St John's CE Primary School
Progression in Knowledge, Skills and
Vocabulary in Mathematics
with Associated Reasoning
EYFS – Y6

**Addition and Subtraction Strand
(includes Ready to Progress Criteria)**

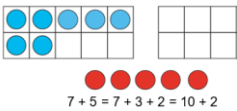Completed July 2022

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							
Addition and Subtraction							
EYFS		Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
3-4year olds	Reception						
More than Fewer than	Numeral Digit Add Plus Altogether Total More Double One more, two more, Zero Same As Equal to How many more make…? How many more is … than …? Take away Minus How many are left? How many have gone? One less, two less, ten less, How many fewer is… than…? How much less is…? Difference between Number bonds Part-whole Double Half	Sum Difference Difference between Plus Add(ition) Subtract(ion) Minus Total Adding (addend / sum) Subtraction (minuend / subtrahend) Tens column(s) Double Half / Halve Pair Estimate Compare Together Altogether Bonds Near double One less, two less, ten less One more, two more, ten more Equals / equal to Number bonds / pairs.	Digit Numeral Place Value Place holder Partition Commutative Estimate / Estimation Inverse Calculate Adding (addend / sum) Subtraction (minuend / subtrahend)	Partition Exchange Inverse Operations	Operation	Linear Sequence Interval	Interval

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 not 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.

Addition and Subtraction – Number Bonds							
3-4yr olds	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Automatically recall number bonds for numbers 0–5 *deep knowledge* and some to 10.	represent and use number bonds and related subtraction facts within 20	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 ***RPC 2AS-1 – Add and subtract across 10.**	Revisit and secure number bonds from Y1/Y2 as needed.			
		RPC - 1NF-1 - Develop **fluency** in addition and subtraction facts within 10					
Reasoning Examples – Number bonds							
		Continue the pattern 10 + 8 = 18 11 + 7 = 18 Can you make up a similar pattern for the number 17? How would this pattern look if it	**Continue the pattern** 90 = 100 – 10 80 = 100 – 20 Can you make up a similar pattern starting with the numbers 74, 26 and 100? **Missing numbers**				

included subtraction?

Missing numbers
9 + ☐ = 10
10 - ☐ = 9

What number goes in the missing box?

91 + ☐ = 100
100 - ☐ = 89

What number goes in the missing box?

Let's Discuss…

7 + 5 = 7 + 3 + 2 = 10 + 2

James' question is 7+5. How has James' method helped him to solve this equation?

Addition and Subtraction – Mental Calculations

3-4yr olds	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		add and subtract one-digit and two-digit numbers to 20, including zero	add and subtract numbers using concrete objects, pictorial representations, and mentally, including: * a two-digit number and ones * a two-digit number and tens * two two-digit numbers adding three one-digit numbers	add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds		add and subtract numbers mentally with increasingly large numbers	perform mental calculations, including with mixed operations and large numbers
			RPC – 2AS-2 – Recognise the subtraction form	**RPC – 3AS-1 –** Calculate complements to			**RPC - 6AS/MD 1-** Understand that two numbers can

			of 'difference' and answer questions of the form, "How many more…?"	100 (can use part whole / bar representation to aid this)			related additively or multiplicatively, and quantify additive or multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number)
			RPC 2AS-3 - Add and subtract within 100 by applying related one-digit addition and subtraction facts; add or subtract only ones or only tens to / from a two digit number. (also appears in written)				**RPC – 6AS/MD-2** – Use a given additive or multiplicative calculation to derive or complete a related calculation, using arithmetic properties, inverse relationships and place-value understanding.

					Reasoning Examples – Mental Calculations		
		Working backwards Through practical games on number tracks and lines ask questions such as "where have you landed?" and "what numbers would you need to throw to land	**True or false?** Are these number sentences true or false?73 + 40 = 113 98 – 18 = 70 46 + 77 = 123 92 – 67 = 35 Give your reasons.	**True or false?** Are these number sentences true or false?597 + 7 = 614 804 – 70 = 744 768 + 140 = 908 Give your reasons. **Hard and easy questions**	**True or false?** Are these number sentences true or false?6.7 + 0.4 = 6.11 8.1 – 0.9 = 7.2 Give your reasons. **Hard and easy questions**	**True or false?** Are these number sentences true or false?6.17 + 0.4 = 6.57 8.12 – 0.9 = 8.3 Give your reasons. **Hard and easy questions**	**True or false?** **Hard and easy questions** Which questions are easy / hard?

		on other given numbers?" **What do you notice?** 11 – 1 = 10 11 – 10 = 1 Can you make up some other number sentences like this involving 3 different numbers?	**Hard and easy questions** Which questions are easy / hard? 23 + 10 = 93 + 10 = 54 + 9 = 54 + 1 = Explain why you think the hard questions are hard? **Other possibilities** ☐ + ☐ + ☐ = 14 What single digit numbers could go in the boxes? How many different ways can you do this?	Which questions are easy / hard? 323 + 10 = 393 + 10 = 454 - 100 = 954 - 120 = Explain why you think the hard questions are hard?	Which questions are easy / hard? 13323 - 70 = 12893 + 300 = 19354 - 500 = 19954 + 100 = Explain why you think the hard questions are hard?	Which questions are easy / hard? 213323 - 70 = 512893 + 300 = 819354 - 500 = 319954 + 100 = Explain why you think the hard questions are hard?	213323 - 70 = 512893 + 37 = 8193.54 - 5.9 = Explain why you think the hard questions are hard?
		RPC – 1AS-2 - Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=)	show that addition of two numbers can be done in any order (commutative) and subtraction of one number				use their knowledge of the order of operations to carry out calculations involving the four operations

		symbols, and relate additive expressions to real life contexts. (appears also in Written Methods)	from another cannot			

		Fact families Which four number sentences link these numbers? 12, 15, 3 **What else do you know?** If you know this: $12 - 9 = 3$ what other facts do you know? **Missing symbols** Write the missing symbols (+ - =) in these number sentences: 17 ⬜ 3 ⬜ 20 18 ⬜ 20 ⬜ 2	**Fact families** Which four number sentences link these numbers? 100, 67, 33 **What else do you know?** If you know this: $87 = 100 - 13$ what other facts do you know? **Missing symbols** Write the missing symbols (+ - =) in these number sentences: 80 ⬜ 20 ⬜ 100 100 ⬜ 70 ⬜ 30 87 ⬜ 13 ⬜ 100				**Missing symbols** Write the missing signs (+ - x ÷) in this number sentence: 6 ⬤ 12.3 = 61.9 ⬤ 11.9 **What else do you know?** If you know this: $86.7 + 13.3 = 100$ what other facts do you know?

Addition and Subtraction – Written Calculations							
3-4yr olds	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		RPC – 1AS-1 – Compose numbers to ten from two parts, and partition numbers to ten into parts, including recognizing odd and even numbers.	**RPC – 2AS-2 –** Recognise the subtraction form of 'difference' and answer questions of the form, "How many more…?"	**RPC – 3AS-2** - add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	
		RPC – 1AS-2 - Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) symbols, and relate additive expressions to real life contexts. (appears also in Mental Calculation)	**RPC 2AS-3** - Add and subtract within 100 by applying related one-digit addition and subtraction facts; add or subtract only ones or only tens to / from a two digit number. (also appears in mental calculation)				
		add and subtract one-digit and two-digit numbers to 20, including zero	**RPC 2AS-4** - Add and subtract within 100 by applying related one-digit addition and subtraction facts; add and subtract any 2 digit numbers.				
Reasoning Examples – Written Calculations							
		Convince me	**Convince me**	**Convince me**	**Convince me**	**Convince me**	**Convince me**

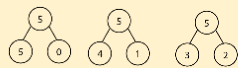|						
		In my head I have two odd numbers with a difference of 2. What could they be? Convince me **Missing numbers** Fill in the missing numbers (using a range of practical resources to support) 12 + ☐ = 19 20 - ☐ = 3 **Let's Discuss…** Let's see how many ways we can partition five… How many ways do you think we *might* find? Have we found all of the ways? Can you do this using the part-whole / bar model representation?	What digits could go in the boxes? 7☐ - 2☐ = 46 Try to find all of the possible answers. How do you know you have got them all? Convince me	☐☐ + ☐☐ + ☐☐ The total is 201 Each missing digit is either a 9 or a 1. Write in the missing digits. Is there only one way of doing this or lots of ways? Convince me	☐ - 666 = 8 5 What is the largest possible number that will go in the rectangular box? What is the smallest? Convince me	☐ + 1475 = 6☐ 24 What numbers go in the boxes? What different answers are there? Convince me	Three four-digit numbers total 12435. What could they be? Convince me

Addition and Subtraction – Inverse Operations, Estimating and Checking Answers

3-4yr olds	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	estimate the answer to a calculation and use inverse operations to check answers	estimate and use inverse operations to check answers to a calculation	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.
				RPC – 3AS-3 – Manipulate the additive relationship: Understand the inverse relationship between addition and subtraction and how both relate to the part-part-whole structure. Understand the commutative property of addition and understand the related property for subtraction.			

Reasoning Examples

Making an estimate	Making an estimate	Making an estimate	Making an estimate	Making an estimate	Making an estimate
Pick (from a selection of number sentences) the ones where the answer is 8 or 9. **Is it true that?** Is it true that 3+4 = 4 + 3?	Which of these number sentences have the answer that is between 50 and 60? 74 - 13 55 + 17 87 – 34 **Always, sometimes, never** Is it always, sometimes or never true that if you add three numbers less than 10 the answer will be an odd number	Which of these number sentences have the answer that is between 50 and 60 174 - 119 333 – 276 932 - 871 **Always, sometimes, never** Is it always, sometimes or never true that if you subtract a multiple of 10 from any number the units digit of that number stays the same. Is it always, sometimes or never true that when you add two numbers together you will get an even number	Which of these number sentences have the answer that is between 550 and 600 1174 - 611 3330 – 2779 9326 – 8777 **Always, sometimes, never** Is it always sometimes or never true that the difference between two odd numbers is odd.	Which of these number sentences have the answer that is between 0.5 and 0.6 11.74 - 11.18 33.3 – 32.71 **Always, sometimes, never** Is it always, sometimes or never true that the sum of four even numbers is divisible by 4.	Circle the number that is the best estimate to 932.6 - 931.05 1.3 1.5 1.7 1.9 **Always, sometimes, never** Is it always, sometimes or never true that the sum of two consecutive triangular numbers is a square number

Addition and Subtraction – Problems

3-4yr olds	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Subitise.	solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as	solve problems with addition and subtraction: * using concrete objects and pictorial representations, including those involving	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

		7 = □ - 9	numbers, quantities and measures applying their increasing knowledge of mental and written methods			
			solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change (copied from Measurement)			Solve problems involving addition, subtraction, multiplication and division RPC – 6AS/MD-3 – Solve problems involving ratio relationships.
	Link the number symbol (numeral) with its cardinal number value.					RPC – 6AS/MD-4 – Solve problems with 2 unknowns.