St Paul's CE Primary School

Article 28 – The right to an education.

Article 29 – Education must develop every child's talents and encourage the respect for human rights

Caring about learning, Learning about caring

Maths St Paul's CE Primary – Progression themes – Addition and subtraction with reasoning

For Nursery and reception progress see link LTP overview for maths

Calculation policy and vocabulary progression is used to support teaching and progress

NUMBER BONDS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
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				
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 included subtraction? **Missing numbers** 9 + $\boxed{}$ = 10 10 - $\boxed{}$ = 9 What number goes in the missing box?	**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** 91 + $\boxed{}$ = 100 100 - $\boxed{}$ = 89 What number goes in the missing box?				

MENTAL CALCULATION					
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
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 on other given numbers?” **What do you notice?** 11 – 1 = 10 11 – 10 = 1	**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. **Hard and easy questions** Which questions are easy / hard? 23 + 10 = 93 + 10 = 54 + 9 =	**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** Which questions are easy / hard? 323 + 10 = 393 + 10 = 454 - 100 =	**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** Which questions are easy / hard? 13323 - 70 = 12893 + 300 = 19354 - 500 =	**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** Which questions are easy / hard? 213323 - 70 = 512893 + 300 = 819354 - 500 =	**True or false?** Are these number sentences true or false?6.32 + $\square$ = 8 $\square$ = 1.68 Give your reasons. **Hard and easy questions** Which questions are easy / hard? 213323 - 70 =

Can you make up some other number sentences like this involving 3 different numbers?	54 + 1 = Explain why you think the hard questions are hard? **Other possibilities** $\square + \square + \square = 14$ What single digit numbers could go in the boxes? How many different ways can you do this?	954 - 120 = Explain why you think the hard questions are hard?	19954 + 100 = Explain why you think the hard questions are hard?	319954 + 100 = Explain why you think the hard questions are hard?	512893 + 37 = 8193.54 - 5.9 = Explain why you think the hard questions are hard?
read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods)	show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot				use their knowledge of the order of operations to carry out calculations involving the four operations

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 ○ .9 **What else do you know?** If you know this: 86.7 + 13.3 = 100 what other facts do you know?

WRITTEN METHODS					
read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation)		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)	
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 + $\square$ = 19 20 - $\square$ = 3	**Convince me** What digits could go in the boxes? 7 $\square$ - 2 $\square$ = 46 Try to find all of the possible answers. How do you know you have got them all? Convince me	**Convince me** $\square\square$ + $\square\square$ + $\square\square$ 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	**Convince me** $\square$ - 666 = 8 $\square$ What is the largest possible number that will go in the rectangular box? What is the smallest? Convince me	**Convince me** $\square$ + 1475 = 6 $\square$ 24 What numbers go in the boxes? What different answers are there? Convince me	**Convince me** Three four digit numbers total 12435. What could they be? Convince me

INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS					
	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.
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?	**Making an estimate** 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	**Making an estimate** 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	**Making an estimate** 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.	**Making an estimate** 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.	**Making an estimate** 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

PROBLEM SOLVING					
solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ - 9	solve problems with addition and subtraction: * using concrete objects and pictorial representations, including those involving numbers, quantities and measures * applying their increasing knowledge of mental and written methods	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
	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