Unit Overview and Guidance

- The exemplification has been taken from the NCETM online 'Resource Toolkit', with additions in order to ensure full coverage.
- Links to the White Rose Maths hubs schemes of work are hyperlinked to each of the objectives. These are numbered by 'steps' to help you plan for progression. Whilst the logistics of a mixed age class 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.
- The 'big Ideas' sections from the NCETM 'Teaching for Mastery' documents have been included at the start of each unit. Hyperlinks to the full NCETM 'Teaching for Mastery' documents have also been 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 1 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
NCETM Teaching for Mastery estions, tasks and activities to support assessment	The Big Ideas The value of a digit is determined by its position in a number. 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 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. 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. 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. 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 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. 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 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. 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.
Que	Teaching for Mastery Year 3	Teaching for Mastery Year 4	Teaching for Mastery Year 5	Teaching for Mastery Year 6





Strand		Yr3	Yr4	Yr5	Yr6
	Counting	count from 0 in multiples of 4, 8, 50 and 100; <u>Hundreds</u> <u>Count in 50s</u> a) Count on from zero in steps of 2, 3, 4, 5, 8, 50, 100;	count in multiples of 6, 7, 9, 25 and 1000Count in 1000sCount in 25sExplain how to work out the 6 times-table from the 3 times-table or the 9 times-table from the 3 times-table.Know that $9 \times 8 = 72$ so that $72 \div 9 = 8$ and deduce $720 \div 9$.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 1 000 000 <u>Count in powers of 10</u> 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 Write the next number in this counting sequence: 110 000, 120 000, 130 000 Create a sequence that goes backwards and forwards in tens and includes the number 190. Describe your sequence. Here is part of a sequence: 30, 70, 110, □, 190, □.	
ıting	More, Less	find 10 or 100 more or less than a given number 1, 10, 100 more or less Give me the number 100 less than 756	find 1000 more or less than a given number 1000 more or less Answer questions such as, what is the missing number in the number sentence and how do you know? $5742 + \le 9742$ count backwards through zero to include	How can you find the missing numbers?	use negative numbers in context, and
Counting	Negative Numbers		negative numbers Negative numbers Create a sequence that includes the number -5 and then describe the sequence to the class. Explain how to find the missing numbers in a sequence eg. $-9, -5, -1, -$ and explain the rule. Answer questions eg What number can you put in the box to make this statement true? -2	forwards and backwards with positive and negative whole numbers, including through 0 <u>Negative numbers</u> 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.	calculate intervals across zero Negative numbers work with negative numbers in a similar way, determining values on a scale and estimating.
	NCETM Reasoning	Spot the mistake : 50,100,115,200 What is wrong with this sequence of numbers? True or False? 38 is a multiple of 8 What comes next? 936-10= 926, 926 -10 = 916, 916- 10= 906	Spot the mistake: 950, 975,1000,1250 What is wrong with this sequence of numbers? True or False? 324 is a multiple of 9 What comes next? 6706+ 1000= 7706 7706 + 1000 = 8706 8706 + 1000 = 9706	Spot the mistake: 177000,187000,197000,217000 What is wrong with this sequence of numbers? True or False? When I count in 10's I will say the number 10100 What comes next? 646000-10000= 636000 636000 -10000 = 626000 626000- 10000 = 616000	Spot the mistake: -80,-40,10,50 What is wrong with this sequence of numbers? True or False? When I count backwards in 50s from 10 I will say -200 True or False? The temperature is -3. It gets 2 degrees warmer. The new temperature is -5





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compare numbers	Arabic Numerals	read and write numbers up to 1000 in numerals and wordsNumbers to 1000Read these numbers 428, 205, 25, 7, 909compare and order numbers up to 1000Comparing objectsComparing numbersCompare and orderSort these numbers into ascending order: 95, 163, 8, 740, 25, 0, 400, 303identify, represent and estimate numbers using different representationsNumber line to 1000Show me 642 on a number line, with Dienes apparatus etc.What number is halfway between 65 and 95? How do you know?	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 correct + < 2000, 3000 > identify, represent and estimate numbers using different representations Number line to 10 000 which of these numbers is closest to the answer of 342 - 119: 200 220 230 250 300 Identify what the digit 7 represents in each of these amounts: £2.70, 7.35m, £0.37, 7.07m	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit <u>Numbers to 10 000</u> <u>Numbers to 100 000</u> <u>Compare and order (100 000)</u> <u>Numbers to 1 000 000</u> <u>Compare and order (1 000 000)</u> Answer problems such as • What is the value of the 7 in 3 274 105? • Write in figures forty thousand and twenty. • A number is partitioned like this: 4 000 000 + 200 000 + 60 000 + 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, write, order and compare numbers up to 10 000 000 and determine the value of each digit (1) <u>Numbers to ten million</u> <u>Compare and order any number</u> Children should be able to determine the steps used in different scales, and so complete activities such as - 960 980
e, order and	Roman Numerals		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.	read Roman numerals to 1000 (M) and recognise years written in Roman numerals <u>Roman numerals</u> Recognise Roman numerals in their historical context Read and write Roman numerals to one thousand	
	NCETM Reasoning	Do, then explain 835 535 538 388 508 If you wrote these numbers in order starting with the smallest, which number would be third? Explain how you ordered the numbers.	Do, then explain 5035 5053 5350 5530 5503 If you wrote these numbers in order starting with the largest, which number would be third? Explain how you ordered the numbers.	Do, then explainShow the value of the digit 5 in these numbers?350114567432985376Explain how you know.Make up an example/Give further examplesCreate six digit numbers where the digit sum is fiveand the thousands digit is two.e.g. 30020002102000What is the largest/smallest number?Do, then explain747014, 774014, 747017, 774077, 744444If you wrote these numbers in order starting withthe smallest, which number would be third?	 Do, then explain Show the value of the digit 6 in these numbers? 6787555 95467754 Explain how you know. Make up an example Create seven digit numbers where the digit sum is six and the tens of thousands digit is two. E.g. 4020000 What is the largest/smallest number? Do, then explain Find out the populations in five countries. Order the populations starting with the largest. Explain how you ordered the countries and their populations.



: value Place Value	recognise the place value of each digit in a three-digit number (hundreds, tens, ones) <u>100s, 10s and 1s (1)</u> <u>100s, 10s and 1s (2)</u> For each of these numbers: 428, 205, 130, 25, 7, 909, tell me: How many hundreds? How many tens it has? How many ones? <u>1</u> 2	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)1000s, 100s, 10s and 1sPartitioningGive the value of a digit in a given number e.g. the 7 in 3 274Write in figures a given number e.g. four thousand and twenty.Recognise a number partitioned like this: 4 000 + 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, 5Find missing numbers in a number sentence e.g+ = 1249122<	(Year 6 objective) identify the value of each digit to three decimal places Year 5 <u>Decimals up to 2 d.p.</u> Year 5 <u>Understanding thousandths</u>	identify the value of each digit to three decimal places <u>Three decimal places</u> Children should be able to identify the value of each digit in the number 17.036
Place Multiplying and dividing by powers of ten	Write in the missing number	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 <u>Divide 1 digit by 10</u> <u>Divide 2 digits by 10</u> <u>Divide 1 or 2 digits by 100</u> 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.	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 Multiply decimals by 10, 100 and 1000 Multiply decimals by 10, 100 and 1000 Divide decimals by 10, 100 and 1000 Divide decimals by 10, 100 and 1000 Recall quickly multiplication facts up to 10 x 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?	multiply and divide numbers by 10, 100 and1000 where the answers are up to threedecimal placesMultiply by 10, 100 and 1000Divide by 10, 100 and 1000Children should be able to identify the value ofeach digit in the number 17.036 and multiplyand divide this by 10 and 100 and 1000





	NCETM Reasoning	Do, then explain Show the 3 value of the digit 3 in these numbers? 341 503 937 Explain how you know. Make up an example Create numbers where the digit sum is three. Eg 120, 300, 210 What is the largest/smallest number?	 Do, then explain Show the value of the digit 4 in these numbers? Explain how you know. 3041 4321 5497 Make up an example Create four digit numbers where the digit sum is four and the tens digit is one. E.g. 1210, 2110, 3010. What is the largest/smallest number? Undoing I divide a number by 100 and the answer is 0.3. What number did I start with? 	Making links $7 \times 8 = 56$ How can you use this fact to solve these calculations? $0.7 \times 0.8 = 5.6 \div 8 =$ UndoingI divide a number by 100 and the answer is 0.33What number did I start with?Another and anotherWrite down a number with two decimal places which when multiplied by 100gives an answer between 33 and 38 and another, and another,	True or false? In all of the numbers below, the digit 6 is worth <u>more than</u> 6 hundredths. 3.6, 3.063, 3.006, 6.23, 7.761, 3.076 Is this true or false? Change some numbers so that it is true. What needs to be added to 6.543 to give 7? What needs to be added to 3.582 to give 5? Circle the two decimals which are closest in value to each other. 0.9 0.09 0.99 0.1 0.01
		(Year 4 objective) round any number to the nearest 10	round any number to the nearest 10, 100 or 1000	round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000	round any whole number to a required degree of accuracy
		Children should be able to explain tips to give someone who is learning how to round	Round to the nearest 10	Round to the nearest 10, 100 and 1000	Rounding numbers
		numbers to the nearest 10.	Round to the nearest 100 Round to the nearest 1000	Round any numbers within 100 000 Round numbers to 1 000 000	Children should be able to circle the best estimate of the answer to questions such as;
Rounding	Rounding	I rounded a number to the nearest 10. The answer is 50. What number could I have started with? Know what to look for first when you order a set of numbers and know which part of each number to look at to help you. Know which multiple of 10 is closest to a number.	Children should be able to explain tips to give someone who is learning how to round numbers to the nearest 10, 100 or 1000. I rounded a number to the nearest 10. The answer is 340. What number could I have started with? Know what to look for first when you order a set of numbers and know which part of each number to look at to help you.	 Explain what each digit represents in whole numbers and decimals with up to two places and partition round and order these numbers and answer questions such as: What is 4773 rounded to the nearest hundred? round decimals with two decimal places to the nearest whole number and to one decimal place Rounding decimals Round these to one decimal place 	 72.34 ÷ 8.91 When given 6, 7, 8, 9, 10, 11 as possible answers Children should estimate the position of numbers on a number line. They should suggest which number lies about two-fifths of the way along a line from 0 to 1000, or a line from 0 to 1. They should be able to justify their decisions.
			Round decimals	9.78, 27.34, 39.95	
			Round these to the nearest whole number: 9.7, 25.6, 148.3		
			Round these lengths to the nearest metre: 1.5m, 6.7m, 4.1m, 8.9m		
			Round these costs to the nearest £: £3.27, £12.60, £14.05, £6.50		
			1		





		Possible answers	Possible answers	Possible answers	Possible answers
		A number rounded to the nearest ten is 540. What is the smallest possible number it could be?	A number rounded to the nearest ten is 540. What is the smallest possible number it could be?	A number rounded to the nearest thousand is 76000. What is the largest possible number it could be?	Possible answersTwo numbers each with two decimal places round to 23.1 to one decimal place. The total of the numbers is 46.2. What could the numbers be?What do you notice?Give an example of a six digit number which rounds to the same number when rounded to the nearest 10000 and 100000Do, then explainWrite the answer of each calculation rounded to the nearest whole number75.7 x 597734 ÷ 60772.4 x 9.720.34 x (7.9 – 5.4)What's the same, what's different?when you round numbers to one decimal place
		What do you notice?	What do you notice?	What do you notice?	
	NCETM Reasoning	Round 296 to the nearest 10. Round it to	Round 296 to the nearest 10. Round it to the nearest 100. What do you notice? Can you suggest other numbers like this?	Round 343997 to the nearest 1000. Round it to the nearest 10000. What do you notice? Can you suggest other numbers like this?	Give an example of a six digit number which rounds to the same number when rounded to
	Rea	the nearest 100. What do you notice? Can	Do, then explain	Do, then explain	
	TM	you suggest other numbers like this?	Circle each decimal which when rounded to the	Circle each decimal which when rounded to one	
	NCE		nearest whole number is 5.	decimal place is 6.2.	
			5.3 5.7 5.2 5.8	6.32 6.23 6.27 6.17	75.7 × 59 7734 ÷ 60
			Explain your reasoning Top tips	Explain your reasoning Top tips	772.4 × 9.7 20.34 × (7.9 – 5.4)
			Explain how to round numbers to one decimal	Explain how to round decimal numbers to one	What's the same, what's different?
			place?	decimal place?	and two decimal places?
		solve number problems and practical problems involving these ideas	 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? 	solve number problems and practical problems that involve all of the above	
Solve problem		a) Jack walks 645 metres to school. Suzy walks 100 metres less. How far does Suzy walk?		Partition decimals using both decimal and fraction notation for example recording 6.38 as $6 + \frac{3}{10} + \frac{8}{10}$ and as $6 + 0.3 + 0.08$.	inverse operations to estimate and check
	ms	b) What is 1 more than 485? Than 569? Than 299?		Write a decimal given its parts: e.g. record the number that is made from 4 wholes 2 tenths and 7 hundredths as 4.27. Apply understanding in	The temperatures outside the aeroplane is - 30°C. What is the difference between these
	oble	c) What number needs to go into each triangle? Explain why?		activities such as:	temperatures?
	ng Pi	$642 = 600 + \Delta + 2967 = \Delta + 60 + 7$		• Find the missing number in $17.82 - \Box =$	
	Solving Problems			 17.22 Play 'Zap the digit': In pairs choose a decimal to enter into a calculator e.g. 47.25. Take turns to 'zap' (remove) a particular digit using subtraction. For example, to 'zap' the 2 in 47.25 subtract 0.2 to leave 47.05. 	
		1 2 3 4 5 6 7 8 9 X		The children explain how they work out calculations showing understanding of the place value that underpins written methods.	1



