428, 205, 130, 25, 7, 909, tell me: How many hundreds? How many tens it has? How many ones? |
| :---: | :---: | :---: |
| $\begin{aligned} & \text { U } \\ & \frac{\widetilde{0}}{\square} \end{aligned}$ |  | (Year 4 objective) find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths $\text { e.g. } 73 \div 10=7.3 \text { and } 7 \div 10=0.7$ <br> Respond to oral or written questions such as: <br> How many times larger is 260 than 26 ? <br> How many $£ 1$ notes are in $£ 120$ ? <br> Divide 390 ninety by ten. <br> Write in the missing number $\square$ $\div 10=0.6$ |

recognise the place value of each digit in
four-digit number (thousands, hundreds, tens, and ones)
$1000 \mathrm{~s}, 100 \mathrm{~s}, 10 \mathrm{~s}$ and 1 s

## Partitioning

Give the value of a digit in a given number e.g. the 7 in 3274
Write in figures a given number e.g. four thousand and twenty.
Recognise a number partitioned like this: 4000 $+200+60+3$ and be able to read and write the number.
Create the biggest and smallest whole number given four digits eg. 3, 0, 6, 5
Find missing numbers in a number sentence
e.g. $\quad+=1249$
find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths

## Divide 1 digit by 10

## Divide 2 digits by 10

Divide 1 or 2 digits by 100
Describe the pattern.
26, 2.6, 0.26, 0.026
Respond to oral or written questions such as
How many times larger is 2600 than 26 ? How many £1 notes are in $£ 120, £ 1200$ ?

Divide three hundred and ninety by ten.
(Year 6 objective) identify the value of each digit to three decimal places
Year 5 Decimals up to 2 d.p.
Year 5 Understanding thousandths
multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000

## Multiplying by 10,100 and 1000

## Dividing by 10, 100 and 1000

Multiples of 10, 100 and 1000
Multiply decimals by 10, 100 and 1000

## Divide decimals by 10, 100 and 1000

Recall quickly multiplication facts up to $10 \times 10$ and use them to multiply pairs of multiples of 10 and 100
The product is 400 . At least one of the numbers is a multiple of 10 . What two numbers could have been multiplied together? Are there any other possibilities?
identify the value of each digit to three decimal places

## Three decimal places

Children should be able to identify the value of each digit in the number 17.036
multiply and divide numbers by 10, 100 and 000 where the answers are up to three decimal places
Multiply by 10,100 and 1000

## Divide by 10,100 and 1000

Children should be able to identify the value of each digit in the number 17.036 and multiply and divide this by 10 and 100 and 1000

NUMBER: Number and place value (NPV - 4 weeks)


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Possible answers
A number rounded to the nearest ten is 540 . What is the smallest possible number it could be?

## What do you notice?

Round 296 to the nearest 10. Round it to the nearest 100. What do you notice? Can you suggest other numbers like this?

## Do, then explain

Circle each decimal which when rounded to the nearest whole number is 5 .
$\begin{array}{llll}5.3 & 5.7 & 5.2 & 5.8\end{array}$

## Explain your reasoning

## Top tips

Explain how to round numbers to one decimal place?
solve number and practical problems that involve all of the above and with increasingly large positive numbers

Children should be able to sort problems into those they would do mentally and those they would do with pencil and paper and explain their decisions.

There are 70 children on a camping trip. Each tent can accommodate up to 6 children. What is the smallest number of tents they will need?

The distance to the park is 5 km when rounded to the nearest kilometre. What is the
longest/shortest distance it could be?

