



Year 2 LTP Maths

Year 2 Key Representations

Find out more...

Watch the **Unit tutorial** before planning each unit.

Read the **planning guides** for suggestions of representations.

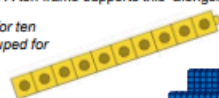
Make use of **PD videos** on unit pages and Progression in Calculations page.



Representations of number

Pupils have primarily used counters, cubes and other discrete objects to represent number. Cubes have been used to support the process of **regrouping** – one ten is equal to ten ones. A ten frame supports this alongside number bonds for 10. Both are used to represent teen numbers.

One ten is regrouped for ten ones. Ten ones is regrouped for one ten.



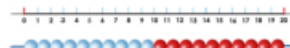
17 is one ten and seven ones.



Pupils have also encountered Dienes equipment to represent larger integers to 100. Counting in tens to identify these numbers has also been developed.

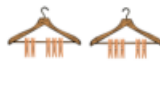
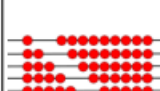
Number lines

Number lines can be used to represent and compare numbers and can be used alongside a bead string. They demonstrate the continuous nature of the number system. Pupils have ordered numbers on a number line.



Number bond knowledge

Pupils should be increasingly fluent in number bond recall for all numbers to 10 and use representations to consider commutativity.



Deriving facts

Pupils use known facts such as number bonds and understanding of place value and magnitude to derive further facts. Commutativity for addition is also used.

*If I know $3 + 4 = 7$ then I know $13 + 4 = 17$
If I know $3 + 4 = 7$ then I know $4 + 3 = 7$*

Comparing numbers

Pupils have experienced a range of language to compare numbers.



*Five is less than seven. Five ones is fewer than seven ones.
Seven is greater than five.
Six is between five and seven. It is after five and before seven.*

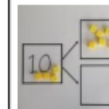
Part-whole language and representations

A part-whole model is used to represent the relationship between numbers and will have been used for addition and subtraction. The model is made of a **whole** and two or more **parts**.



*whole = part + part
 $10 = 6 + 4$*

By moving the manipulatives the model represents subtraction. Care should be taken to ensure connections between the movement of the manipulatives: *I subtract one part of six. I am taking away one part of six.*



The whole is ten. I subtract one part of six. The missing part is four. Ten subtract six is equal to four.

*whole - part = part
 $10 - 6 = 4$*

Equations

The phrase 'is equal to' is used consistently to refer to the = symbol. What is on one side of the symbol is equal to what is on the other side. Present equations in different ways to support this:

$$7 = 3 + 4$$

$$3 + \square = 7$$

The 'make 10' strategy

Pupils apply number bonds to 10 to calculate how many more/less to the next multiple of ten. They partition the part into two parts to calculate mentally. Using concrete or pictorial representations can scaffold thinking.

$8 + 6 = ?$ I know eight and two make 10 so I can partition six into two and four.



Ten more / ten less

Pupils have explored ten more and ten less than numbers within 50 using manipulatives. They also skip count on and back in tens from different starting points. Mental recall of this can be developed in Maths Meetings.

Finding the difference

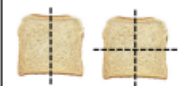
Pupils recognise that in a subtraction calculation where the numbers are close together in value, a count on strategy can be used to find the difference.



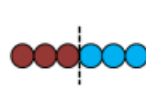
$32 - 25 = ?$ I can count on from 25 to find the difference. Five more is 30, two more is 32. The difference is seven.

Representing fractions

Pupils identify half and quarter of a shape and a quantity within 20 using practical experiences including equal sharing for a quantity. They are also familiar with half turns, linking this to half past on a clock face.



*One half is one of two equal parts.
One quarter is one of four equal parts.*



Half of six is three.

One quarter of eight is two.



Doubling and halving

Pupils have had opportunities to represent doubling and halving within 20 using concrete and pictorial representations. This is connected to their understanding of half. Some facts will be recalled.



*Double three is six. Three plus three is equal to six.
Half of six is three. Six take away three is equal to three.*



Division by sharing / grouping

Pupils have been exposed to the concept of division within 20 through equal grouping and equal sharing. They have also explored unequal grouping and sharing. Pupils should explore the terms grouping and sharing and be familiar with both.



20 shared into five equal groups gives four in each group.



20 grouped into groups of five gives four groups.



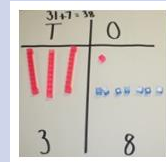
Calculation Policy Year 2

NC statement and guidance

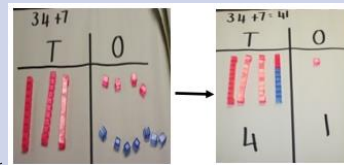
Add a two-digit number and a one-digit number

Children progress to a more formal concrete method of addition using a place value chart. Base ten supports the transition from a concrete method to a pictorial method of addition as well as addition crossing the tens boundary.

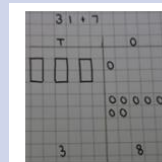
Children begin by addition one digit numbers where the answer does not cross the tens boundary. In the example to the left, 31 is represented in pink and 8 in blue. Children count the number of units and the number to tens to find the answer. Beginning in the units column.



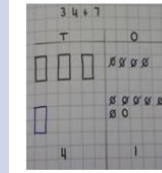
Children progress into adding where the calculation crosses the tens boundary. In the example below children can use ten ones to make a new tower of ten



When moving to pictorial methods, children use a written variation of the base ten used previously. Each number is drawn into the place value chart. Children begin by adding the units and then the tens.



Children progress into crossing the tens boundary. In the example to the left, both values have been drawn. It is recognised that there are more than ten units in the ones column and so these are crossed out (as seen in purple) and a new tower of ten is drawn.

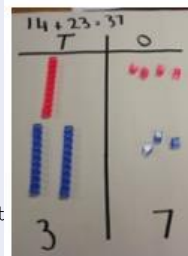


Children then count the remaining units first and then the tens.

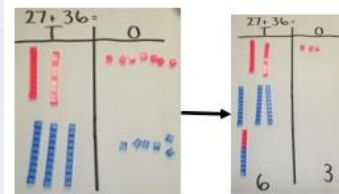
Add two two-digit numbers

Children progress to a more formal concrete method of addition using a place value chart. Base ten supports the transition from a concrete method to a pictorial method of addition.

Children begin by adding two two-digit numbers that do not cross the tens boundary. In the example to the left, 14 is represented in pink and 23 is represented in blue. The number of units are counted followed by the number of tens in order to calculate the total.

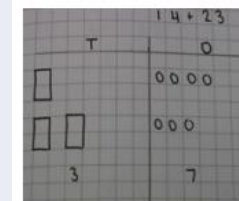


Children progress into adding two-digit numbers where the answer crosses the tens boundary. The two numbers are represented in pink and blue. It has been recognised that there are more than ten ones and so a new tower of ten can be made.



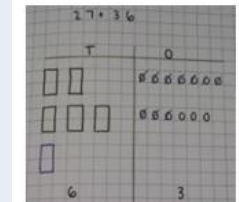
The remaining ones and the tens are counted to calculate a total.

When moving into a pictorial method, children use a written variation of base ten. Children draw both numbers into the place value chart.



They begin by adding the units and then adding the tens to find a total.

Children progress into a pictorial method of adding two-digit numbers where the answers crosses the tens boundary. The two numbers are drawn into the place value grid. It has been recognised that there are more than ten ones so 10 of these have been crossed out (in purple) and a new tower of ten has been drawn.



The remaining ones and the tens are counted to calculate a total.

Calculation Policy Year 2

NC statement and guidance

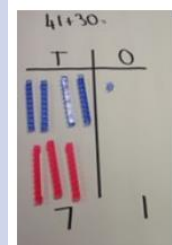
Add a two-digit number and a multiple of ten

Children become familiar with both concrete and pictorial methods of multiplication. Children understand multiplication as making equal groups.

Children are shown how to complete this calculation using base ten equipment.

41 and 30 are represented with the blue and pink base ten.

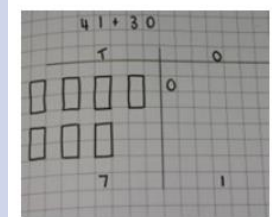
Children count the ones and the tens column to find a total.



CPA

Children progress into using a pictorial representation of base ten.

They draw each value into their place value grid and then add the tens and the units.



Add three one-digit numbers

Children learn to add three one-digit numbers. Children should learn that they can add the three numbers in any order due to the commutative nature of addition.

Children are shown how to complete this calculation using base ten equipment.

2, 6 and 5 are all drawn into the ones column of the place value grid.

It is recognised that there are more than ten ones so these are grouping together to make a tower of ten.

Children count the remaining ones and the number of tens that they have.



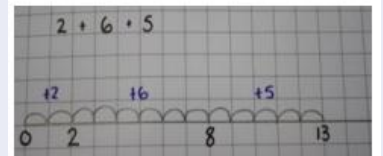
Children progress into using a pictorial version of base ten.

Each of the one-digit numbers are presented in a different colour.

It is recognised that there are more than ten ones and so these are crossed out to make a tower of ten.

As an alternative method, children may use a number line to add the three numbers.

Starting at zero then making the correct amount of jumps.



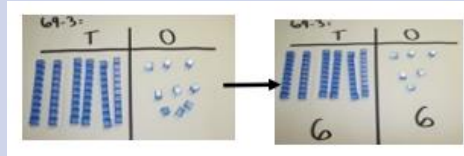
Calculation Policy Year 2

NC statement and guidance

Subtract a two-digit number and a one-digit number

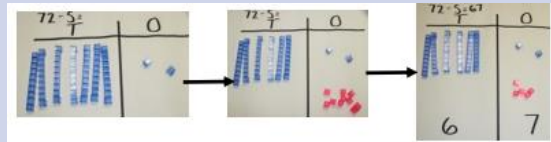
Children progress to a more formal concrete method of subtraction using a place value chart. Base ten supports the transition from a concrete method to a pictorial method of subtraction as well as subtraction crossing the tens boundary.

Children begin by using base ten to subtract a one-digit number from a two-digit number which does not require exchange. In the diagram (right), children represent the starting value in the grid. They take the required number of ones and write the value that remains.



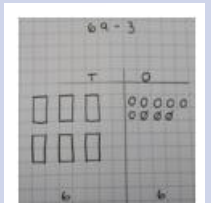
Children progress into exchange. They represent the starting value in the grid. It is recognised that there are only 2 ones and so we can not take the required 5 away.

As seen in pink, one ten is exchanged for ten ones. The 5 ones can be subtracted. The remaining ones and tens are counted to complete the answer.



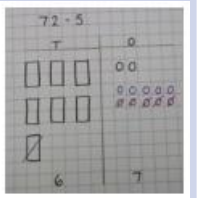
Children progress into a pictorial version of using base ten.

Children draw the starting number into their place value grid. They cross out the required number of ones and write the amount that remains.



When exchange is required, children begin using the same process. They represent the starting number in their place value grid.

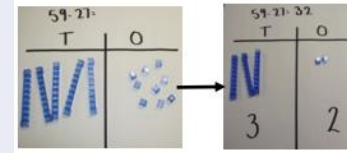
It is recognised that there are not enough ones to take away. Children cross out one tower of ten and exchange this for ten ones (as seen in purple on the example). The required 5 can then be subtracted.



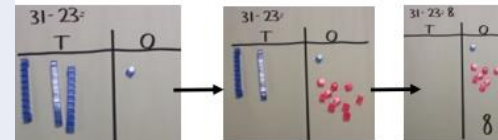
Subtract two two-digit numbers

Children progress to a more formal concrete method of subtraction using a place value chart. Base ten supports the transition from a concrete method to a pictorial method of subtraction as well as subtraction crossing the tens boundary.

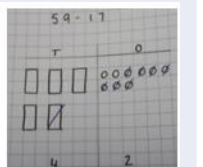
Children begin by using base ten to subtract a two-digit number from a two-digit number which does not require exchange. In the diagram (right) children represent the starting value in the grid. They take the required number of ones away followed by the required number of tens to find the correct answer.



Children progress into questions where they need to exchange. In the diagram (right), children represent the starting value in the grid. It is recognised that they can not take away the required number of ones and therefore need to exchange a tower of tens (pink). They can take the required number of ones followed by the required number of tens to find the correct answer.

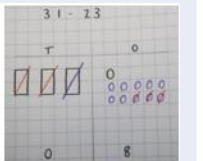


Children move into a pictorial method of subtraction. They draw the starting value into the grid. They subtract the required number of ones the required number of tens (purple). Then count the remaining ones and tens to find the answer.



Children move into a pictorial method where they need to exchange.

They draw the starting value into the grid. They recognise that they can not subtract the required number of ones and so exchange a tower of ten (purple) they can subtract the correct number of ones and then tens (orange). Finally, they count the remainder to complete the answer

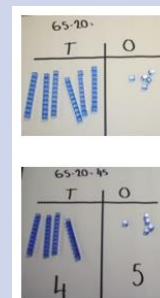


Subtract a two-digit number and a multiple of ten

Children learn concrete and pictorial methods of subtracting a two-digit number and a multiple of ten. Children may progress and talk about how this calculation may be done mentally.

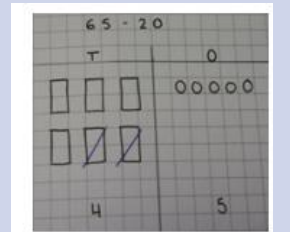
Children begin by using base ten to subtract a two-digit number and a multiple of ten.

Children begin by representing the starting value using base ten then taking away the required number of tens.



Children progress into a pictorial method of base ten.

They draw the starting value into the grid then cross the required number of tens to find the correct answer.



Calculation Policy Year 2

NC statement and guidance

Calculate mathematical statements for multiplication within the multiplication tables using the multiplication symbol (\times) and equals symbol ($=$)

Children use concrete representations to support a range of pictorial methods to multiply. Children understand the commutative nature of multiplication and that their array will look different dependent upon the order of number within the multiplication.

Calculate mathematical statements for division within the multiplication tables using the division symbol (\div) and equals symbol ($=$)

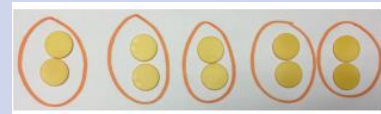
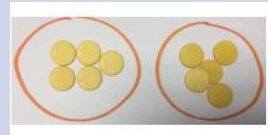
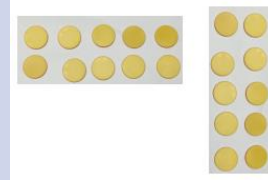
Following on from initial understanding in Year 1, children understand the difference between sharing and grouping.

CPA

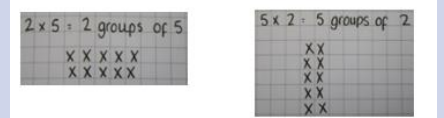
Children use the counters, or other objects, to represent arrays.

These are labelled correctly. In the first example 2 groups of 5 (2×5) and in the second example 5 groups of 2 (5×2).

Children use concrete objects to multiply making equal groups.



Children can draw an array to solve a multiplication with the number of groups going horizontally down and the amount within the group vertically across as seen (right).



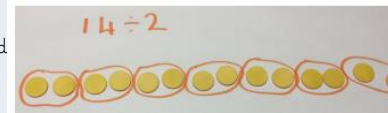
Children can draw circles to show the number of groups and place dot/crosses within the circle to represent the amount within that group.



They can then progress to writing the number in that group in digit form showing a running total.

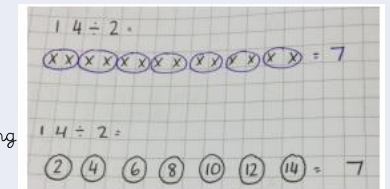
Children can use concrete objects to divide whether this be counters or counting objects.

Children get the correct number of counters and share these into groups of 2 giving 7 groups.



Children move onto pictorial method.

They draw the correct number of circles and the circle groups of 2 which gives 7 groups.



	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Autumn 1	Previous misconception	<p>Number and Place Value</p> <p>Read and write numbers to at least 100 in numerals and words</p> <p>[Key] Partition any two-digit number into different combinations of tens and ones, explaining their thinking verbally in pictures or using apparatus</p> <p>AMM link - Unit 1 (lessons 1-6)</p>	<p>Addition and Subtraction</p> <p>Solve problems with addition and subtraction using concrete and pictorial representation, including those involving numbers, quantities and measure.</p> <p>Add and subtract numbers using concrete objects, pictorial representations, and mentally, including two two-digit numbers.</p> <p>[Key] Recall all number bonds to and within 10 and use these to reason with and use these to reason with and calculate bonds to and within 20, recognising other associated additive relationships (e.g. if $7+3=10$, then $17+3=20$, if $7-3=4$, then $17-3=14$; leading to if $14+3=17$, then $3+14=17$, $17-4=3$ and $17-3=4$)</p> <p>Add and subtract numbers using concrete objects, pictorial representations and mentally including a two-digit number and ones.</p> <p>AMM link - Unit 2 (lessons 1-5)</p> <p>And AMM link - Unit 3 (lessons 1-9)</p>			Test week	Consolidation week	<div>-----</div> <div>-----</div> <div>-----</div> <div>-----</div> <div>-----</div> <div>-----</div>
Autumn 2	<p>Shape and Position</p> <p>[Key] Name and describe properties of 2D shapes, including the names of sides, vertices, edges, faces and lines of symmetry</p> <p>Compare and sort common 2D and 3D shapes and everyday objects</p> <p>[Key] Name and describe properties of 3D shapes, including the number of sides, vertices, edges faces and lines of symmetry</p> <p>FROM SPRING Identify 2D shapes on the surfaces of 3D shapes</p> <p>Including symmetry taught in line with assessment framework</p> <p>AMM link - Unit 11 (lessons 1-8)</p>		<p>Measure</p> <p>Choose and use appropriate standard units to estimate and measure length/height in any direction; mass; temperature; capacity to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels.</p> <p>Recognise and use symbols for pounds and pence; combine amounts to make a particular value</p> <p>AMM link - Unit 4 (lessons 1-4)</p> <p>And Unit 10 (lessons 1-4)</p> <p>And Unit 13 (lessons 1-4)</p> <p>And Unit 14 (lessons 1-2)</p>			<p>Addition and Subtraction</p> <p>FROM SPRING [Key] Add and subtract any 2 two-digit numbers using an efficient strategy, explaining their method verbally, in pictures or using apparatus</p> <p>FROM SPRING Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot</p> <p>Measure (include within)</p> <p>FROM SPRING To solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change</p> <p>AMM link - Unit 2 (lessons 6-9)</p> <p>And AMM link - Unit 10 (lessons 5-8)</p>		<div>-----</div> <div>-----</div> <div>-----</div> <div>-----</div> <div>-----</div> <div>-----</div>

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Spring 1	<p>Number and Place Value</p> <p>Compare and order numbers from 0 up to 100</p> <p>Use greater than, less than and = signs</p> <p>[Key] Read scales (such as number lines or a graph axis) in divisions of ones, twos, fives and tens</p> <p>Shape and Position [include within]</p> <p>Order and arrange combinations of mathematical objects in patterns and sequences</p> <p>AMM link - Unit 1 (lessons 7-9) not all covered by AMM</p>	<p>Addition and Subtraction</p> <p>[Key] Add and subtract any 2 two-digit numbers using an efficient strategy, explaining their method verbally, in pictures or using apparatus</p> <p>AMM link - Unit 9 (lessons 1-6)</p>	<p>Multiplication and Division</p> <p>Calculate mathematical statements for multiplication and division within the multiplication tables and written then using the multiplication, division and equals signs</p> <p>Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot</p> <p>AMM link - Unit 6 (lessons 1-9)</p>		<p>Fractions</p> <p>[Key] Identify $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, $\frac{3}{4}$ of a number of a shape and know that all parts must be equal parts of the whole</p> <p>AMM link - Unit 8 (lessons 1-5)</p>	Test week	<p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p>	<p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p>
Spring 2	Consolidation week	<p>Measure</p> <p>Continue to compare and order lengths, mass, volume/capacity and record the results using symbols for greater than, less than and =</p> <p>AMM link - Unit 4 (lesson 8)</p> <p>And Unit 13 (lessons 5-9)</p> <p>And Unit 14 (lessons 3-5)</p>		<p>Statistics</p> <p>Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.</p> <p>Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity</p> <p>AMM link - Unit 5 (lessons 1-5)</p>	<p>Measure</p> <p>To know the number of minutes in an hour and the number of hours in a day</p> <p>To compare and sequence intervals of time</p> <p>[Key] To read the time on a clock to the nearest 15 minutes</p> <p>AMM link - Unit 7 (lessons 1-9)</p>		<p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p>	<p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p>

	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8
Summer 1	<p>Number and Place Value</p> <p>Revisit and apply based on gaps in learning</p> <p>AMM link - <i>not covered by AMM</i></p>	<p>Addition and Subtraction</p> <p>FROM SPRING [Key] Add and subtract any 2 two-digit numbers using an efficient strategy, explaining their method verbally, in pictures or using apparatus</p> <p>Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems</p> <p>AMM link - Unit 9 (lessons 7-9)</p> <p>And Unit 15 (lessons 1-8)</p>			<p>Multiplication and Division</p> <p>FROM SPRING [Key] Recall multiplication and division facts for 2, 5, and 10 and use them to solve simple problems, demonstrating an understanding of commutativity as necessary</p> <p>Solve problems involving multiplication and division using materials, arrays repeated addition mental methods and multiplication and division facts, including problems in context</p> <p>AMM link - Unit 6 (lessons 10-13)</p>	<p>Fractions</p> <p>FROM SPRING [Key] Identify $\frac{1}{4}$, $\frac{1}{3}$, $\frac{1}{2}$, $\frac{2}{4}$, $\frac{3}{4}$ of a number of a number and know that all parts must be equal parts of the whole</p> <p>FROM SPRING Write simple fractions for example $\frac{1}{2}$ of 6 = 3 and recognise the equivalences of $\frac{2}{4}$ and $\frac{1}{2}$</p> <p>AMM link - Unit 8 (lessons 6-9)</p>	<p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p>	<p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p> <p>-----</p>
Summer 2	<p>Shape and Position</p> <p>Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti)</p> <p>AMM link - Unit 11 (lessons 9-14)</p>	<p>Test week</p>	<p>Measure</p> <p>Continue to solve simple problems in a practical context involving addition and subtraction of the same unit</p> <p>AMM link - Unit 4 (5-7)</p>	<p>Consolidation 2 weeks</p> <p>Based on test week and before statutory assessment return</p>		<p>Year 3 Prep - Number and place value</p> <p>To compare and order numbers up to 1000</p> <p>Continue to use greater than, less than and = signs</p> <p>AMM link - Unit 12 (lessons 1-5)</p>	<p>Year 3 Prep - Multiplication and Division revision</p> <p>Solve problems involving multiplication and division using materials, arrays repeated addition mental methods and multiplication and division facts, including problems in context</p> <p>AMM link - Unit 16 (lessons 1-14)</p>	