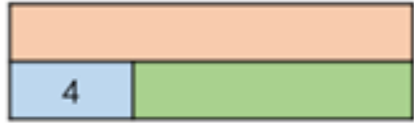
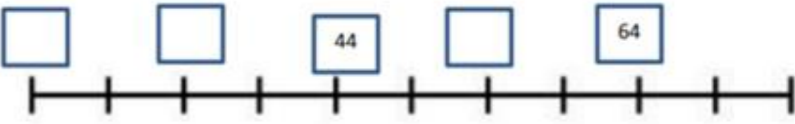


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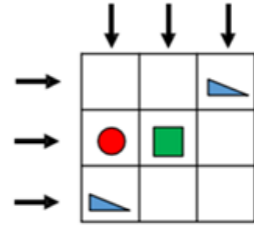

Year 2 – Addition and Subtraction (Approximately 5 weeks split – 3 weeks in Autumn and 2 weeks in Spring)

Objectives from Progression Document	<p>recall and use addition and subtraction facts to 20</p> <p>use + and - facts up to 100 related to known addition and subtraction facts to 20</p> <p>understand that addition of two numbers can be done in any order (commutative)</p> <p>understand that subtraction of one number from another cannot be done in any order</p> <p>recognise the inverse relationship between addition and subtraction</p> <p>add and subtract a two-digit number and ones using concrete objects, pictorial representations*, and mentally</p> <p>add and subtract a two-digit number and tens using concrete objects, pictorial representations*, and mentally</p> <p>add and subtract two two-digit numbers using concrete objects, pictorial representations*, and mentally</p> <p>add three one-digit numbers</p> <p>use the inverse relationship between addition and subtraction to check calculations</p> <p>show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot</p> <p>solve problems with addition and subtraction involving numbers</p> <p>solve problems with addition and subtraction involving quantities</p> <p>solve problems with addition and subtraction involving measures</p> <p>derive + and – facts up to 100 related to known addition and subtraction facts to 20</p>
Previous Learning	<p>read, write and interpret mathematical statements involving addition (+) and equals (=) signs</p> <p>read, write and interpret mathematical statements involving subtraction (-) and equals (=) signs</p> <p>represent and use number bonds within 20</p> <p>represent and use subtraction facts related to number bonds within 20</p> <p>add and subtract one-digit and two-digit numbers to 20, including zero</p> <p>solve one-step problems that involve addition and subtraction</p>
Vocabulary	<p>(recap year one vocabulary); inverse, bar model</p>
Key fact(s)	<p>To know the importance of the tens digit</p> <p>To know that addition of two numbers can be done in any order (commutative)</p> <p>To know that subtraction of one number from another cannot be done in any order</p> <p>To know that addition and subtraction are the opposite of one another (inverse)</p>
Number facts for fluency	<p>Fluency Bee Stage 2:</p> <p>Add and Subtract 2 (including counting in 2s)</p>
DfE Ready to Progress Guidance Pages https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897806/Maths_guidance_KS_1_and_2.pdf	<p>2AS-1 Add and subtract across 10 pages 18 -20</p> <p>2AS-2 Solve comparative addition and difference problems pages 20 - 22</p> <p>2AS-3 Add and subtract within 100 – part 1 pages 23 - 26</p> <p>2AS-4 Add and subtract within 100 – part 2 pages 27 – 29</p> <p>2NF-1 Fluently add and subtract within 10 pages 16 - 17</p>
NCETM Ready to Progress Exemplification https://www.ncetm.org.uk/classroom-resources/exemplification-of-ready-to-progress-criteria/	<p>2AS – 1 Addition and Subtraction across 10</p> <p>2AS – 2 Solve comparative addition and difference problems</p> <p>2AS-3 Add and subtract within 100 – part 1</p> <p>2AS-4 Add and subtract within 100 – part 2</p> <p>2NF-1 Fluently add and subtract within 10 pages 16 - 17</p>
Problem Solving and Reasoning Skills Objectives	<p>respond to ‘What if...?’ questions, making predictions based on mathematical knowledge</p> <p>identify the key information in a two-step puzzle or word problem, where the two steps are shown in the question</p>
Pre-assessment:	<p>Year one addition and subtraction – addition and subtraction within 10 and within 20</p>

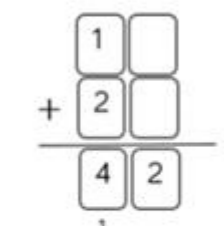

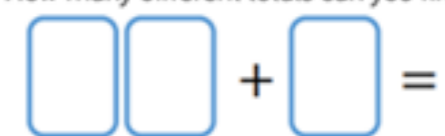
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Sequence of Learning						
White Rose Small Steps	Learning Intention	Key Questions	Sentence Stems	Comments	Problem-solving links	Extension and Greater Depth Opportunities
Bonds to 10 (2NF 1)	To practise using known number bond facts	How many ___ have you got? How many more do you need to make 10? What is the bond to 10 for ___? What number are you starting with? What do you need to add to make 10? If $4 + 5 = 9$, what is the missing number in $4 + \underline{\quad} = 10$? How do you know?	If I have ___ counters, I need to add ___ more counters to make 10. I need to add ___ to ___ to make 10.	Children may not use efficient strategies when working out an answer to a calculation. For example, when calculating $3 + 7$, they may start at 3 and count on 7 rather than start at 7 and count on 3		Using these digits, can you complete each number sentence? 19 9 10 ___ + ___ = ___ ___ + ___ = ___ ___ - ___ = ___ ___ - ___ = ___ Both missing numbers are less than 10 $7 + \square < 7 + \square$ How many different possible answers can you find? Here is an incomplete bar model. The total is greater than 10 but less than 20 What could the missing numbers be? How many different combinations can you find?  Fill in the missing numbers in the number line.  What other numbers can you show?
Fact families – addition and subtraction bonds to 20 (2NF 1)	To be able to work out the fact families for all addition bonds to 20	How many ___ have you got? How many more ___ do you need to make ___? What is the bond to ___ for ___? What number are you starting with? What do you need to add to make ___? If $4 + 5 = 9$, what is the missing number in $14 + \underline{\quad} = 19$? How do you know?	If I have ___ counters, I need to add ___ more counters to make ___. I need to add ___ to ___ to make ___.	Children looked at fact families in Year 1 and these are reintroduced here to write the addition and subtraction statements for number bonds. This is a good opportunity to remind children of the commutative property of addition. Children may assume that as addition is commutative, then subtraction must also be commutative. Some children may think that because $4 + 6 = 10$, they can add 10 to each number to give $14 + 16 = 20$	Strike it Out (maths.org) Strike it Out. Game practising number bonds to 20.	
Related facts (2AS 3)	To be able to use known number facts to work out other facts	If 2 ones plus 3 ones is equal to 5 ones, what is 2 tens plus 3 tens? What is the same about the number sentences? What is different? If $3 + 5 = 8$, what is $30 + 50$? How do you know? If $6 - 2 = 4$, what is $60 - 20$? How do you know? Show each number sentence using base 10. What is the same? What is different?	___ ones + ___ ones = ___ ones, so ___ tens + ___ tens = ___ tens. This means that ___ + ___ = ___. ___ ones - ___ ones = ___ ones, so ___ tens - ___ tens = ___ tens. This means that ___ - ___ = ___.	If children know that $2 + 5 = 7$, then they should be able to use this knowledge to state that $20 + 50 = 70$. Unitising tens and ones within a calculation can support children's understanding and help to avoid common misconceptions. Children may think that if $8 - 3 = 5$, then $80 - 30 = 5$ because the zeros cancel each other out. Some children may think that, for example, $20 + 30 = 500$ because $2 + 3 = 5$ and there are two zeros.		
Bonds to 100 (tens)	To apply known number bonds for numbers up to 10 to work out bonds for multiples of 10 up to 100	How many tens are there in 100? How many tens are there? How many more do you need to make 100? What is the bond to 100 for ___? What number are you starting with? What do you need to add to make 100? If $4 + 6 = 10$, what is the missing number in $40 + \underline{\quad} = 100$? How do you know?	If ___ ones + ___ ones = 10, then ___ tens + ___ tens = 100. If I have ___ tens, I need to add ___ more tens to make 100. I need to add ___ to ___ to make 100.	The focus is on multiples of 10 that have bonds to 100. If children found any particular bonds to 10 challenging, they are likely to carry this through to this step. A Rekenrek and base 10 are useful concrete resources to support this learning. While base 10 supports the link between related facts, the Rekenrek ensures that children keep the 100 visible at all times. A hundred square can also be used.		
Add and subtract 1s (2AS 3)	To be able to add and subtract 1s from any number within 100	How many ones are there in ___? How many ones do you need to add/subtract?	___ has ___ tens and ___ ones. ___ ones + ___ ones = ___ ones, so ___ + ___ = ___.	Children may add to the wrong digit, for example $23 + 1 = 33$. When a calculation is written with the smallest number first, for example $2 + 35$, children may try to count on 35 rather than use the	The Add and Take-away Path (maths.org) The Add and Take-Away Path. Adding and subtracting practice	


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		What is ___ ones + ___ ones? What is ___ + ___? What happens to the tens? What happens to the ones?	To subtract ___ ones, I need to subtract 1 ___ times.	commutative property of addition to support them.	with predicting and understanding inverse operations.	 <p>Squares are worth 10 Triangles are worth 20 Circles are worth 30</p> <p>Can you complete the grid above so that all horizontal and vertical lines equal 60?</p> <p>Can children create another pattern on an empty grid where each line equals 60? How many possible ways are there to solve this?</p>
Add by making 10 (2AS 1)	To add two 1-digit numbers by finding bonds to 10 and adding on	What numbers do you need to add together? What is the bond to 10 for ___? What do you need to add to ___ to ___ make ___? What can you partition ___ into? How many more do you need to add to 10? What is ___ plus ___? Why does partitioning ___ into ___ and ___ help with this question?	___ can be partitioned into ___ and ___. ___ + ___ = 10 10 + ___ = ___ So ___ + ___ = ___.	If children are not confident in recalling their number bonds to 10, this will cause difficulty in this small step. Children may not partition the number they are adding in a way that simplifies the calculation. Some children may identify the jump to 10, but then still rely on their fingers to count beyond 10.		
Add three 1-digit numbers (2AS 1)	To use number bonds to 10 to help add three 1-digit numbers	What is ___ ones + ___ ones? If you add ___ more ones, what do you get? What is ___ + ___ + ___? Does it matter what order you add the numbers in? Can you see any number bonds in the calculation? What is the most efficient way to complete the calculation?	___ ones + ___ ones = ___ ones So ___ ones + ___ ones + ___ ones = ___ ones. ___ and ___ are a bond to ___. 10 + ___ = ___ So ___ + ___ + ___ = ___.	Children recognise that to add three numbers, they just need to add two of them and then add the third to the answer. Children may add two pairs of numbers and then add the answers. For example, when working out 4 + 3 + 6, they might add 4 and 3 to give 7, add 3 and 6 to give 9 and then add the 9 to the 7. Children may make numerical errors when crossing 10.	What's in a Name? (maths.org) What's in a name? a problem to practise mental maths purposefully.	
Add to the next 10	To use number bonds knowledge to add to the next ten	What numbers do you need to add together? How many tens are there in ___? What is the multiple of 10 after ___? How many ones are there in ___? What is the bond to 10 for ___? How many more do you need to add to get to ___? What is ___ plus ___?	___ has ___ tens and ___ ones. The next 10 is ___. The bond to 10 for ___ is ___. I need to add ___ to ___ to get to the next 10.	Useful concrete resources to support this learning are base 10 and Rekenreks, as children can physically see the 10 they are making. It is important they do not rely on counting the individual ones and so move towards a mental strategy. Calculations presented in a different way can feel more difficult.		<p>Here are Class 2's crayons.</p>  <p>They are given a new box of 10 each day for a week.</p> <p>How many crayons do they have at the end of the week?</p>
Add across a 10	To add a 1 digit and a 2 digit number, crossing 10	What numbers do you need to add together? How many tens are there in ___? What do you need to add to get to the next 10? What can you partition ___ into? How many more do you need to add? What is ___ plus ___?	The multiple of 10 after ___ is ___. I need to add ___ to get to the next 10. ___ + ___ = ___ I need to add ___ more. So ___ + ___ = ___.	Children are not required to set their calculations up using the formal written method, but they should be encouraged to set concrete resources out in a methodical way. If children are not confident in their number bonds to 10, it can make this step more challenging. Children may think calculations such as 3 + 19 are harder than 19 + 3, but should be encouraged to recognise that these are the same.		<p>What digits could go in the boxes?</p> $\square 2 + \square 5 = 87$ <p>34 + \square = 40</p> <p>\square + 3 = 30</p> <p>40 = 47 - \square</p> <p>50 = \square - 6</p>
Subtract across 10	To subtract from 2-digit numbers less than 20, crossing 10	How many do you start with? How many do you need to take away? What can you partition ___ into? How many do you need to subtract to get 10?	I need to subtract ___ to get to 10. ___ can partition ___ into ___ and ___. I need to subtract ___ more. ___ less than ___ is ___.	Children will need to partition the 1-digit number in order to get to 10 and then subtract whatever is remaining. Number lines for representing calculations and part-whole models for partitioning are useful throughout. Children may find the difference between the ones rather than correctly performing the	Arranging Additions and Sorting Subtractions (maths.org) Subtraction slip. Video for discussion of	

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		How many more do you need to subtract? What is ___ less than ___?		subtraction, for example $15 - 7 = 12$ because $7 - 5 = 2$. If children incorrectly partition a number, this will lead to an incorrect answer.	subtraction of error and best method.	Find all the possible pairs of numbers that can complete the addition.
Subtract from a 10	To subtract a 1-digit number from any multiple of 10 within 100	How many do you start with? How many do you need to take away? What is the bond to 10 for ___? What is ___ less than 10? So what is less than ___? If you know that $4 + 6 = 10$, what is $50 - 6$? What do you notice about the tens? What do you notice about the ones?	When subtracting, the answer will be ___ than the number I start with. ___ + ___ = 10, so $10 - \underline{\quad} = \underline{\quad}$. If $10 - \underline{\quad} = \underline{\quad}$, then ___ - ___ = ___.	Children subtract a 1-digit number from any multiple of 10 within 100. Their knowledge of fact families for number bonds is particularly helpful here. While children might initially count back using the chosen representations as support, it is essential that they do not rely too heavily on counting the individual ones, as they need to move towards a mental strategy. Children may not reduce the number of tens by 1, instead just using bonds to 10, for example $50 - 4 = 56$		 <p>How do you know you have found all the pairs?</p> <p>What is the same about all the pairs of numbers?</p>
Subtract a 1-digit number from a 2-digit number – (across a ten) (2AS 3)	To be able to subtract a 1-digit number from any 2-digit number with exchanging	How many do you start with? How many do you need to take away? What is the multiple of 10 before ___? What can you partition ___ into? How many do you need to subtract to get to the previous 10? How many more do you need to subtract? So what is ___ less than ___?	The previous multiple of 10 is ___. ___ = ___ + ___, so ___ - ___ = ___ - ___ - ___. I need to subtract ___ and then subtract another ___.	Children are not required to set out their calculations using the formal written method. Children may find the difference between the ones digits, for example $34 - 7 = 33$ because $7 - 4 = 3$. When counting back, children may get to, for example, 50 and then go to 59, rather than recognising that they have crossed a 10 and should be at 49.		<p>Here are three digit cards.</p>  <p>Place the digit cards in the number sentence.</p> <p>How many different totals can you find?</p>  <p>What is the smallest total?</p> <p>What is the largest total?</p>
10 more, 10 less (2AS 3)	To be able to work out 10 more and 10 less than any number within 100	What number are you starting with? When you count on 10, what do you get? When you count back 10, what do you get? What is 10 more/less than ___? What do you notice about the number of tens? What do you notice about the number of ones? What do you notice about the positions of the numbers on the hundred square?	___ has ___ tens and ___ ones. 10 more than ___ is ___. 10 less than ___ is ___.	Children may add or subtract 1 from the ones digit rather than from the tens digit. Children may jump straight to the next/previous multiple of 10 rather than finding 10 more/less than the given number. Children need to pay close attention to the digits in the number before and after finding 10 more/less to recognise that the tens digit increases/decreases by 1, while the ones digit remains unchanged.		
Add and subtract 10s (2AS 3)	To be able to add and subtract multiples of 10 to numbers within 100	What number are you starting with? Count on/back 10. What do you get? Count on/back another 10. What do you get? 30 has ___ tens, so I need to add/subtract ___ 10 times. What is ___ more/less than ___? What do you notice about the number of tens? What do you notice about the number of ones?	___ has ___ tens. To add/subtract ___, I need to add/subtract ___ 10 times.	Children may add or subtract from the ones digit rather than from the tens digit. Children may jump straight to the next/previous multiple of 10 and then keep counting in 10s.	Arranging Additions and Sorting Subtractions (maths.org) Arranging additions and sorting subtractions. Discussing and explaining which calculations are easiest/hardest.	Can you create a calculation where there will be an exchange in the ones and your answer will have two ones and be less than 100?

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		What do you notice about the positions of the numbers on the hundred square?				
Add two 2-digit numbers – not across a ten (2AS 4)	To be able to add two 2-digit numbers in different representations, without exchanging	What numbers are you adding together? How many ones are there in each number? How many ones are there altogether? How many tens are there in each number? How many tens are there altogether?	___ ones + ___ ones = ___ ones. ___ tens + ___ tens = ___ tens. There are ___ ones altogether. There are ___ tens altogether. ___ tens and ___ ones is ___.	The calculations in this step do not require children to make an exchange. While it will be tempting for children to consider the tens first, as they are used to working from left to right, encourage them to first consider how many ones they have altogether before looking at the tens. If children do not set out their concrete resources in an organised way, they may make numerical errors. Children may add the tens first, then the ones. While this will work for these questions, it will hold them back in later steps.		True or False? When you subtract 2 even numbers, the answer is always even. Explain your answer.
Add two 2-digit numbers – across a ten (2AS 4)	To be able to add two 2-digit numbers by adding ones and tens, with exchange	How many ones are there in each number? How many ones are there altogether? Can you make an exchange? Why? How many tens are there in each number? How many tens are there altogether? Did you include the ten from your exchange?	___ has ___ tens and ___ ones. ___ ones + ___ ones = ___ ones. ___ ones = ___ ten + ___ ones. There are ___ ones, so I do/do not need to make an exchange.	Children should first consider how many ones they have before looking at the tens. They could also be encouraged to think about why they need to do it in this order. Children do not need to set out their calculations using the column method, but should be encouraged to organise their manipulatives in a structured way. Children may say, for example, $25 + 38 = 513$ because 5 ones + 8 ones = 13 ones and 2 tens + 3 tens = 5 tens. Children may forget to add the extra ten that resulted from an exchange.		Find the missing numbers. 
Subtract two 2-digit numbers (not across a ten) (2AS 4)	To be able to subtract a 2-digit number from a 2-digit number in different representations, without exchanging	What number are you subtracting from? What number are you subtracting? How many ones do you need to subtract? How many ones are left? How many tens do you need to subtract? How many tens are left? What is the difference between ___ and ___?	___ ones – ___ ones = ___ ones. ___ tens – ___ tens = ___ tens. The difference between ___ and ___ is ___. ___ minus ___ is equal to ___.	When adding, children used base 10 to make both numbers. Doing that here may cause confusion. Instead, they need to make the greater of the two numbers and “take away” the smaller one. Children may start by considering the tens first, which can cause problems with later learning.		Is this the only possible solution? Explain your answer. Make the numbers using Base 10 to help you find your answer.
Subtract two 2-digit numbers (across a ten) (2AS 4)	To be able to subtract a 2-digit number from a 2-digit number by subtracting ones and tens, with exchange	What number are you subtracting from? How many ones do you need to subtract? What do you do if there are not enough ones? What can you exchange 1 ten for? How many tens do you need to subtract? How many tens are left? What is the difference between ___ and ___?	1 ten is equal to ___ ones. I need to exchange ___ for ___. I know I need to make an exchange because ... The difference between ___ and ___ is ___.	Children look at calculations where they must exchange 1 ten for 10 ones in order to complete the subtraction. Children may simply find the difference between the tens digits and the ones digits in order to avoid making an exchange, for example $81 - 25 = 64$ because $8 - 2 = 6$ and $5 - 1 = 4$. Children do not need to set out their calculations using the column method, but should be encouraged to organise their manipulatives in a structured way.		True or false? “When you add 3 odd numbers it will make 20.”
Mixed addition and subtraction	To use a bar model to help answer mixed addition and subtraction word problems	Is the question an addition or a subtraction? How do you know? Do you need to make both numbers using base 10? Why/why not?	I know this is an addition/subtraction because... I know I need to make an exchange because... ___ plus ___ is equal to ___.	If children make both numbers using base 10 to perform a subtraction, this can lead to confusion. When performing a subtraction, children may just find the difference between digits in each column, rather than make an exchange.	Number Round Up (maths.org) Number Round Up. Context in which addition and subtraction can be practised.	Take 3 consecutive one-digit numbers, e.g. 4, 5 and 6. Add them together. What do you notice? Choose different groups of 3 consecutive one-digit numbers and see if there is a pattern.

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		What does the number ____ represent in the calculation? Do you need to make an exchange? How do you know?	____ subtract ____ is equal to ____.	Before they begin a question, encourage children to consider whether it will require an exchange, and ask them to explain their decision.	
Compare number sentences (2NF 1)	To compare number sentences by looking for what is the same and what is different	What do the symbols >, < and = mean? Do you need to work out the answer to each calculation? Why/why not? When you add a greater number, is the answer greater or smaller? When you subtract a greater number, is the answer greater or smaller?	____ is greater/less than ____. ____ is greater than ____, so ____ + ____ is greater than ____ + ____. ____ is less than ____, so ____ - ____ is greater than ____ - ____.	Children should already be familiar with the inequality symbols and in this small step they use them to compare number sentences. Encourage children to use correct mathematical language to say their answer in words. Children may need reminding of the meaning of the inequality symbols. When comparing calculations, children may automatically find the value of each number sentence rather than considering the numbers that they are made up of.	
Missing number problems	To solve problems that involve missing numbers	What can you partition ____ into? How does that help you to work out the missing number? If one number increases by ____ ones, what must happen to the other number if the answer is the same? Do you need to work out the answer to each calculation? How can you check your answer? What do you notice about the numbers?	____ can be partitioned into ____ and ____. ____ + ____ = ____ + ____ + ____ ____ is ____ more than ____, so the missing number must be ____.	Correct mathematical language can support children's understanding. When finding the missing number in $10 + 6 = 13 + \underline{\quad}$, children may think that because 13 is 3 more than 10, then the missing number must be 3 more than 6. Children may try to complete a series of calculations to find the missing number, rather than think about the connections between the numbers in the question.	Eggs in Baskets (maths.org) Eggs in baskets. Problem needing complex thinking although small numbers are involved.
Post-assessment	WRH end of block addition and subtraction assessment – snip as feel appropriate Previous addition and subtraction SATs questions – snip as feel appropriate				