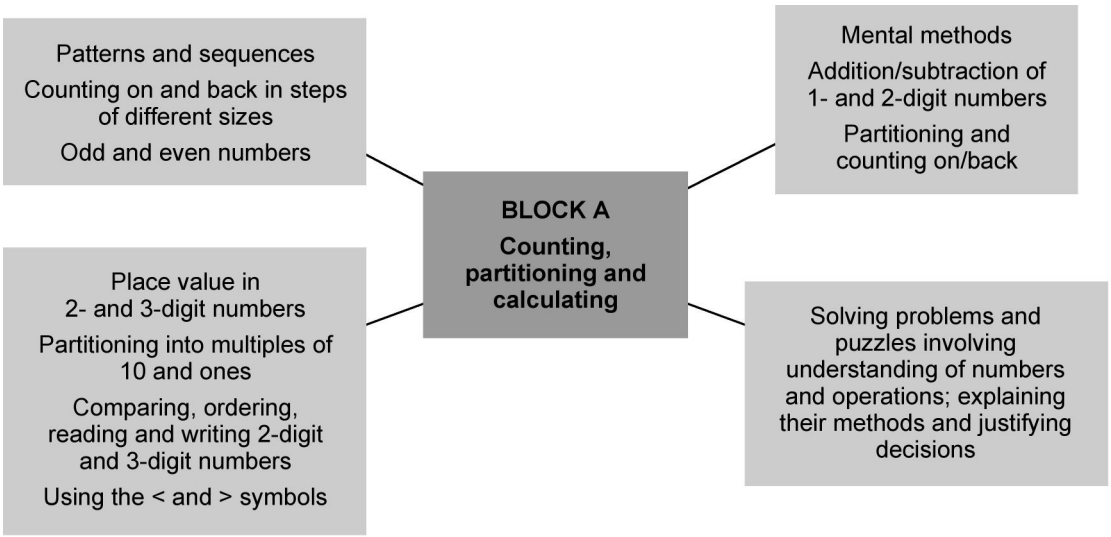
Year 2: Block A — Three 2-week units

Counting, partitioning and calculating



Objectives End-of-year expectations (key objectives) are highlighted	Units 1	 2	 3
• Present solutions to puzzles and problems in an organised way; explain decisions, methods and results in pictorial, spoken or written form, using mathematical language and number sentences	✓	✓	✓
• Read and write two-digit and three-digit numbers in figures and words; describe and extend number sequences and recognise odd and even numbers	✓	✓	✓
• Count up to 100 objects by grouping them and counting in tens, fives or twos; explain what each digit in a two-digit number represents, including numbers where 0 is a place holder; partition two-digit numbers in different ways, including into multiples of 10 and 1	✓	✓	✓
• Order two-digit numbers and position them on a number line; use the greater than (>) and less than (<) signs	✓		✓
• Estimate a number of objects; round two-digit numbers to the nearest 10	✓		✓
• Add or subtract mentally a one-digit number or a multiple of 10 to or from any two-digit number; use practical and informal written methods to add and subtract two-digit numbers	✓	✓	✓
• Understand that subtraction is the inverse of addition and vice versa; use this to derive and record related addition and subtraction number sentences	✓		✓
• Use the symbols +, –, ×, ÷ and = to record and interpret number sentences involving all four operations; calculate the value of an unknown in a number sentence (e.g. ☐ ÷ 2 = 6, 30 – ☐ = 24)		✓	✓

Speaking and listening objectives for the block

Objectives	Units		
	1	2	3
• Speak with clarity and intonation when reading and reciting texts	✓	✓	
• Respond to presentations by describing characters, repeating some highlights and commenting constructively			✓

Opportunities to apply mathematics in science

Activities		Units		
		1	2	3
2a	Health and growth: Count how many people like different foods.	✓		
2b	Plants and animals in the local environment: When observing animals, estimate numbers (for example, the number of woodlice under a stone). Use a tally chart to record the number of birds visiting a bird table.		✓	
2d	Grouping and changing materials: Measure the time taken for ice to melt in different parts of classroom. Order the results.			✓

Key aspects of learning: focus for the block

Enquiry	**Problem solving**	**Reasoning**	Creative thinking
Information processing	Evaluation	Self-awareness	Managing feeling
Social skills	**Communication**	Motivation	Empathy

Vocabulary

zero, ten, twenty, …, one hundred, two hundred, …, one thousand, count in ones, twos, threes, fours, fives and so on, odd, even, pattern, sequence, continue, partition numbers

compare, order, larger, greater than, smaller, less than, between, halfway between, difference between, round, nearest 10, tens boundary, roughly, about the same as

calculate, mental calculation, right, correct, wrong, number sentence, sign, operation, symbol, penny/pence (p), pound (£)

Building on previous learning

Check that children can already:

- talk about how they solve problems, using the vocabulary of addition and subtraction and number sentences to describe and record their work
- count reliably at least 20 objects; estimate a number of objects that can be checked by counting
- read and write numerals from 0 to 20, and order these numbers on a number line
- say the number that is 1 more or less than any given number, and 10 more or less than a multiple of 10
- understand that addition can be done in any order and relate addition to counting
- understand subtraction as ‘take away’ and counting back, and find a difference by counting up
- recognise the value of coins

Unit 2A1 2 weeks

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Present solutions to puzzles and problems in an organised way; explain decisions, methods and results in pictorial, spoken or written form, using mathematical language and number sentences *I can explain to others how I solved a problem*	How did you solve the problem? How did you decide which information to use? How did you know which calculations to do? Explain how you did your calculation. Could you draw something or use a number line to help us understand what you did?
• Read and write two-digit and three-digit numbers in figures and words; describe and extend number sequences and recognise odd and even numbers *I can read and write two-digit numbers* *I know which numbers are odd and which are even*	[Show number cards for 17 and 71.] Which of these numbers is seventeen? How do you know? What does the other one say? Are these numbers even or odd? Count in fives from 0 up to 30. Which of those numbers are odd and which are even? How do you know?
• Count up to 100 objects by grouping them and counting in tens, fives or twos; explain what each digit in a two-digit number represents, including numbers where 0 is a place holder; partition two-digit numbers in different ways, including into multiples of 10 and 1 *I can count objects by putting them into groups* *I can partition numbers*	Tell me how many counters are in this pile. Can you find a quicker way than counting in ones? There are more than 20 counters here. Find out how many there are. Is there a better way than counting in twos? Why is this better than counting in ones or twos? There are 4 tens in 40. How many tens are there in 47? What makes 40 and 47 different?
• Order two-digit numbers and position them on a number line; use the greater than (>) and less than (<) signs *I can write numbers in order and position them on a number line* *I can use the greater than and less than symbols to show that one number is larger or smaller than another*	Look at these numbers: 24 42 46 64 43 34 Which of the numbers lie between 30 and 40 on the number line? Which of the numbers could you use to make this correct? ☐ < 24 Which of the numbers could you use to make this correct? ☐ > 43
• Estimate a number of objects; round two-digit numbers to the nearest 10 *I can round numbers to the nearest 10*	Look at the counters in the pile/pencils in the pot. Estimate how many counters/pencils there are. How did you make your estimate? What information did you use? What helped you to decide? There are 26 counters in the pile/pencils in the pot. What is that rounded to the nearest 10?
• Add or subtract mentally a one-digit number or a multiple of 10 to or from any two-digit number; use practical and informal written methods to add and subtract two-digit numbers *I can add and subtract some numbers in my head*	What is 37 + 8? What number facts might you use to help you work this out? How many do you need to add to 37 to get to the next multiple of 10? How might you partition 8 to help you? How could you show that on a number line? What is 37 – 8? Which number facts will help this time? How much do you need to subtract to go down to the multiple of 10 before 37? How much more do you need to subtract?

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Understand that subtraction is the inverse of addition and vice versa; use this to derive and record related addition and subtraction number sentences *I know that addition and subtraction 'undo' each other* *I can write three other related number sentences for 6 + 3 = 9*	Look at this number sentence: 17 – 9 = 8 Write three more number sentences using these numbers. How do you know, without calculating, that they are correct? I think of a number and add 5. The answer is 12. What is my number?
• Speak with clarity and intonation when reading and reciting texts *I can speak clearly to the class or group when I show and explain how I solved a problem or my method for a calculation*	Explain how you solved the problem. Does everyone understand how the problem was solved? Is there another way to explain? Would it help to use a diagram or use some practical equipment to show your solution?

Learning overview

Children **count on and back from any two-digit number** in steps of 1, 2, 5 and 10. They notice patterns in the count, including those involving odd and even numbers. They find the number that is 1 or 10 more or less than any given number.

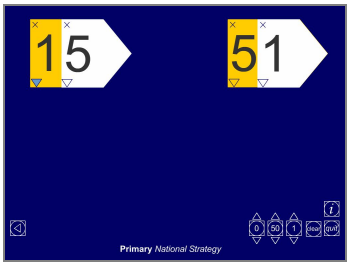
Children count a large set of objects efficiently, for example grouping them into twos, fives or tens. They understand that it is more reliable, and can be quicker, to group the objects rather than count them in ones. They **solve problems** involving counting such as:

How many 2p coins are needed to make 12p?

Count on in tens from the number 27. Will the number 85 be in the count? How do you know?

Children **explain their reasoning** and use equipment or images such as a 100-square to support their explanations.

Children **read and write two-digit numbers**, recognising the difference between, for example, 'fifty' and 'fifteen'. They know what each digit in a two-digit number represents. When shown numbers using the ITP 'Place value' they explain why, for example, the 5 in 25 has a different value from the 5 in 50. They discuss why it is necessary to write 0 in the units place for the number 40.



Children **order numbers** by discussing the value of their digits and by considering their relative positions on a number line. They know that when they order two-digit numbers the tens digit is more significant than the units digit. They use this to explain how to identify the larger or smaller of two numbers. They compare the size of two numbers and use the < and > symbols to record their comparison.

Children **partition two-digit numbers** and use this to solve problems. For example, they show that 53 = 50 + 3 or 40 + 13 or 30 + 23, and so on. They establish, for example, how many different numbers can be made with the place value cards 20, 40, 3 and 5. They record their solutions in an organised way using pictures or symbols. Children know which two-digit numbers are multiples of 10. They recognise which two multiples of 10 any two-digit number lies between. They use this to

place two-digit numbers on a number line and to round numbers to the nearest 10 by considering which of the two multiples of 10 is closer.

Children **add or subtract a one-digit number to or from any two-digit number** by counting in ones, taking particular care when counting over a tens boundary. They begin to use their knowledge of number facts to 10 and partitioning to add and subtract numbers crossing the tens boundary, for example:

48 + 7 = 48 + 2 + 5 = 55

34 – 6 = 34 – 4 – 2 = 28

They demonstrate their calculations on a number line.

They explore what happens when, for example, you add 7 to any number and then subtract 7. They understand that addition and subtraction are **inverse operations**, i.e. that subtraction 'undoes' an addition and vice versa. They record related addition and subtraction sentences such as:

48 + 7 = 55 55 – 7 = 48

62 – 6 = 56 56 + 6 = 62

Children **solve word problems** using notes, number lines and number grids to support and explain methods. For example, given that a purse contains 54p, they explain how much money is left inside when 10p is taken out. They **solve number puzzles** such as:

Put + or – in each circle to make these calculations correct:

27 ○ 8 = 35 62 ○ 55 = 7 38 ○ 2 ○ 5 = 41

They explain their methods and results using mathematical language, jottings and symbols.

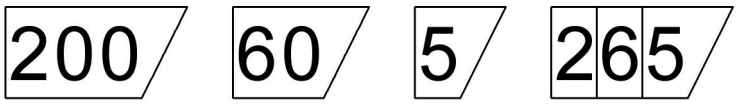
Unit 2A2 2 weeks

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Present solutions to puzzles and problems in an organised way; explain decisions, methods and results in pictorial, spoken or written form, using mathematical language and number sentences *I can explain how I solved a problem and say why I did it that way*	What information did you use to solve the problem? How did you decide which calculations to do? Could you have solved it in a different way? How is your method different from Judi's method?
• Read and write two-digit and three-digit numbers in figures and words; describe and extend number sequences and recognise odd and even numbers *I can read and write numbers up to 1000 in figures and in words* *I know which numbers are odd and which are even*	Give the children three digit cards, including 0, for example: 3 6 0 What numbers can you make using two or three of these digits? Write down each number you make. Read those numbers to me. Can you write the largest of the numbers in words? Which of your numbers are odd and which are even? How do you know?
• Count up to 100 objects by grouping them and counting in tens, fives or twos; explain what each digit in a two-digit number represents, including numbers where 0 is a place holder; partition two-digit numbers in different ways, including into multiples of 10 and 1 *I can explain what each digit in a two-digit number stands for* *I can partition numbers in different ways*	[Show number cards for 19 and 91.] Which of these numbers is nineteen? How do you know? What does the other one say? How are they the same/different? How many tens are there in 60? Use this to partition the number 67. Show me two other ways you might partition this number.
• Add or subtract mentally a one-digit number or a multiple of 10 to or from any two-digit number; use practical and informal written methods to add and subtract two-digit numbers *I can add and subtract some numbers in my head* *I can add and subtract bigger numbers using practical equipment or by writing notes to help me*	What is 48 + 5? How did you work it out? What is 48 + 50? How did you work this out? How do you know that the answer is **not** 53? Could you write something or use apparatus to help you explain?
• Use the symbols +, –, ×, ÷ and = to record and interpret number sentences involving all four operations; calculate the value of an unknown in a number sentence (e.g. □ ÷ 2 = 6, 30 – □ = 24) *I know how to write number sentences using the symbols +, –, ×, ÷ and =* *I can explain what different number sentences mean*	What number goes in the box to make this calculation correct? □ ÷ 2 = 7 How do you know? Can you make three different number sentences using 16, 7 and 23 with = and any of the four operation symbols? Can you change the three numbers to make this into a different problem for someone else to solve? How will you know if their answer is correct?

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Speak with clarity and intonation when reading and reciting *I can speak clearly to the class or group when showing and explaining how I solved a problem or my method for a calculation*	Can you explain your method clearly so that someone else in the class could use it to solve another problem like this?

Learning overview

Children build on their knowledge of **reading and writing two- and three-digit numbers**. They know that 300, for example, has a zero in the tens and units columns. They understand that when they write two hundred and sixty-five the zeros are replaced: in the tens column by 6, to give sixty; and in the units column by 5, giving 265.



They use practical equipment such as 100-squares and arrow cards to develop and support their understanding. For example they select arrow cards for the numbers 10, 50, 90 and explain why there is only one card for each of these two-digit numbers.

They **partition two-digit numbers in different ways**, for example:

25 = 20 + 5 25 = 10 + 10 + 5 25 = 10 + 9 + 6 25 = 19 + 6

They find missing numbers in calculations such as 37 = 30 + ☐ + 2.

Based on their experience of counting objects, children **estimate** the number of objects in a set. For example, having counted how many counters fill a cup, they estimate the number of counters in a cup that is about half full. They discuss and compare estimates and explain how the estimate was reached.

Children **count on from and back to any number** in ones, including across tens and hundreds boundaries. They count in tens across hundreds boundaries, using equipment such as base-ten apparatus, coins or a calculator to secure their understanding. Children use their understanding of partitioning and place value to explain the effect on the digits of adding or subtracting 10 to or from a number. They explain that we can add or subtract 9 to or from a two-digit number by adding or subtracting 10 then adjusting. They illustrate why this works, for example using a 100-square or number line to demonstrate their understanding.

Children understand and use the term **difference** and find or describe the difference between two numbers practically. They count how many more cubes there are, say, in a tower of 15 cubes than a tower of 11 cubes to find the difference between 15 and 11. They find how much they need to count on from 29 to reach 34 to find the difference between 29 and 34. Children learn that finding the difference involves comparing two numbers and either counting on from the smaller number or subtracting the smaller number from the larger number. They demonstrate this on a number line. They record these calculations as **addition or subtraction statements**, for example:

29 + ☐ = 34 34 – 29 = ☐

Children identify **how much to add to any two-digit number to reach the next multiple of 10**, using their knowledge of number bonds to 10; for example, they solve 32 + ☐ = 40. They find as many ways as possible to complete a missing-digit calculation such as ☐1 + ☐ = ☐0, recording their results in a logical way and explaining the patterns and relationships in their results.

Children **add or subtract multiples of 10** by counting in tens. For example they work out 84 – 30 by counting back in tens: 74, 64, 54. Children use a 100-square or jottings on an empty number line

to support their method; they then visualise the numbers and dispense with the support. Children **recognise patterns** in examples such as 90 – 20 = 70 and 9 – 7 = 2 and use their knowledge of number bonds to remember and **recall the sums and differences of multiples of 10**.

Children **solve word problems** using any one of the four operations. Given the problem of sharing 15 grapes equally among three people, for example, they identify an appropriate operation and record the solution as a number sentence. They use equipment, jottings, drawings or symbols to support their method. They record their work, describe their own method and compare it with others' methods.

Unit 2A3 2 weeks

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Present solutions to puzzles and problems in an organised way; explain decisions, methods and results in pictorial, spoken or written form, using mathematical language and number sentences *I can show and explain clearly how I solved a problem*	How did you know what information to use? Where did you decide to start? Is there a pattern in your results? Could you record your results in order to help you see patterns? Have you found all of the ways? Is there a different way to solve the problem?
• Read and write two-digit and three-digit numbers in figures and words; describe and extend number sequences and recognise odd and even numbers *I can read and write numbers up to 1000 in figures and in words* *I can explain the pattern for a sequence of numbers and work out the next few numbers in the list*	What is the largest number you know how to write in figures? I know a secret sequence. It has the numbers 13, 15, 17, 19 in it. What numbers come next in my sequence? What numbers come before? What clues did you use to work this out? Give me a number greater than 40 that is in my secret sequence. How do you know this number is in my sequence? How could you check? If you count in tens from 32, which digit changes? Why doesn't the ones digit change? If you start with 84 and count back in tens, what would be the smallest number you reach on a 100-square? Would 13 be one of the numbers you say? How do you know?
• Count up to 100 objects by grouping them and counting in tens, fives or twos; explain what each digit in a two-digit number represents, including numbers where 0 is a place holder; partition two-digit numbers in different ways, including into multiples of 10 and 1 *I can use partitioning to help me to carry out calculations*	What numbers go into the boxes? 53 = 30 + ☐ 67 – 30 = ☐ Can you find two different ways to work out the answer to each of these calculations? 27 + 40 23 – 18
• Order two-digit numbers and position them on a number line; use the greater than (>) and less than (<) signs *I can write numbers in order and position them on a number line* *I can use the greater than and less than symbols to show that one number is larger or smaller than another*	[Give the children six digit cards, including 0 and at least one digit repeated twice, for example: 0 4 5 5 7 8] Make three 2-digit numbers using these cards. Where would they go on a number line? Now make three different numbers using the same cards. Position these on a number line. Look at this number sentence: ☐ + ☐ = 20 What could the missing numbers be? What is different about this number sentence? ☐ + ☐ < 20 How would you choose numbers to make it correct? Can you choose numbers to make this correct? 30 > ☐ – ☐
• Estimate a number of objects; round two-digit numbers to the nearest 10 *I can say roughly how many there are in a group of objects*	I think of a number and round it to the nearest 10. The answer is 70. What could my number be?
• Add or subtract mentally a one-digit number or a multiple of 10 to or from any two-digit number; use practical and informal written methods to add and subtract two-digit numbers *I can add and subtract two-digit numbers using practical equipment or written notes to help me*	Show me how you could use a number line/bead-string/written notes to work out the answer to these calculations: 38 + 20 49 – 27 58 + 34 72 – 14 Can you work out the answer a different way? Which way do you find most helpful? Why?

Objectives *Children's learning outcomes in italic*	Assessment for learning
• Understand that subtraction is the inverse of addition and vice versa; use this to derive and record related addition and subtraction number sentences *I know when it is easier to use addition to work out a subtraction*	Look at this number sentence: 74 – 13 = 61 Write three more number sentences using these numbers. How do you know, without calculating, that they are correct? What addition facts can you use to help you calculate these? 12 – 5, 19 – 8 Explain how the addition facts helped you. I think of a number, I subtract 19 and the answer is 30. What is my number? How do you know?
• Use the symbols +, –, ×, ÷ and = to record and interpret number sentences involving all four operations; calculate the value of an unknown in a number sentence (e.g. ☐ ÷ 2 = 6, 30 – ☐ = 24) *I can work out the missing number in a number sentence such as* 14 + ☐ = 35	14 + ☐ = 35. What is the missing number? How do you know? What subtraction could you do to find the answer? How many different ways can you find of adding three numbers to make 11? Choose three numbers for the square boxes and use + or – in the circles to make this number sentence correct. ☐ ○ ☐ ○ ☐ = 11
• Respond to presentations by describing characters, repeating some highlights and commenting constructively *I can listen carefully to someone explaining how they solved a problem, and ask a question or suggest another method*	Listen to how the problem was solved. Was your method the same in some way? Did you do something differently? Could you use this method to solve a similar problem? Could you teach someone else to use your method? Which method takes the fewest steps? Which method is easiest to follow?

Learning overview

Children use their knowledge of **counting on from or back to zero** in steps of 2, 5 and 10 to answer multiplication and division questions such as 7 × 2 and 40 ÷ 5. They understand that one way to work out 40 ÷ 5, for example, is to find out how many fives make 40. They know that this can be done by counting in fives from zero.

Children **describe patterns** in the sequences they generate when they count on or back from any two- or three-digit number in steps of 1, 2, 3, 5 and 10. For example, they recognise that when they count in twos the numbers are all odd or all even, whereas when they count in fives the numbers are odd, even, odd etc. They **find missing numbers in simple sequences**, for example:

☐, 48, 51, 54, ☐, 60, …

Children **count a set of objects by grouping them into twos, fives or tens**. They build on this experience to make sensible estimates of sets of objects, explaining their decisions. They **round two-digit numbers to the nearest 10** and state, for example, that a pot containing 27 pencils contains about 30 pencils.

Children **order a set of two-digit numbers**, such as 52, 25, 5, 22, 2, 55. They explain their decisions. They understand and use the < and > symbols; for example, they write a two-digit number to make the statement 56 > ☐ true. They partition two-digit numbers in different ways.

Children use partitioning, counting strategies and knowledge of number bonds to **add or subtract a one-digit number or a multiple of 10 to any two-digit number**. To work out 86 – 50, for example, they might partition and calculate:

86 – 50 = 80 + 6 – 50 = 80 – 50 + 6 = 30 + 6 = 36

Similarly, to find the total number of people on a bus with 14 people on the top deck and 8 below, they might use:

14 + 8 = 14 + 6 + 2 = 20 + 2 = 22

Children **add or subtract two-digit numbers** using practical and informal methods and their knowledge of the relationships between operations. For example, they count back along a number line to find 64 – 25 or count up from 67 to find the answer to 94 – 67. They represent such calculations as number sentences. They calculate the value of an unknown in a number sentence such as □ ÷ 2 = 6 or 85 – □ = 29. They recognise, for example, that to answer 85 – □ = 29 they could use the related addition 29 + □ = 85

Children apply their knowledge to **solve problems using any of the four operations** such as:

Amit spent 24p. He spent 8p more than Amy. How much did Amy spend?

Class 2 has the same number of boys and girls. There are 30 children in Class 2. How many girls are there?

Emma went into a shop at 10:30. She came out at 11:15. How long was she in the shop?

Children identify appropriate operations and **explain and record their calculations in number sentences**. They write their own word problems to match a given calculation such as 72 – 45. They work individually and in pairs to **solve problems and puzzles** involving understanding of numbers and operations, for example:

Use 1, 4, 5 and +, –, =.
How many different answers can you make?