St John's CE Primary School
Progression in Skills and Vocabulary with Associated Reasoning
EYFS-Y6

Number: Place Value & Number Facts Strands
(includes Ready to Progress Criteria)

Completed July 2022

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Vocabulary Progression

The following section of this document lists mathematical vocabulary and phrases that children are required to understand and use as they move through the school for this strand of Mathematics. It is based on the published 2014 national curriculum, NCETM guidance and White Rose Maths. It lists the new vocabulary in the year in which it should be explicitly used and taught. Vocabulary from previous year group should be referred to in addition to that for each year group. It is designed to assist with the teaching of vocabulary across EYFS, KS1 and KS2 and is aligned with the White Rose schemes of learning. This document identifies in which year group vocabulary should be explicitly taught and introduced. However, language should be revisited in subsequent year groups to ensure children are consolidating their understanding. This document is fully editable so language can be moved into earlier or later year groups where necessary in line with latest research findings and subject association (NCETM) updates. Some vocabulary might be introduced earlier (shapes for instance) if necessary or as part of an activity, however this document ensures coverage is progressive. It is expected that key vocabulary is displayed on 'Maths Learning Walls' at appropriate times during the academic year and in line with the current topic area being taught within the class and is promoted through mathematical talk in lessons.

Vocabulary Progression							
Place Value							
EYFS		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Nursery	Reception						
One, two, three, four, five… Verbal language necessary for numbers 1-5 More than less than / fewer than the same as / equal to,	Ordinal Compare Forwards / Backwards Numerals Digits Less than More than One more One less Same as Equal to One, two, three…to twenty Number line Subitise Double Half Twice as many Equal Unequal Share Group Odd Even	Twenty-one, twenty-two, twenty-three…to one hundred, First, second, third…to twentieth Forwards / Backwards Place Value Number Amount Value Odd Even Number Line Double Halve Pair Above / Below Multiples Numbers one – twenty in words Ones, tens One more / one less, Equal to More than Less than Fewer than Most / Least Larger / Smaller Between Ordering Compare	Place value Step counting Digit Numeral Ones, tens, hundreds Numbers one to one hundred in words Partition Place holder >as 'greater than' <as 'less than' Estimate / Estimation	Hundreds One hundred and one, one hundred and two…up to one thousand, Partition Multiple Roman numerals to 12 'XII'	Thousands Round Rounding Negative Negative integers Count through zero Roman numerals to 100 'C'	Million(s) Roman numerals to 1000 'M' Linear sequence Powers of 10 Interval	Numbers to ten million Interval (revisit)

Skills & Reasoning Progression

The following section of this document lists mathematical skills that children should become fluent and proficient in their knowledge, understanding and application. It also includes examples of reasoning questions that could be used by teachers to encourage pupils to apply their knowledge and to reason their understanding in order to build a deeper, more complex understanding of different mathematical concepts beyond 'rote' learning or superficial understanding. It is based on the published 2014 national curriculum, NCETM guidance and White Rose Maths. It lists the new concepts that need to be taught in each year group and is aligned and arranged in order to support teachers to understand the previous step in a particular concept and also the next step (where the children have come from and should be secure with, and how this will then be applied in future year groups). This is <u>not</u> done to enable teachers to 'move children on' to the next year group step, hence the exemplification of reasoning questions to support teaching staff to deliver a 'depth, not breadth' approach. However, preceding steps can be used to aid the delivery of intervention support if children are not secure with the previous step of learning – this is also supported by the demarcation of 'Ready to Progress Criteria'. These are criteria that pupils must be secure with from their previous year group in order to allow them to master new content in their current year group. Links to NRich activities are also provided to enable teaching staff to link in Mathematical investigation where possible.

Skill Progression							
Place Value – Counting & Identifying							
EYFS		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
3-4year olds	Reception						
Recite numbers past 5 (NRICH: Collecting)	Verbally count beyond 10, recognising the pattern of the counting system (NRICH: Collecting) *Count objects, actions and sounds*	count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number ***RPC - 1NPV–1** Count within 100, forwards and backwards, starting with any number.*			count backwards through zero to include negative numbers	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	use negative numbers in context, and calculate intervals across zero
Develop fast recognition of up to 3 objects, without having to count them individually (**subitising)** (NRICH: Collecting)	Subitise with patterns, 5 and 10 frames, dots, fingers etc to 5 (NRICH: Collecting)	Count to 100 in numerals; count in multiples of twos, fives and tens ***RPC - 1NF–2** Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples,*	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward	count from 0 in multiples of 4, 8, 50 and 100;	count in multiples of 6, 7, 9, 25 and 1 000	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	

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		*beginning with any multiple, **and count forwards and backwards through the odd numbers.***				
Say one number for each item in order: 1, 2, 3, 4, 5 Know that the last number reached when counting a small set of objects tells the total (cardinality) (NRICH: Collecting)		given a number, identify one more and one less		find 10 or 100 more or less than a given number		

Reasoning Progression - Examples

		Spot the mistake: 5,6,8,9 What is wrong with this sequence of numbers? **True or False?** I start at 2 and count in twos. I will say 9 **What comes next?** 10+1= 11 11+1= 12 12+1 = 13 ……..	**Spot the mistake:** 45,40,35,25 What is wrong with this sequence of numbers? **True or False?** I start at 3 and count in threes. I will say 13? **What comes next?** 41+5=46 46+5=51 51+5=56 ……	**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?** 6,706 + 1000= 7,706 7,706 + 1000= 8,706 8,706 + 1000 =9,706 ……	**Spot the mistake:** 177,000, 187,000, 197,000, 217,000 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?** 646,000 – 10,000= 636,000 636,000 – 10,000 = 626,000 626,000 – 10,000 = 616,000 …….	**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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Place Value - Represent

EYFS 3-4year olds	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Show finger numbers to 5	Link the number symbol with its cardinal value, up to 10	Identify and represent numbers using objects and pictorial representations	Identify, represent and estimate numbers using different representations including the number line	Identify, represent and estimate numbers using different representations	Identify, represent and estimate numbers using different representations		
Experiment with their own symbols and marks as well as numerals	Explore the composition of numbers to 10, with a deep focus on numbers 1-5.	read and write numbers from 1 to 20 in numerals and words.	read and write numbers to at least 100 in numerals and in words	read and write numbers up to 1 000 in numerals and in words		read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit (appears also in Place Value: Compare)	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit (appears also in Place Value: Understanding PV)
Link numerals and amounts (e.g. show the right number of objects to match the numeral, up to 5		Read and write numbers to 100 in numerals		read and recognize Roman numerals to XII (to aid with future measure objectives)	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.	read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	

Place Value – Understanding PV and Compare

EYFS		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
3-4year olds	Reception						
	Explore the composition of numbers to 10, with a deep focus on numbers 2-5 –	given a number, identify one more or one less	**RPC - 2NPV–1** Recognise the place value of each digit in two-digit numbers, and compose and decompose two-digit numbers using standard and non- standard partitioning.	**RPC - 3NPV–2** Recognise the place value of each digit in *three*-digit numbers, and compose and decompose *three*-digit numbers using standard and non-standard partitioning.	**RPC - 4NPV–2** Recognise the place value of each digit in *four*-digit numbers, and compose and decompose *four*-digit numbers using standard and non- standard partitioning.	**RPC - 5NPV–2** Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and non- standard partitioning.	**RPC - 6NPV–2** Recognise the place value of each digit in numbers up to 10 million, including decimal fractions, and compose and decompose numbers up to 10 million using standard and non- standard partitioning.
				RPC - 3NPV–1 Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three- digit multiples of 10.	**RPC - 4NPV–1** Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100.	**RPC - 5NPV–1** Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01.	**RPC - 6NPV–1** Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000).

						recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (copied from Fractions)	
Compare quantities using language: 'more than', 'fewer than'	Compare numbers / quantities from 0-10 using vocabulary: 'less than', 'fewer', 'the same as', 'equal to'	use the language of: equal to, more than, less than (fewer), most, least	compare and order numbers from 0 up to 100; use <, > and = signs	compare and order numbers up to 1 000	order and compare numbers beyond 1 000	order and compare numbers to at least 1 000 000	order and compare numbers up to 10 000 000
					Find 1000 more or less than a given number		
	Understand the 'one more than / one less than' relationship between consecutive numbers	*RPC - 1NPV–2* *Reason about the location of numbers to 20 within the linear number system, including comparing using < > and =*	RPC - 2NPV–2 Reason about the location of any two- digit number in the linear number system, including identifying the previous and next multiple of 10.	RPC - 3NPV–3 Reason about the location of any *three-* digit number in the linear number system, including identifying the previous and next multiple of 100 and 10.	RPC - 4NPV–3 Reason about the location of any *four-* digit number in the linear number system, including identifying the previous and next multiple of 1,000 and 100, and rounding to the nearest of each.	RPC - 5NPV–3 Reason about the location of any number with up to 2 decimals places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.	RPC - 6NPV–3 Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts.
Reasoning Examples – Understanding PV							
			Do, then explain Show the value of the digit 2 in these numbers? 32 27 92 Explain how you know.	**Do, then explain** Show the3 value of the digit 3 in these numbers? 341 503 937	**Do, then explain** Show the value of the digit 4 in these numbers? 3041 4321 5497	**Do, then explain** Show the value of the digit 5 in these numbers? 350114 567432 985376	**Do, then explain** Show the value of the digit 6 in these numbers? 6787555 95467754

				Explain how you know.	Explain how you know.	Explain how you know.	Explain how you know.
			Make up an example Create numbers where the units digit is one less than the tens digit. What is the largest/smallest number?	**Make up an example** Create numbers where the digit sum is three. Eg 120, 300, 210 What is the largest/smallest number?	**Make up an example** Create four-digit numbers where the digit sum is four and the tens digit is one. Eg 1210, 2110, 3010 What is the largest/smallest number?	**Make up an example Give further examples** Create six-digit numbers where the digit sum is five and the thousands digit is two. Eg 3002000 2102000 What is the largest/smallest number?	**Make up an example** Create seven-digit numbers where the digit sum is six and the tens of thousands digit is two. Eg 4020000 What is the largest/smallest number?

Reasoning Examples – Compare

		Do, then explain Look at the objects. (in a collection). Are there more of one type than another? How can you find out?	**Do, then explain** 37 13 73 33 3 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** 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 explain** 747014 774014 747017 774077 744444 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** Find out the populations in five countries. Order the populations starting with the largest. Explain how you ordered the countries and their populations.

Place Value – Rounding

EYFS		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
3-4yr Olds	Reception						
					round any number to the nearest 10, 100 or 1 000	round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000 *Round to the next multiple of 1 or 0.1 when using decimal numbers.	round any whole or decimal number to a required degree of accuracy

Reasoning Examples – Rounding

EYFS		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					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?	**Possible answers** A number rounded to the nearest thousand is 76000 What is the largest possible number it could be? **What do you notice?** Round 343997 to the nearest 1000. Round it to the nearest 10000. What do you notice? Can you suggest other numbers like this?	**Possible answers** Two 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 100000

Place Value – Problems

EYFS		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
3-4yr Olds	Reception						
Solve real world mathematical problems with numbers up to 5	Solve real world mathematical problems and missing number counting.	Use number facts to solve missing number problems	use place value and number facts to solve problems	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	solve number problems and practical problems that involve all of the above	solve number and practical problems that involve all of the above

Number Facts - All of statements Y1-Y6 are RPC CRITERIA and must be continually revisited throughout the year after teaching							
EYFS		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
3-4yr Olds	Reception						
	Automatically recall number bonds for numbers 0–5 and some to 10.	**1NF–1** Develop fluency in addition and subtraction facts within 10.	**2NF–1** Secure fluency in addition and subtraction facts within 10, through continued practice.	**3NF–1** Secure fluency in addition and subtraction facts that bridge 10, through continued practice.			
		1NF–2 Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers.	**1NF–2** Count forwards and backwards in multiples of 2, 5 and 10, up to 10 multiples, beginning with any multiple, and count forwards and backwards through the odd numbers. (Continued from Y1 to ensure retention of key facts)	**3NF–2** Recall multiplication facts, and corresponding division facts, in the 10, 5, 2, 4 and 8 multiplication tables, and recognise products in these multiplication tables as multiples of the corresponding number.	**4NF–1** Recall multiplication and division facts up to 12 x 12, and recognise products in multiplication tables as multiples of the corresponding number.	**5NF-1** Secure fluency in multiplication table facts, and corresponding division facts, through continued practice.	
					4NF–2 Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, and		

					interpret remainders appropriately according to the context.		
				3NF–3 Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 10).	**4NF–3** Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 100)	**5NF–2** Apply place-value knowledge to known additive and multiplicative number facts (scaling facts by 1 tenth or 1 hundredth).		