The Dean Trust Calculation Policy

Addition and Subtraction

The Dean Trust Calculation Policy EYFS

Addition and Subtraction

EYFS Addition and Subtraction
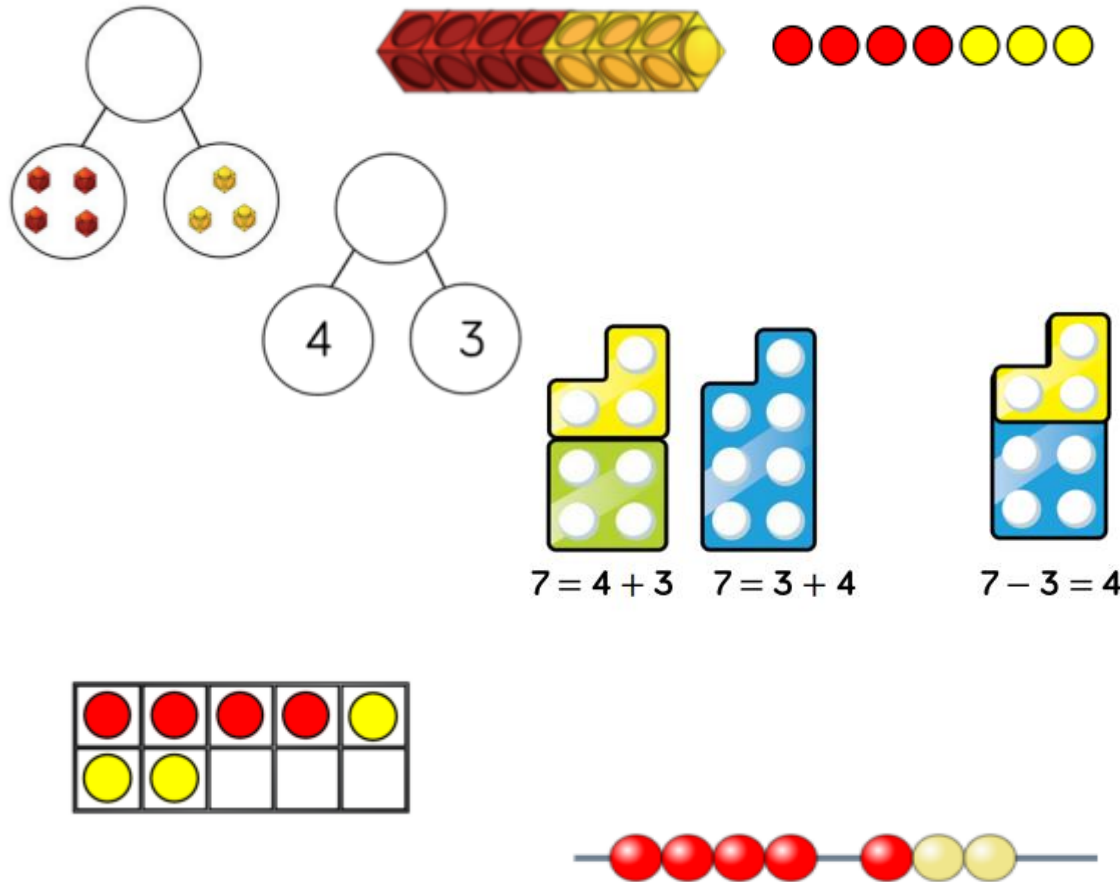
The part- whole model supports the understanding of aggregation and partitioning

Cubes can be useful to support pupils with addition and subtraction of one-digit numbers.

Number shapes can be useful to support pupils to subitise numbers as well as explore aggregation, partitioning and number bonds.

$7 = 4 + 3$ $7 = 3 + 4$ $7 - 3 = 4$

Skill: Recognising when one quantity is greater than, less than or equal to.

Part – part – whole model can be used to show addition and support number bond recognition.

Pupils need opportunities to apply their understanding by comparing actual numbers and explaining which is more.

Pupils can compare numbers that are far apart, near to and next to each other.

Early Years | NCETM

The Dean Trust Calculation Policy Year 1

Addition and Subtraction

Year 1 Addition and Subtraction

National Curriculum Objectives
- read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs
- represent and use number bonds and related subtraction facts within 20
- add and subtract one-digit and two-digit numbers to 20, including zero
- solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = – 9

The part- whole model supports the understanding of aggregation and partitioning

The single bar model is a type of part-while model that can support pupils in representing the structure.

Number shapes can be useful to support pupils to subitise numbers as well as explore aggregation, partitioning and number bonds.

$$4 + 3 = 7$$
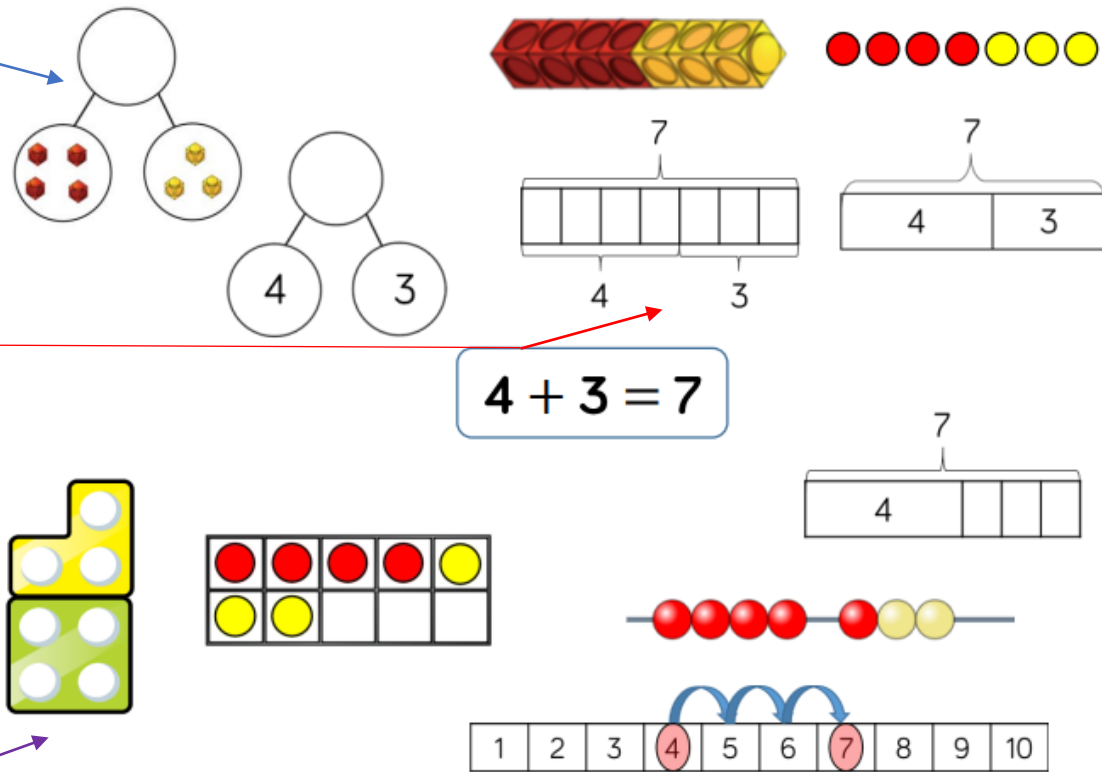
Skill: Adding 1 digit numbers within ten

When adding numbers to 10, pupils can explore both aggregation and augmentation.
The part-whole model, discrete and continuous bar model, numbers shapes and ten frame support aggregation.
The combination bar model, ten frame, bead string and number track all support augmentation.

Aggregation - when they need to combine two or more quantities (like sets of objects, money, distance, volume, etc.) to obtain single quantity. (e.g., if Munni has 3 pencils and Munna has 2, how many pencils are there altogether?)

Augmentation -.where a quantity is to be increased (or augmented) by some amount, and the increased value has to be obtained. (e.g., to a crate containing 5 bottles, 4 more are added. HOW many bottles wit1 the crates now have?)

Number, Addition and Subtraction | NCETM
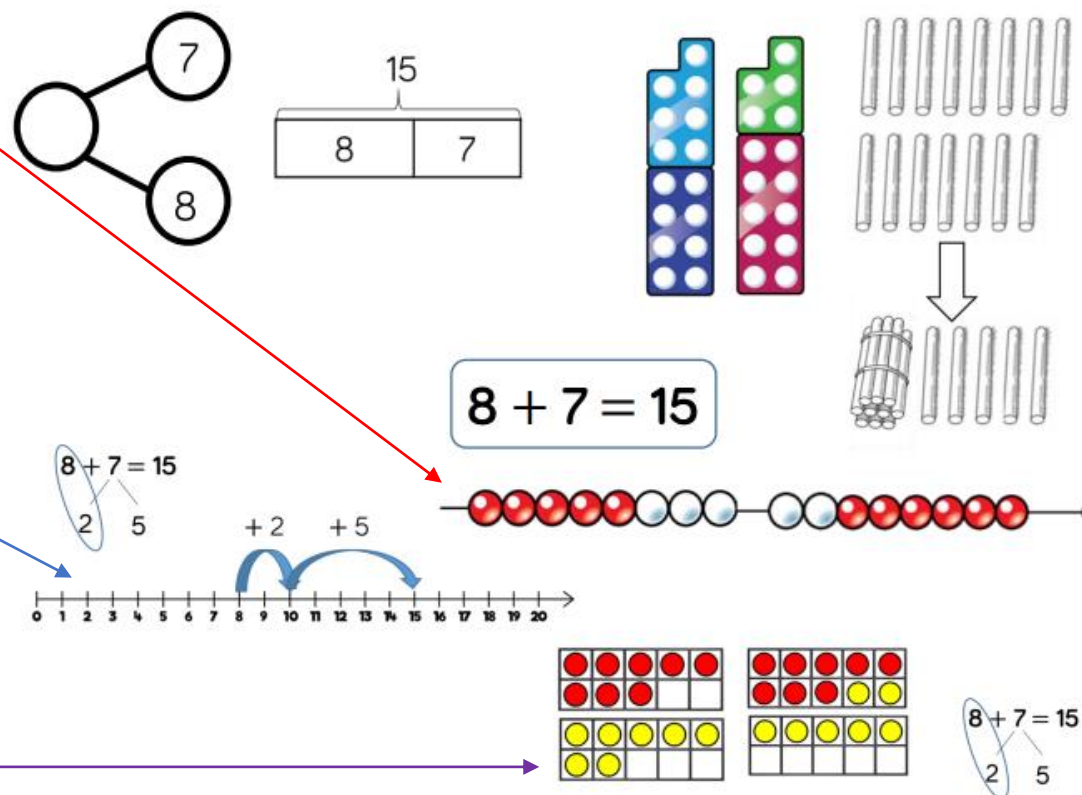
Year 1 Addition and Subtraction

National Curriculum Objectives
- read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs
- represent and use number bonds and related subtraction facts within 20
- add and subtract one-digit and two-digit numbers to 20, including zero
- solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = − 9

Bead strings to 20 help pupils to investigate number bonds to 20.

Number lines can be used to make the jump to the nearest 10, which is also supported using ten frames.

When adding two single digits, pupil scan make each number on separate ten frames before moving part of one number to make 10.

$8 + 7 = 15$

Skill: Add 1 and 2-digit numbers to 20

When adding one digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.

Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support pupils in understanding how to partition their jumps.

Number, Addition and Subtraction | NCETM
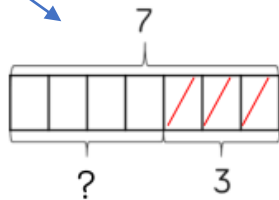
Year 1 Addition and Subtraction

National Curriculum Objectives
- read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs
- represent and use number bonds and related subtraction facts within 20
- add and subtract one-digit and two-digit numbers to 20, including zero
- solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = - 9$
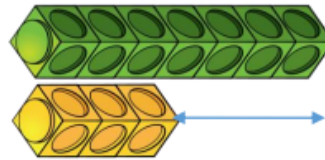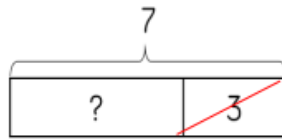
When the whole is complete and at least one part is empty, pupils can use partitioning to find the missing part
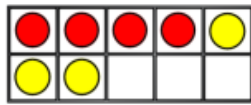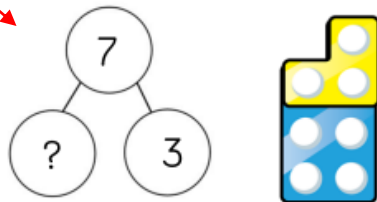
The discrete bar model is a good starting point with smaller numbers as each box represents one whole

When subtracting, pupils count back to find their answer. They start at the minuend and the take away the subtrahend.

$7 - 3 = 4$

First   Then   Now
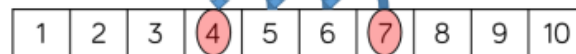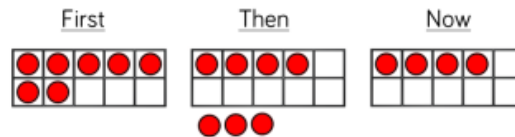
Skill: Subtract 1-digit numbers within 10

Part whole models, bar models, ten frames and number shapes support partitioning.

Ten frames, number tracks, single bar models and bead strings support reduction,

Cubes and bar models with two bars can support finding the difference.

Number, Addition and Subtraction | NCETM
Minuend-a quantity or number from which another is to be subtracted.

Subtrahend-a quantity or number to be subtracted from another.

Year 1 Addition and Subtraction

National Curriculum Objectives
- read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs
- represent and use number bonds and related subtraction facts within 20
- add and subtract one-digit and two-digit numbers to 20, including zero
- solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \quad - 9$

When subtracting, pupils unbundle a group of 10 straws to represent the exchange from 1 ten to 10 ones.

When subtracting numbers pupils can start with the whole and then place one of the parts on top of the whole to see what part is missing. Pupils will be able to subitise the part that is missing.

$$14 - 6 = 8$$

$$14 - 6 = 8$$
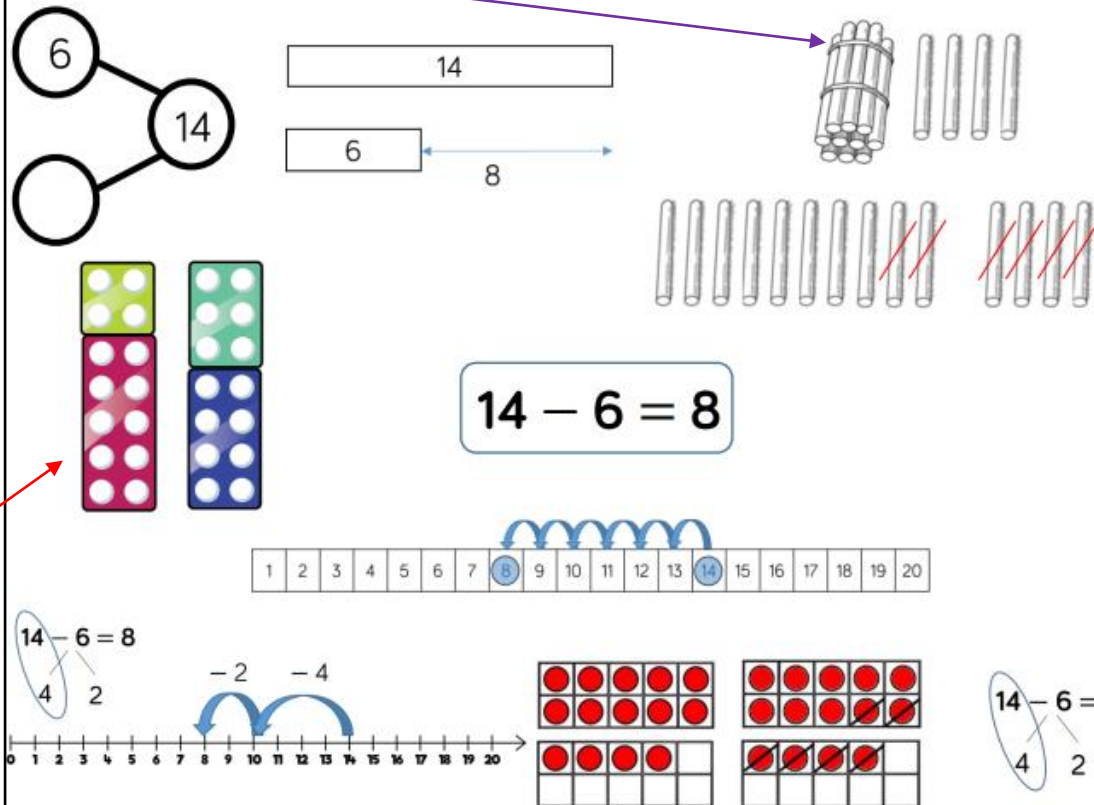
Skill: Subtract 1 and 2-digit numbers to 20

When subtracting one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.

Pupils should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this.

Number, Addition and Subtraction | NCETM

Minuend-a quantity or number from which another is to be subtracted.

Subtrahend-a quantity or number to be subtracted from another.

The Dean Trust Calculation Policy Year 2

Addition and Subtraction

Year 2 Addition and Subtraction

National Curriculum Objectives
- 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

- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
a two-digit number and 1s
a two-digit number and 10s
2 two-digit numbers
adding 3 one-digit numbers
- show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems

Bead strings to 20 help pupils to investigate number bonds to 20.

Number lines can be used to make the jump to the nearest 10, which is also supported using ten frames.

When adding two single digits, pupil scan make each number on separate ten frames before moving part of one number to make 10.

$8 + 7 = 15$

$8 + 7 = 15$

$+ 2$ $+ 5$

Skill: Add 1 and 2-digit numbers to 20

When adding one digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.

Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support pupils in understanding how to partition their jumps.

Number, Addition and Subtraction | NCETM
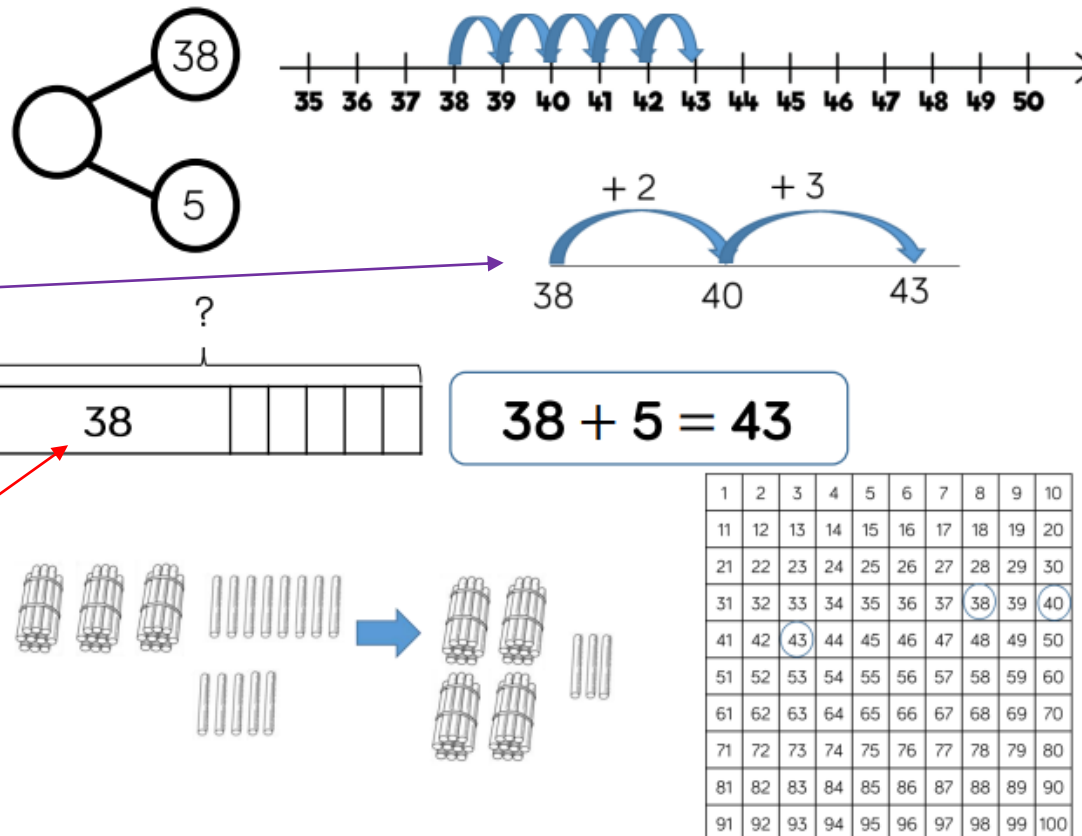
Year 2 Addition and Subtraction

National Curriculum Objectives
- 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

- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
a two-digit number and 1s
a two-digit number and 10s
2 two-digit numbers
adding 3 one-digit numbers
- show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems

Pupils can add numbers by jumping to the nearest 10 and then jumping to the total.

Combination bar models supports the pupils to calculate by counting on from the larger number. It is a good stepping stone towards the continuous bar model.

$$38 + 5 = 43$$

Skill: Add 1 and 2-digit numbers to 100

When adding single digits to a two-digit number pupils should be encouraged to count from the larger number.

Pupils should also apply their knowledge of number bonds to add more efficiently.
e.g. 8+5=13 so 38 +5=43

Hundred squares and straws can support children to find number bonds to ten.
Number, Addition and Subtraction | NCETM

Year 2 Addition and Subtraction

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Believe Achieve Succeed

The continuous bar model is useful for a range of values. The question mark indicates the value to be found.

Using base ten is an effective way to support understanding of column addition. It is important to write out the calculation alongside so that they can see the links between the written method and the model.

$+2$ $+21$

$38 + 23 = 61$

Tens   Ones

38
+ 23
61
1

Tens   Ones

Skill: Add two 2-digit numbers to 100

At this stage encourage pupils to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger straws become less efficient.

Pupils can also use a blank number line to count and find the total. Encourage them to jump to multiples of 10 to become more efficient.

Number, Addition and Subtraction | NCETM
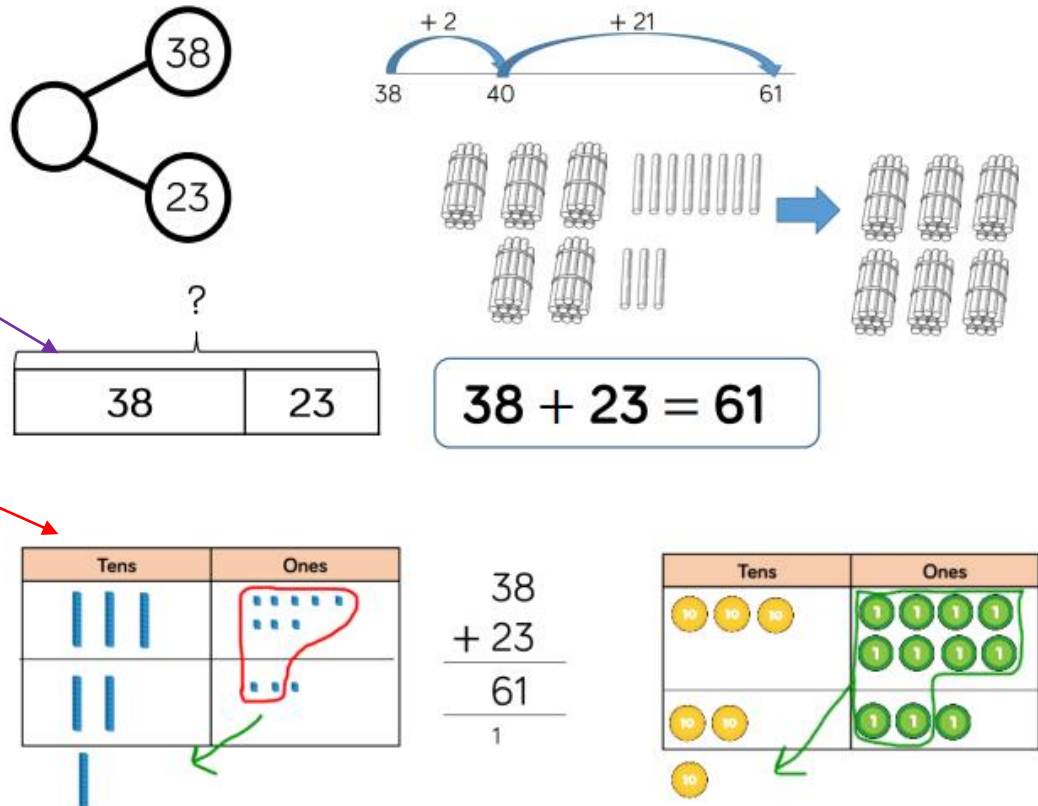
Year 2 Addition and Subtraction

National Curriculum Objectives
- 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

- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100
  add and subtract numbers using concrete objects, pictorial representations, and mentally, including:
  a two-digit number and 1s
  a two-digit number and 10s
  2 two-digit numbers
  adding 3 one-digit numbers
- show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 number from another cannot
- recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems

When subtracting, pupils unbundle a group of 10 straws to represent the exchange from 1 ten to 10 ones.

When subtracting numbers pupils can start with the whole and then place one of the parts on top of the whole to see what part is missing. Pupils will be able to subitise the part that is missing.

$$14 - 6 = 8$$

Skill: Subtract 1 and 2-digit numbers to 20

When subtracting one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.

Pupils should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this.

Minuend-a quantity or number from which another is to be subtracted.

Subtrahend-a quantity or number to be subtracted from another.

Number, Addition and Subtraction | NCETM

Year 2 Addition and Subtraction

THE DEAN TRUST
Believe Achieve Succeed

The continuous bar model is useful for a range of values. The question mark indicates the value to be found.

Using base ten is an effective way to support understanding of column subtraction. It is important to write out the calculation alongside so that they can see the links between the written method and the model.

$$65 - 28 = 37$$
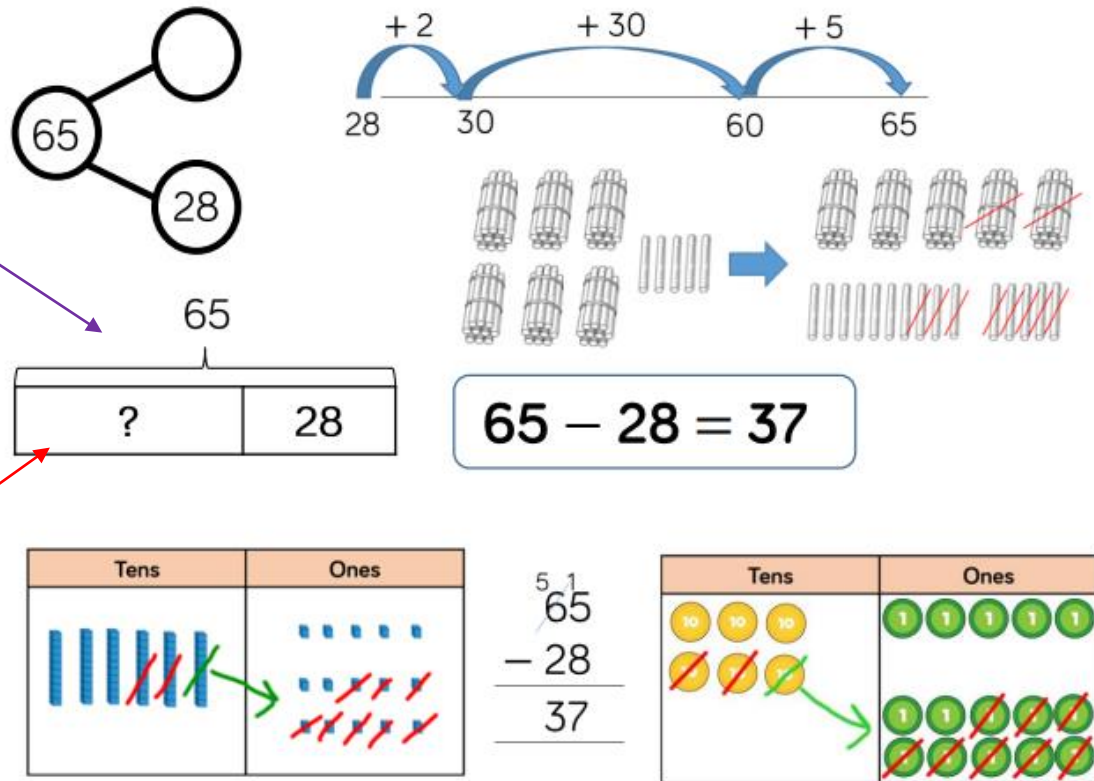
Skill: Subtract 1 and 2-digit numbers to 100

At this stage encourage pupils to use the formal column method when calculating alongside straws or base 10 or place value counters. As numbers become larger straws become less efficient.

Pupils can also use a blank number line to count on to find the difference. Encourage pupils to jump to multiples of 10 to become more efficient.

Number, Addition and Subtraction | NCETM

The Dean Trust Calculation Policy Year 3

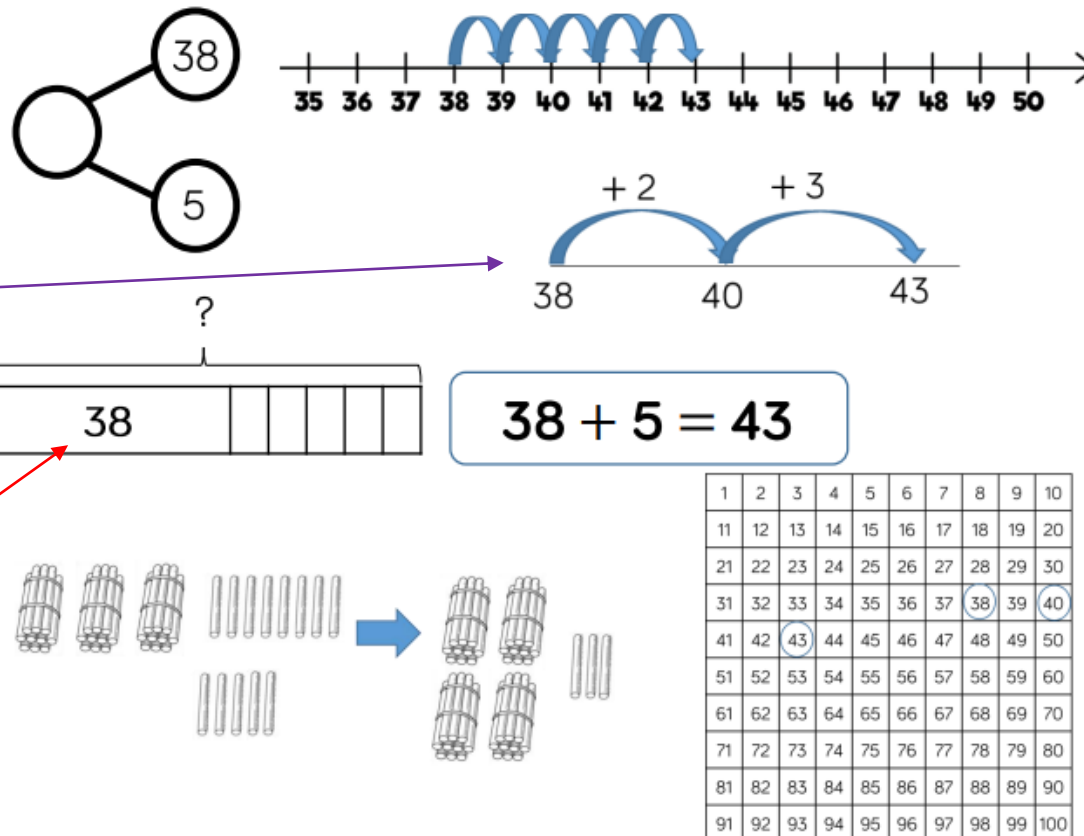Addition and Subtraction

Year 3 Addition and Subtraction

National Curriculum Objectives
- add and subtract numbers mentally, including:
- a three-digit number and 1s
- a three-digit number and 10s
- a three-digit number and 100s

- add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction

Pupils can add numbers by jumping to the nearest 10 and then jumping to the total.

Combination bar models supports the pupils to calculate by counting on from the larger number. It is a good stepping stone towards the continuous bar model.

$$38 + 5 = 43$$

Skill: Add 1 and 2-digit numbers to 100

When adding single digits to a two-digit number pupils should be encouraged to count from the larger number.

Pupils should also apply their knowledge of number bonds to add more efficiently.
e.g. 8+5=13 so 38 +5=43

Hundred squares and straws can support pupils to find number bonds to ten.

Number, Addition and Subtraction | NCETM
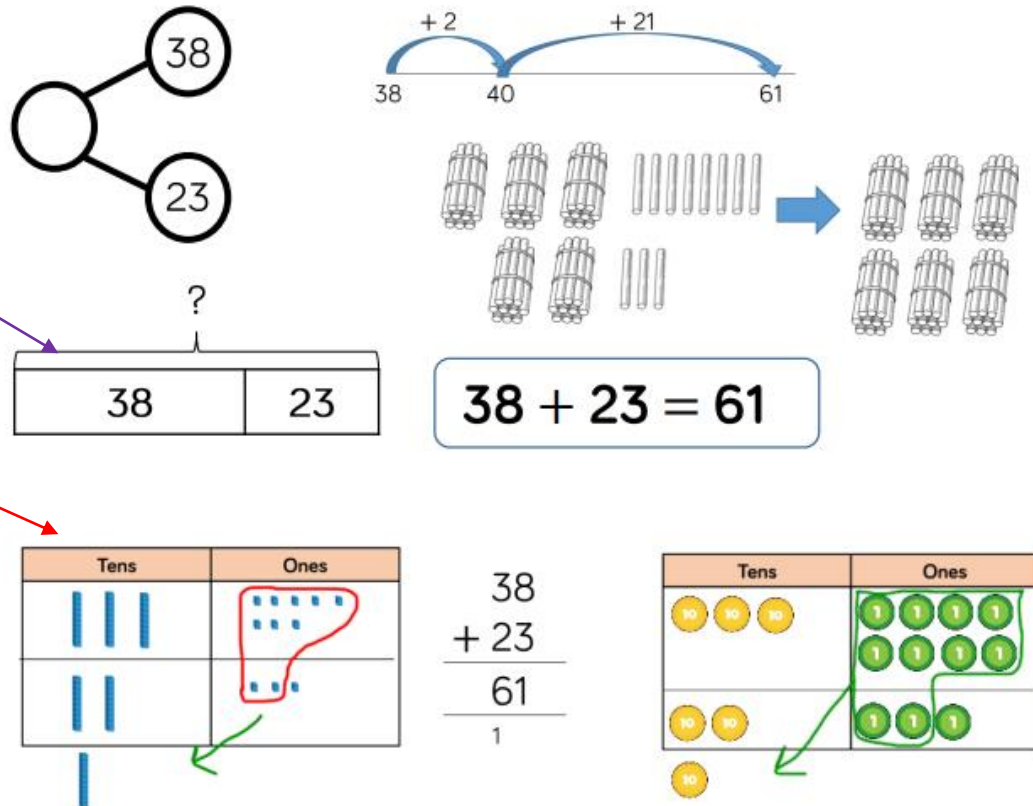
Year 3 Addition and Subtraction

National Curriculum Objectives
- add and subtract numbers mentally, including:
- a three-digit number and 1s
- a three-digit number and 10s
- a three-digit number and 100s

- add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction

The continuous bar model is useful for a range of values. The question mark indicates the value to be found.

Using base ten is an effective way to support understanding of column addition. It is important to write out the calculation alongside so that they can see the links between the written method and the model.

$38 + 23 = 61$

Skill: Add two 2-digit numbers to 100

At this stage encourage pupils to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger straws become less efficient.

Pupils can also use a blank number line to count and find the total. Encourage them to jump to multiples of 10 to become more efficient.
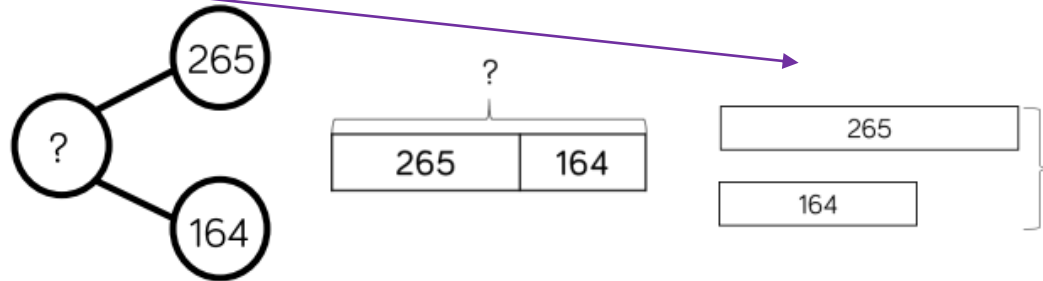
Number, Addition and Subtraction | NCETM

Year 3 Addition and Subtraction

THE DEAN TRUST
Believe Achieve Succeed

When the parts are complete and the whole is empty, pupils use aggregation to add the parts together to find the total.

When adding always start with the smallest place value. The representation becomes less efficient with larger numbers due to the size of base10. Use counters for larger numbers.

$$265 + 164 = 429$$

Skill: Add numbers with up to 3 digits

Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits.

Ensure pupils write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Number, Addition and Subtraction | NCETM

Year 3 Addition and Subtraction

National Curriculum Objectives
- add and subtract numbers mentally, including:
- a three-digit number and 1s
- a three-digit number and 10s
- a three-digit number and 100s

- add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction

Multiple bar models can be used to represent the difference in subtraction.
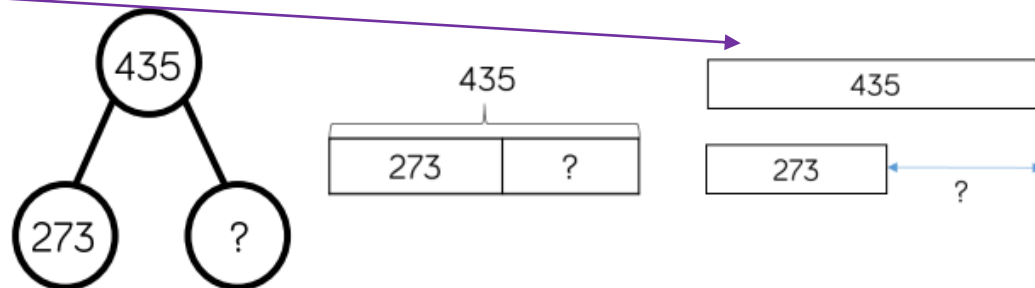
When subtracting always start with the smallest place value. When there are not enough ones/tens/ hundreds to subtract in a column, pupils need to move to the column to the left and exchange. They can then subtract efficiently

$$435 - 273 = 262$$
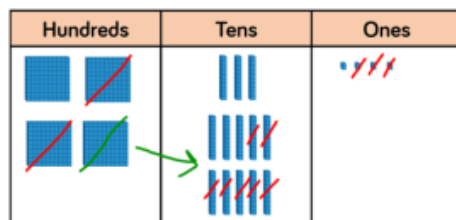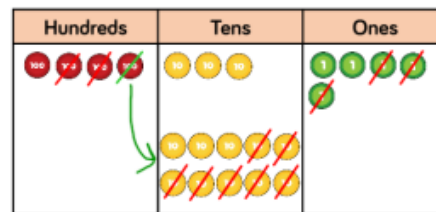
Skill: Subtract numbers with up to 3 digits

Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 3 digits.

Ensure pupils write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Number, Addition and Subtraction | NCETM

The Dean Trust Calculation Policy Year 4

Addition and Subtraction

Year 4 Addition and Subtraction

National Curriculum Objectives
* add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
* estimate and use inverse operations to check answers to a calculation
* solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

When the parts are complete and the whole is empty, pupils use aggregation to add the parts together to find the total.

Pupils should first add without an exchange before moving on to addition with an exchange. Allow pupils to experience the exchange between columns.

$$1,378 + 2,148 = 3,526$$

Skill: Add numbers with up to 4 digits

Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 4 digits.

Ensure pupils write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Number, Addition and Subtraction | NCETM

Year 4 Addition and Subtraction

National Curriculum Objectives
- add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate
- estimate and use inverse operations to check answers to a calculation
- solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.

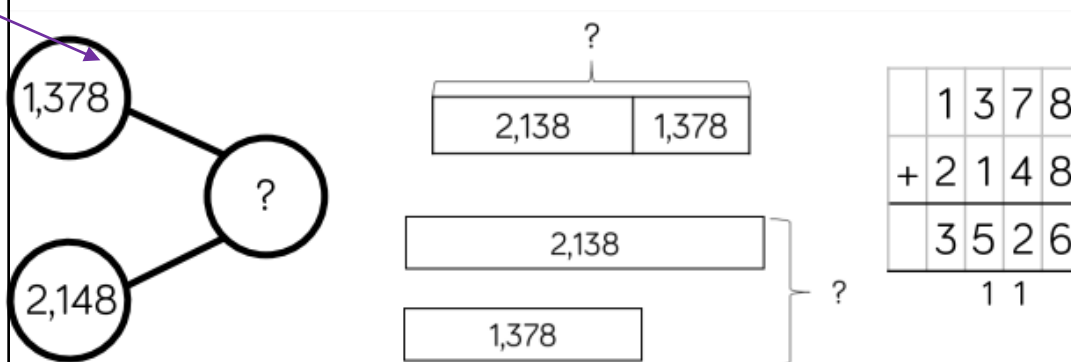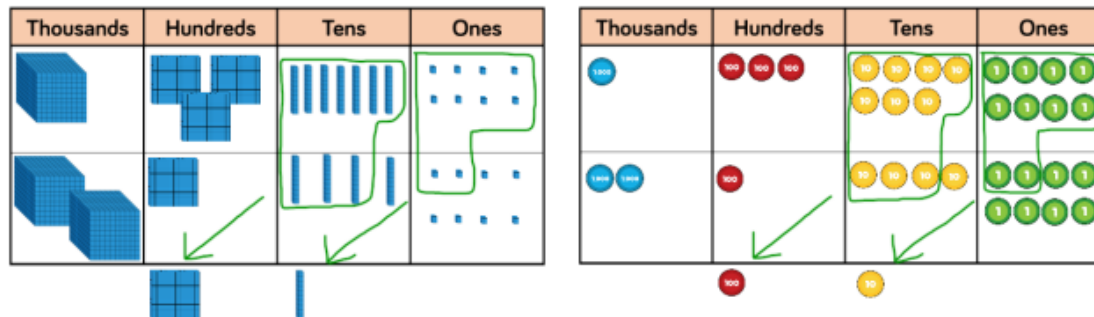Multiple bar models can be used to represent the difference in subtraction. An arrow can be used to model the difference.
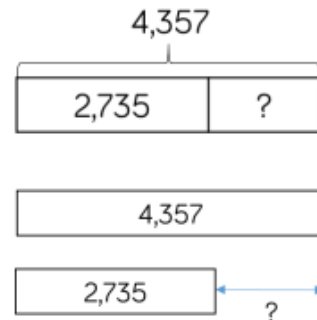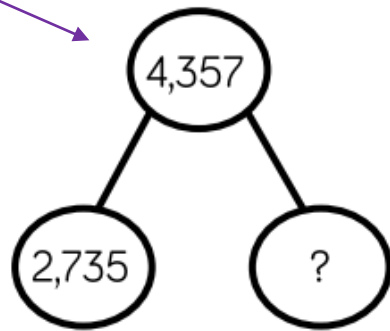
$$4,357 - 2,735 = 1,622$$

Pupils should first subtract without an exchange before moving on to subtraction with an exchange. Allow pupils to experience the exchange between columns.

Skill: subtract numbers with up to 4 digits

Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits.

Ensure pupils write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Number, Addition and Subtraction | NCETM

The Dean Trust Calculation Policy Year 5

Addition and Subtraction

Year 5 Addition and Subtraction

National Curriculum Objectives
- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- add and subtract numbers mentally with increasingly large numbers
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

When the parts are complete and the whole is empty, pupils use aggregation to add the parts together to find the total.

$$104,328 + 61,731 = 166,059$$

Pupils should first add without an exchange before moving on to addition with an exchange. Allow pupils to experience the exchange between columns.

HTh	TTh	Th	H	T	O

	1	0	4	3	2	8
+		6	1	7	3	1
	1	6	6	0	5	9
				1		

Skill: Add numbers with more than 4 digits

Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.

At this stage, pupils should be encouraged to work in the abstract, using the column method to add larger numbers efficiently

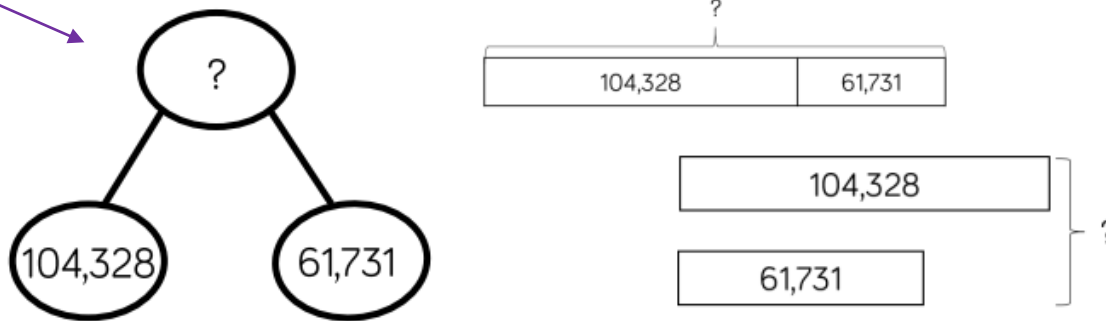Number, Addition and Subtraction | NCETM

Year 5 Addition and Subtraction
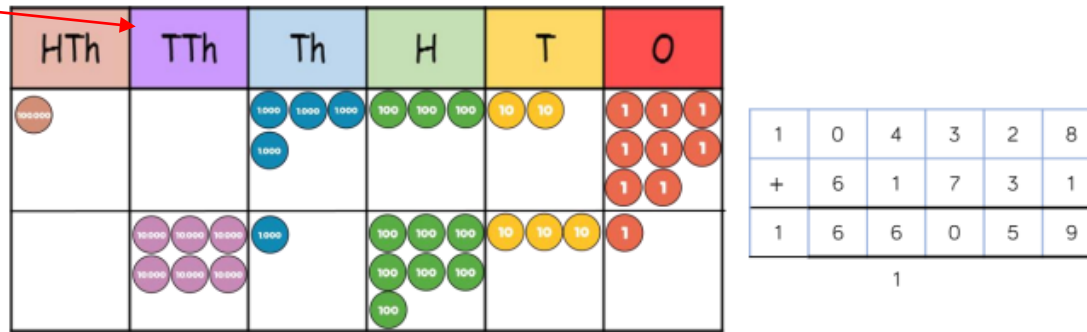
National Curriculum Objectives
- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- add and subtract numbers mentally with increasingly large numbers
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

When the parts are complete and the whole is empty, pupils use aggregation to add the parts together to find the total.

Pupils should first add without an exchange before moving on to addition with an exchange. Allow pupils to experience the exchange between columns.

$3.65 + 2.41 = 6.06$

Skill: Add numbers with up to 3 decimal places

Place value counters or plain counters on a place value grid are the most effective manipulatives when adding decimals with 1,2 and then 3 decimal places.

Ensure pupils have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other measures.

Number, Addition and Subtraction | NCETM

Year 5 Addition and Subtraction

National Curriculum Objectives
- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- add and subtract numbers mentally with increasingly large numbers
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

When the whole is complete and at least one of the parts is empty, pupils use partitioning to find the missing part. When building the model, pupils should just make the minuend using counters. Pupils should start with the smallest place value column. When there are not enough ones/tens/hundreds etc to subtract in a column, pupils need to move to the left and exchange. E.g. exchange 1 ten for 10 ones. They can then subtract efficiently.

$$294,382 - 182,501 = 111,881$$

Skill: Subtract numbers with more than 4 digits

Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits,
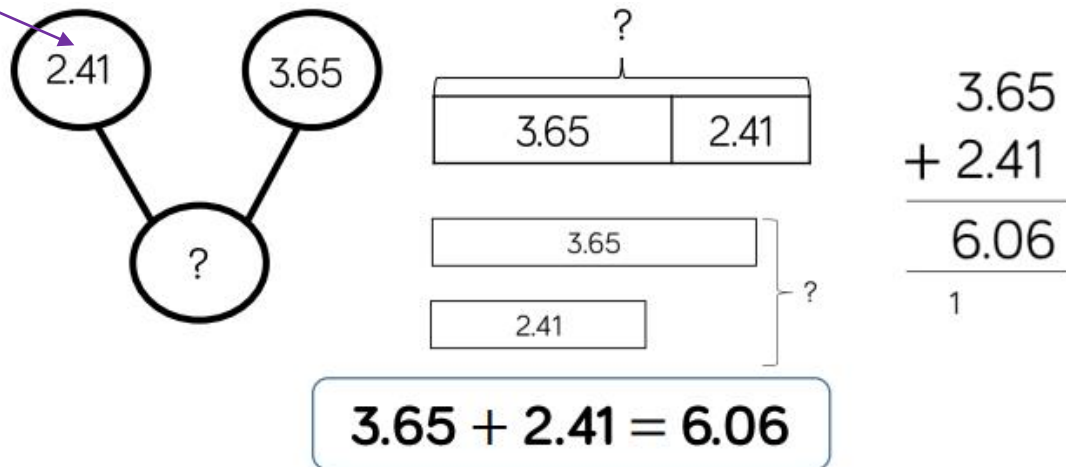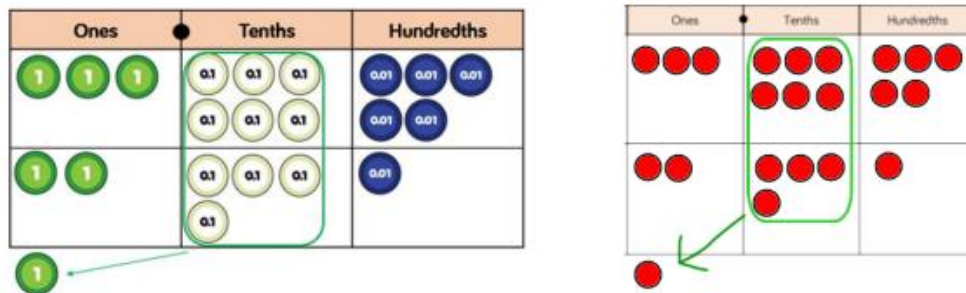
At this stage, pupils should be encouraged to work in the abstract, using the column method to subtract larger numbers efficiently

Number, Addition and Subtraction | NCETM

Year 5 Addition and Subtraction

National Curriculum Objectives
- add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
- add and subtract numbers mentally with increasingly large numbers
- use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why

When building the model, pupils should just make the minuend using counters. Pupils should start with the smallest place value column. When there are not enough tenths/hundredths/thousandths etc to subtract in a column, pupils need to move to the left and exchange. E.g. exchange 1 tenth for 10 hundredths. They can then subtract efficiently.

$$5.43 - 2.7 = 2.73$$

Skill: Subtract with up to 3 decimal places

Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2, and then 3 decimal places.

Ensure pupils have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures.
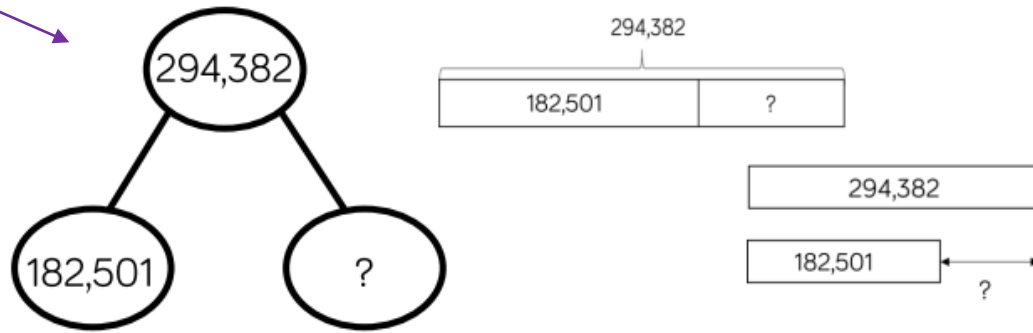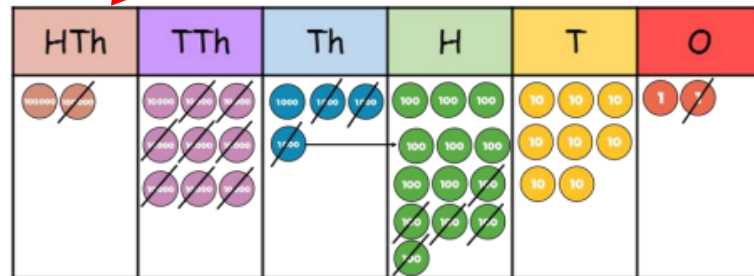
Number, Addition and Subtraction | NCETM

The Dean Trust Calculation Policy Year 6

Addition and Subtraction

Year 6 Addition and Subtraction

National Curriculum Objectives
- use their knowledge of the order of operations to carry out calculations involving the 4 operations
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

When the parts are complete and the whole is empty, pupils use aggregation to add the parts together to find the total.

Pupils should first add without an exchange before moving on to addition with an exchange. Allow pupils to experience the exchange between columns.

$$104,328 + 61,731 = 166,059$$

Skill: Add numbers with more than 4 digits

Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.
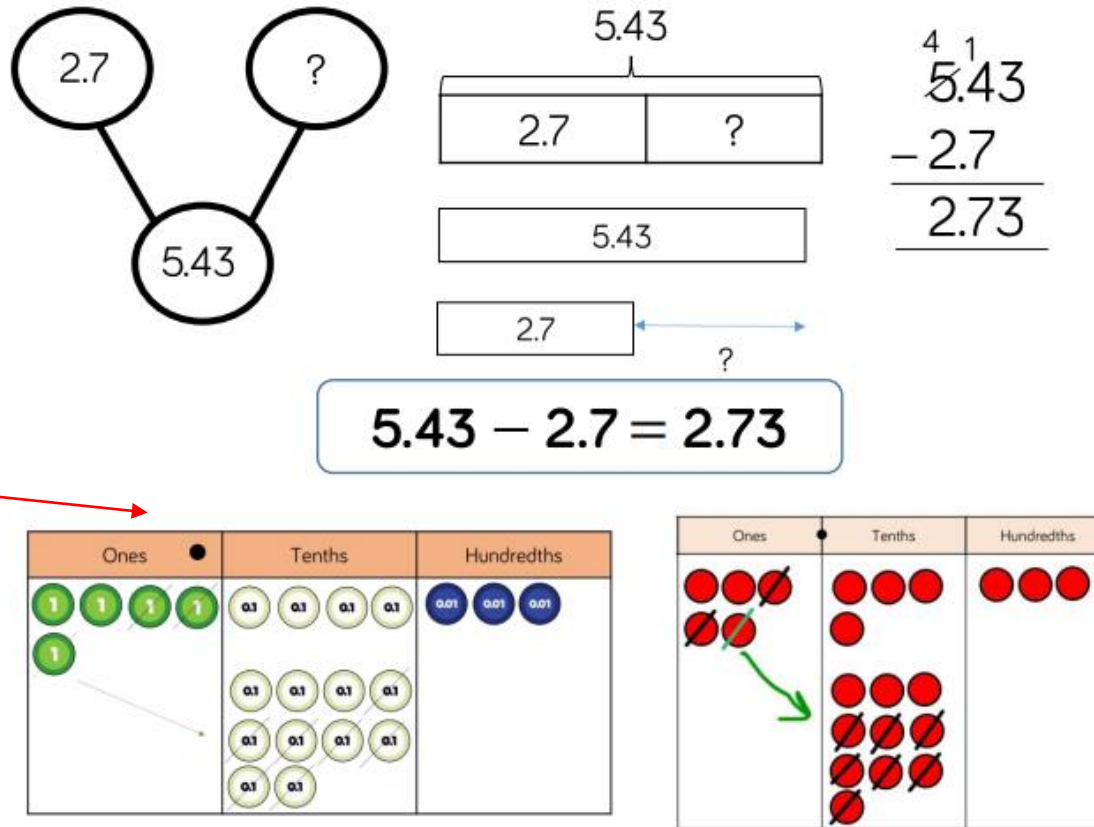
At this stage, pupils should be encouraged to work in the abstract, using the column method to add larger numbers efficiently

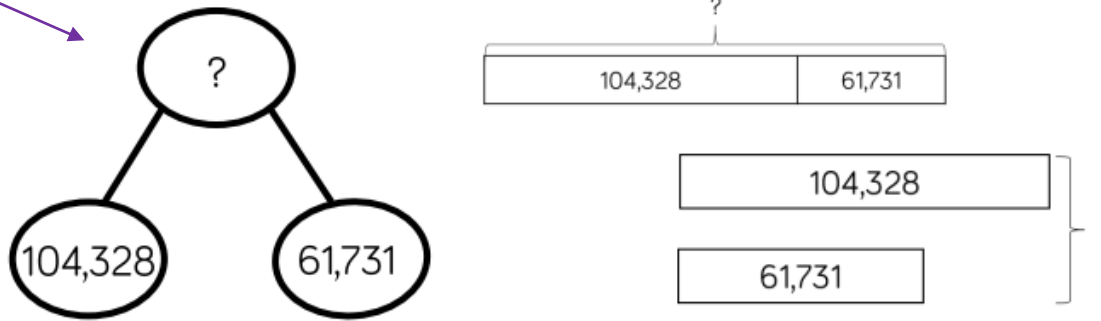Number, Addition and Subtraction | NCETM

Year 6 Addition and Subtraction
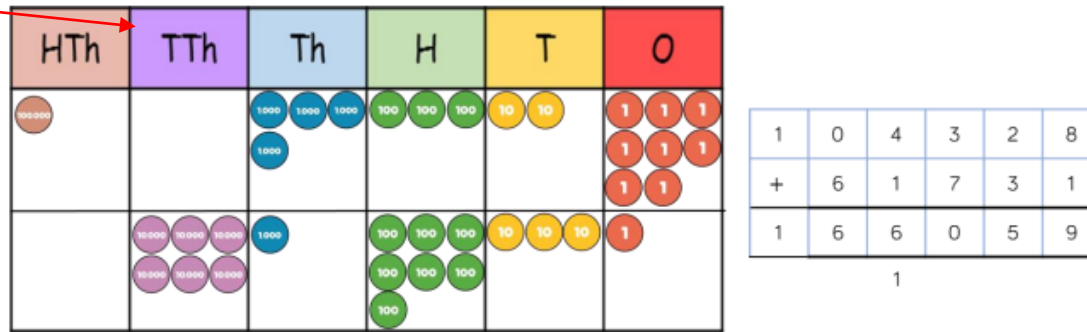
National Curriculum Objectives
- use their knowledge of the order of operations to carry out calculations involving the 4 operations
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy

When the whole is complete and at least one of the parts is empty, pupils use partitioning to find the missing part. When building the model, pupils should just make the minuend using counters. Pupils should start with the smallest place value column. When there are not enough ones/tens/hundreds etc to subtract in a column, pupils need to move to the left and exchange. E.g. exchange 1 ten for 10 ones. They can then subtract efficiently.

$$294,382 - 182,501 = 111,881$$

Skill: Subtract numbers with more than 4 digits

Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits,

At this stage, pupils should be encouraged to work in the abstract, using the column method to subtract larger numbers efficiently
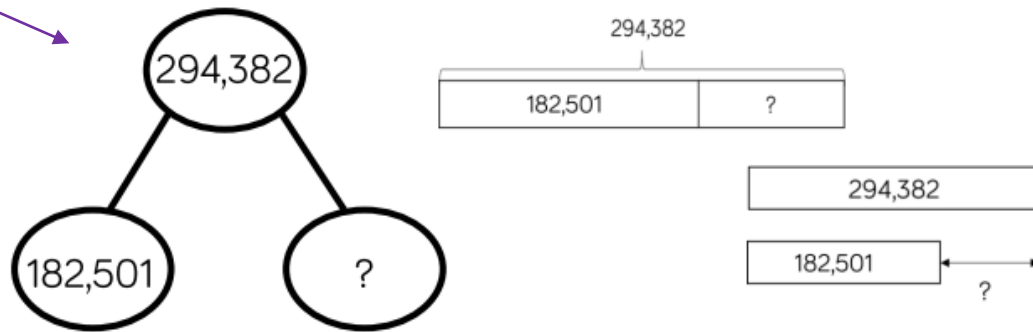
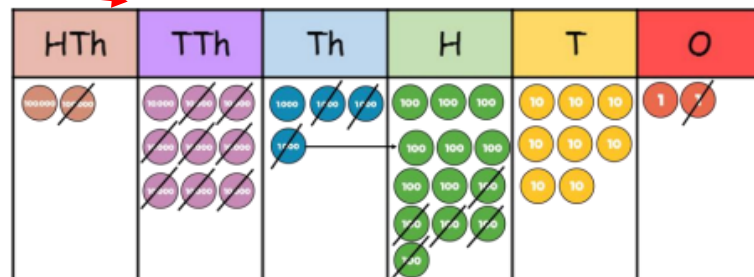Number, Addition and Subtraction | NCETM

Addition and Subtraction Key Vocab

Addend	A number to be added to another
Aggregation	Combining two or more quantities or measures to find a total
Augmentation	Increasing a quantity or measure by another quantity
Commutative	Numbers can be added in any order
Complement	In addition, a number and its complement make a total e.g. 300 is the complement to 700 to make 1,000.
Difference	The numerical difference between two numbers is found by comparing the quantity in each group.
Exchange	Change a number or expression for another of an equal value
Minuend	A quantity or number from which another subtracted
Partitioning	Splitting a number into its component
reduction	Subtraction as take away
subitise	Instantly recognise the number of objects in a small group without needing to count.
subtrahend	A number to be subtracted from another
sum	The result of an addition
total	The aggregate or the sum found by addition

The Dean Trust Calculation Policy EYFS

Multiplication and Division

EYFS Multiplication and Division

Building numbers using the pair-wise patterns on 10 frames helps the children to see the doubles

Number shapes can be used to match and see the double.

Allow the children to explore different ways to build doubles using real objects and practical equipment.
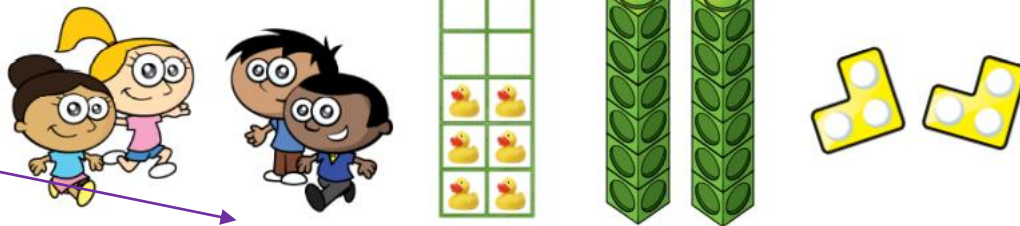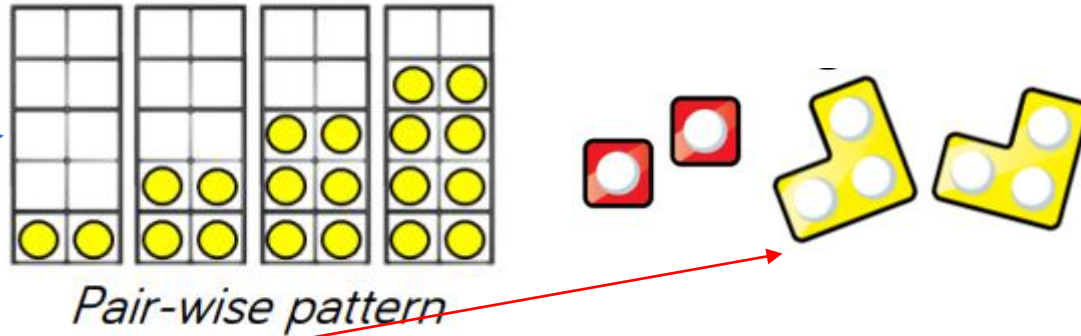
Pair-wise pattern

Skill: Doubling

The children will learn that double means 'twice as many'. They should be given opportunities to build doubles using real objects and mathematical equipment.

Building numbers using the pair wise patterns on 10 frames helps the children to see the doubles.

Provide examples of doubles and non-doubles for the children to sort and explain why.

Early Years | NCETM

EYFS Multiplication and Division

The children begin to understand that some quantities will share equally into 2 groups and some won't. They may also notice that some quantities can be grouped into pairs and some will have one left over. Provide opportunities for them to explore these ideas in different contexts as they play and to talk about what they notice.
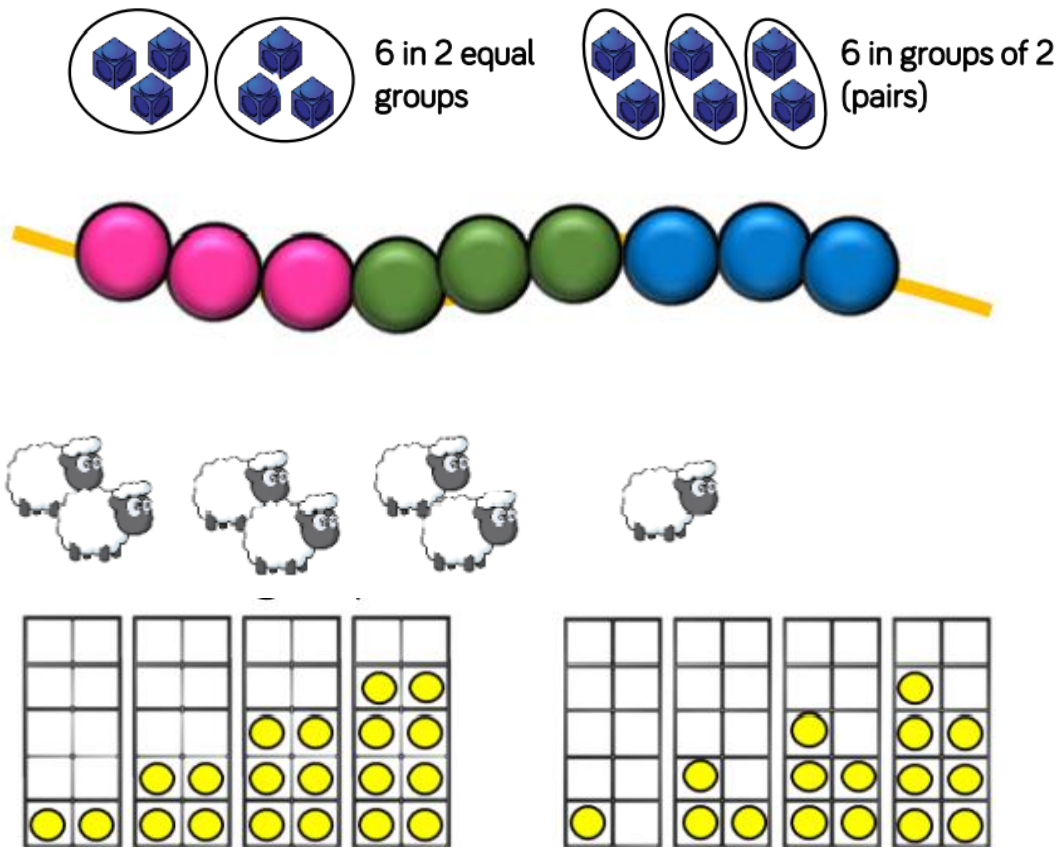
Skill: Sharing and grouping

The children should also be given opportunities to recognise and make equal groups.

The children will notice that sometimes there are items left over when they share or group.

Provide opportunities for the children to share items equally.

Early Years | NCETM

The Dean Trust Calculation Policy Year 1

Multiplication and Division

Year 1 Multiplication and division

National Curriculum Objectives
• solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

Number shapes support pupils' understanding of multiplication as repeated addition.

Bead strings to 100 can support pupils in their understanding of multiplication as repeated addition. When dividing, pupils can build the number they are dividing and then group the beads into the number they are dividing by.

When dividing support pupils' understanding of division as grouping.

One bag holds 5 apples.
How many apples do 4 bags hold?

$5 + 5 + 5 + 5 = 20$

Skill: Solve 1-step problems using multiplication

When Pupils represent multiplication as repeated addition in many different ways.

Pupils use concrete and pictorial representations to solve problems. Pupils are not expected to record multiplication formally.

Multiplication and Division | NCETM
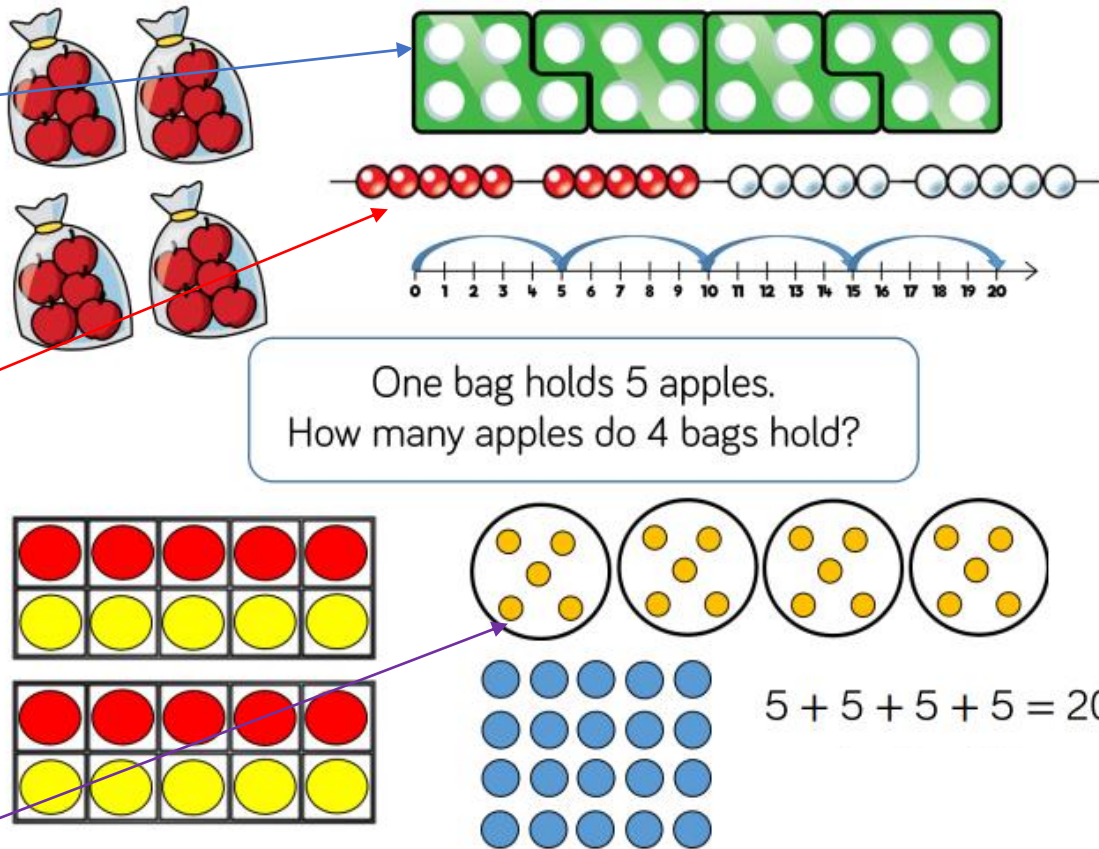
Year 1 Multiplication and division

National Curriculum Objectives
• solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.

Number shapes support pupils' understanding of .

When dividing, pupils can build the number they are dividing and then group the beads into the number they are dividing by.

When dividing support pupils' understanding of division as grouping.

There are 20 apples altogether.
They are put in bags of 5.
How many bags are there?

Skill: Solve 1-step problems using division

Pupils solve problems by grouping and counting the number of groups.

Grouping encourages pupils to count in multiples and links to repeated subtraction on a number line.

Pupils can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.

Multiplication and Division | NCETM

The Dean Trust Calculation Policy Year 2

Multiplication and Division

Year 2 Multiplication and division

National Curriculum Objectives
- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Number shapes support pupils' understanding of multiplication as repeated addition.

When dividing, number shapes support pupils' understanding of division as grouping.

Encourage daily counting in multiples both forwards and backwards. Notice all the numbers are even.
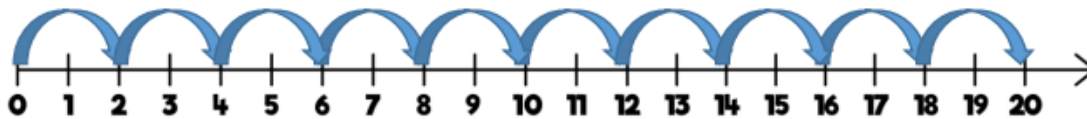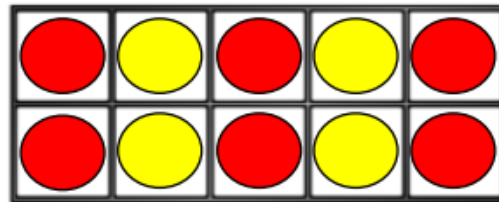
Skill: 2 times table

Count in multiples of 2 forwards and backwards. Use a number line or 100 square.

Look for patterns in the two times table, using concrete manipulatives to support.

Use different models to develop fluency.

Multiplication and Division | NCETM
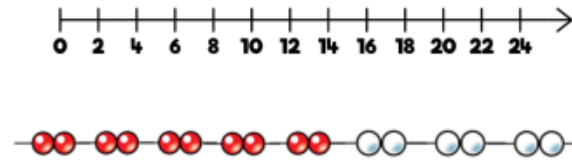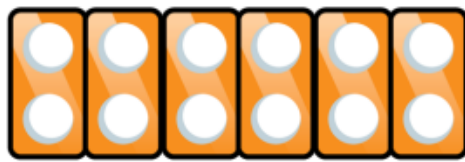
Year 2 Multiplication and division

National Curriculum Objectives
- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Number shapes support pupils' understanding of multiplication as repeated addition.

When dividing, number shapes support pupils' understanding of division as grouping.

Encourage daily counting in multiples both forwards and backwards. Notice and discuss the patterns.

Skill: 5 times table

Count in multiples of 5 forwards and backwards. Use a number line or 100 square.

Look for patterns in the five times table, using concrete manipulatives to support. Highlight the odd, even, odd, even pattern.

Multiplication and Division | NCETM

Year 2 Multiplication and division

National Curriculum Objectives
- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Number shapes support pupils' understanding of multiplication as repeated addition.

Use resources that link Maths to real life.

Encourage daily counting in multiples both forwards and backwards.
Notice and discuss the patterns.

Skill: 10 times table

Count in multiples of 10 forwards and backwards. Use a number line or 100 square.

Look for patterns in the ten times table, using concrete manipulatives to support. Highlight the pattern in the digits- the ones are always 0, and the tens increase by 1 ten each time.

Multiplication and Division | NCETM

Year 2 Multiplication and division

National Curriculum Objectives
- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts
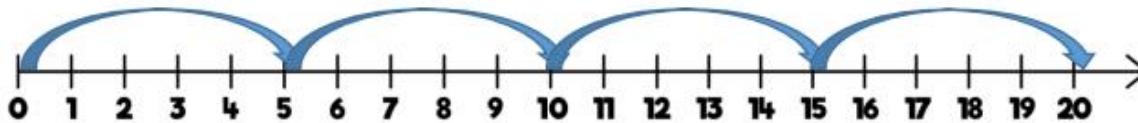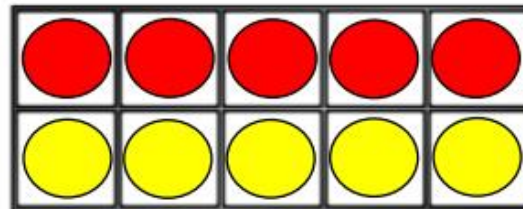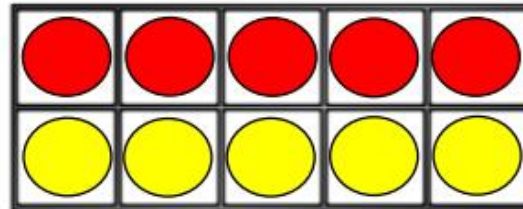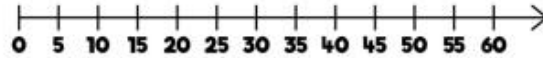
Number shapes support pupils' understanding of multiplication as repeated addition.

Number tracks are useful to support pupils to count in multiples, forwards and backwards. Moving counters or cubes along the track can support pupils to keep track of their counting.

Pupils can record how many jumps they have made to find the answer to the division.

One bag holds 5 apples.
How many apples do 4 bags hold?

$5 + 5 + 5 + 5 = 20$

$4 \times 5 = 20$

$5 \times 4 = 20$

Skill: Solve 1-step problems using multiplication

When Pupils represent multiplication as repeated addition in many different ways.

Pupils use concrete and pictorial representations to solve problems.

Pupils are introduced to the multiplication symbol.

Multiplication and Division | NCETM
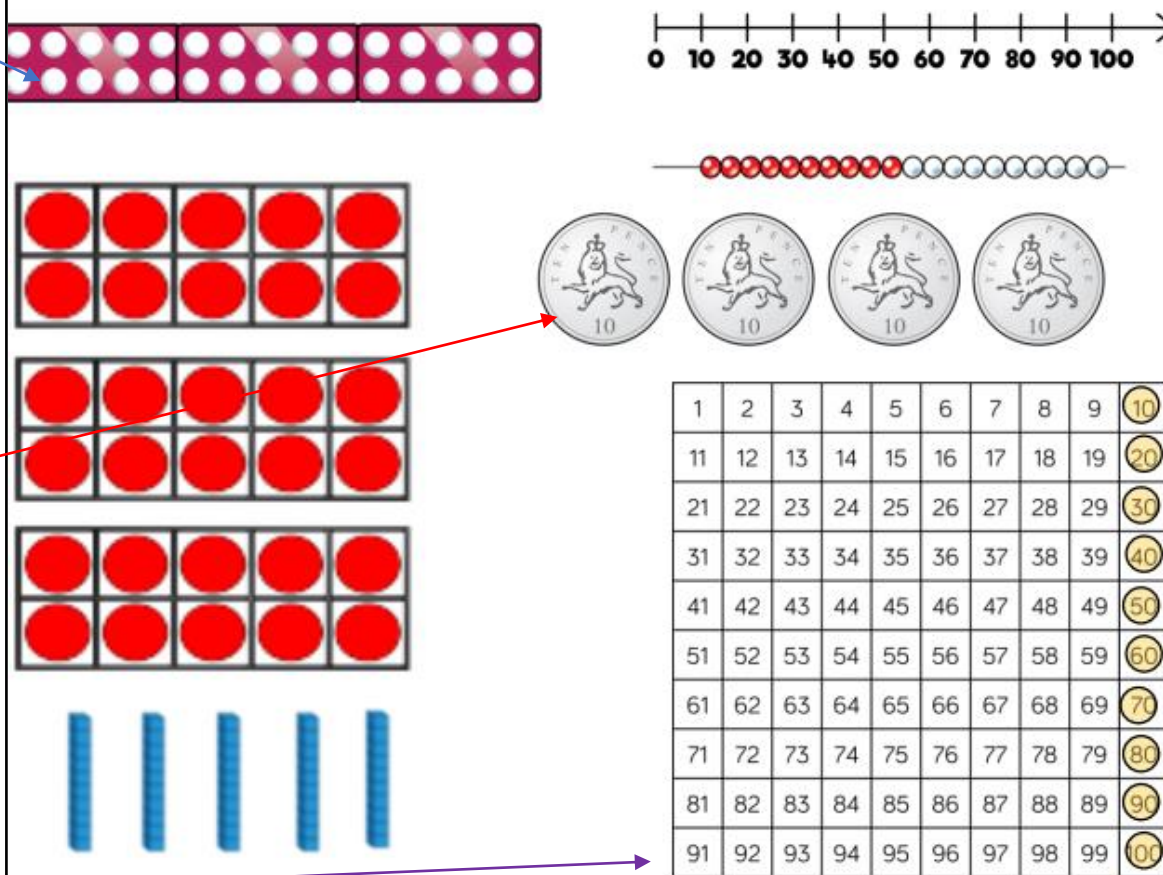
Year 2 Multiplication and division

National Curriculum Objectives
- recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers
- calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs
- show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot
- solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Number shapes support pupils' understanding of .

When dividing, pupils can build the number they are dividing and then group the beads into the number they are dividing by.

When dividing support pupils' understanding of division as grouping.

There are 20 apples altogether.
They are put in bags of 5.
How many bags are there?

$20 \div 5 = 4$

Skill: Solve 1-step problems using division

Pupils solve problems by grouping and counting the number of groups.

Grouping encourages pupils to count in multiples and links to repeated subtraction on a number line.

Pupils can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.

Multiplication and Division | NCETM

The Dean Trust Calculation Policy Year 3

Multiplication and Division

Year 3 Multiplication and division

National Curriculum Objectives
- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

Number shapes support pupils' understanding of multiplication as repeated addition.

Encourage daily counting in multiples both forwards and backwards.
Notice and discuss the patterns.

Skill: 3 times table

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or hundred square.

Look for patterns in the three times table, using concrete manipulatives to support. Notice the odd, even, odd, even pattern using number shapes to support. Highlight the pattern in ones using a hundred square.
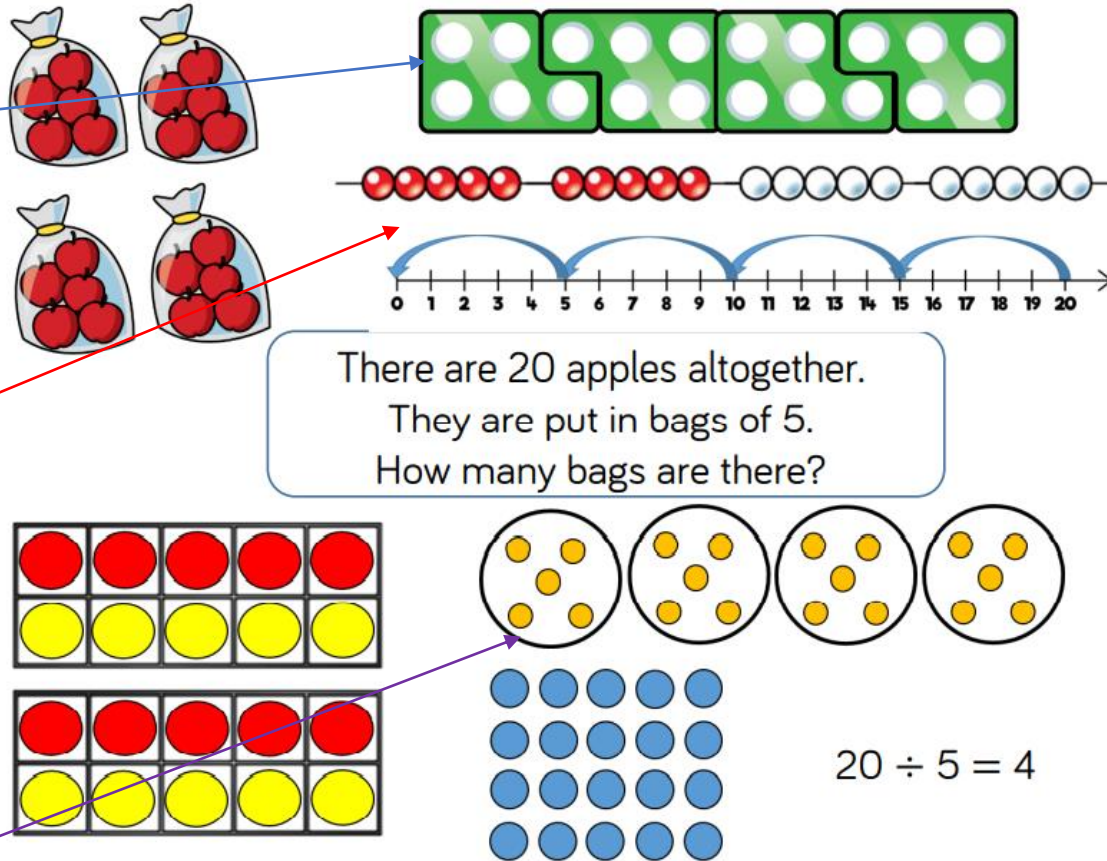
Multiplication and Division | NCETM

Year 3 Multiplication and division

National Curriculum Objectives
- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

Number shapes support pupils' understanding of multiplication as repeated addition.

Encourage daily counting in multiples both forwards and backwards. Notice and discuss the patterns.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50

4	8	12	16	20
24	28	32	36	40
44	48	52	56	60

4   8   12   16

0 4 8 12 16 20 24 28 32 36 40 44 48
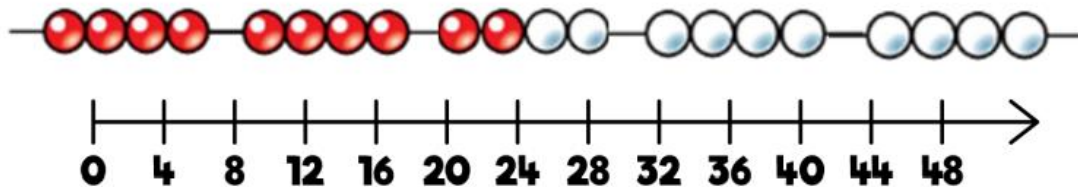
Skill: 4 times table

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or hundred square.

Look for patterns in the four times table, using concrete manipulatives to support. Make links to the 2 times table, seeing how each multiple is double the twos. Notice the pattern in the ones within each group of five multiples. Highlight that all multiples are even using number shapes to support.
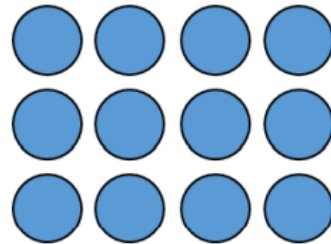
Multiplication and Division | NCETM

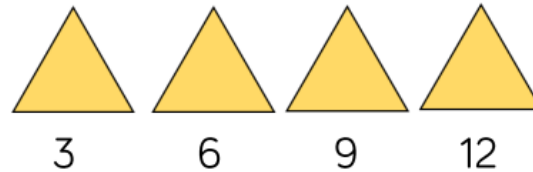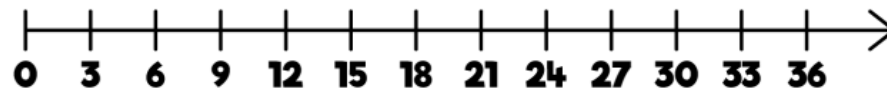# Year 3 Multiplication and division
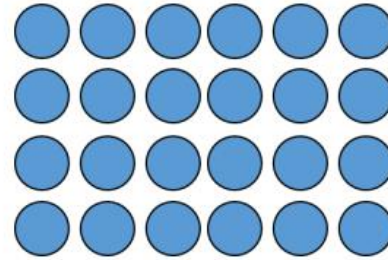
National Curriculum Objectives
- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

Number shapes support pupils' understanding of multiplication as repeated addition.

Encourage daily counting in multiples both forwards and backwards. Notice and discuss the patterns.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

8   16   24   32

8	16	24	32	40
48	56	64	72	80
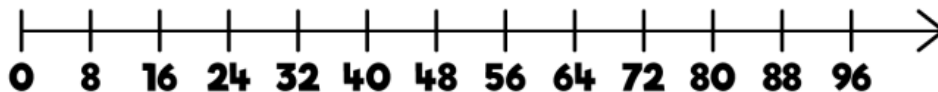
0 8 16 24 32 40 48 56 64 72 80 88 96

Skill: 8 times table

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or hundred square.

Look for patterns in the eight times table, using concrete manipulatives to support. Make links to the 4 times table, seeing how each multiple is double the fours. Notice the pattern in the ones within each group of five multiples. Highlight that all multiples are even using number shapes to support.
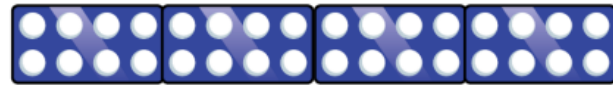
Multiplication and Division | NCETM

Year 3 Multiplication and division

National Curriculum Objectives
* recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
* write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
* solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

Using Base 10 is an effective way to support pupil's understanding of column multiplication. It is important that pupils write out their calculation alongside the equipment so they can see how the concrete and written representations match.

$$34 \times 5 = 170$$

Skill: Multiply 2-digit numbers by 1-digit numbers

Informal methods and the expanded method are used in Year 3.

Place value counters should be used to support the understanding of the method rather than supporting the multiplication, as pupils should use time stable knowledge.

[Multiplication and Division | NCETM](#)

Year 3 Multiplication and division

National Curriculum Objectives
- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

Pupils can use place value counters to share between groups. Start by sharing the larger place value column and work from left to right.

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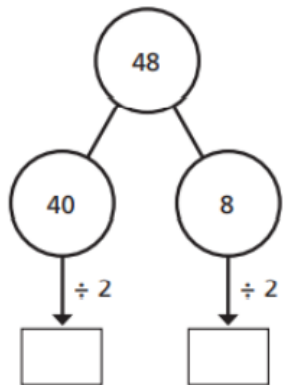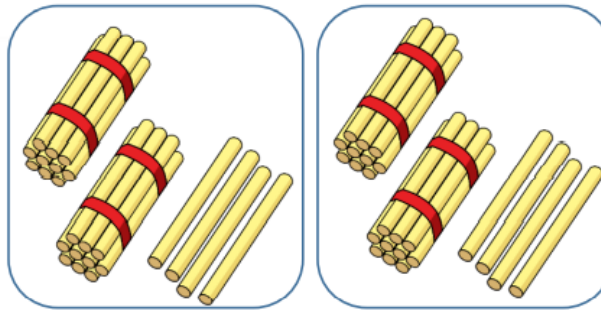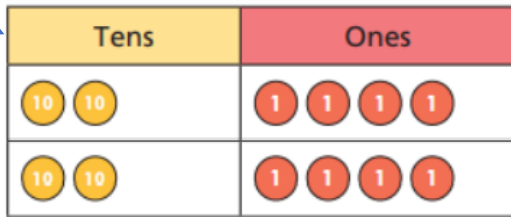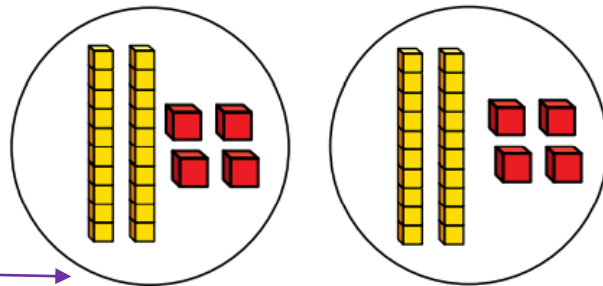
Pupils can share Base 10 between different groups

Tens	Ones
10 10	1 1 1 1
10 10	1 1 1 1

48
40   8
÷ 2   ÷ 2

$48 \div 2 = 24$

Skill: Divide 2-digit numbers by 1-digit numbers (sharing with no exchange)

When dividing larger numbers, pupils can use manipulatives that allow them to partition into tens and ones.

Straws, Base 10 and place value counters can all be used to share numbers into equal groups.

Part-whole models can provide pupils with a clear written method that matches the concrete representation.

Multiplication and Division | NCETM

Year 3 Multiplication and division

National Curriculum Objectives
- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

When sharing start with the larger place value and work from left to right.
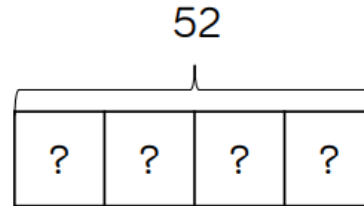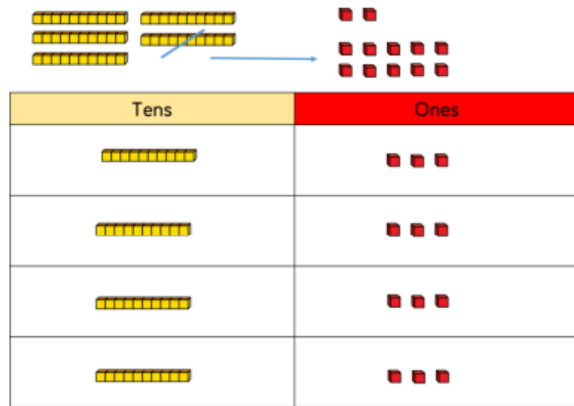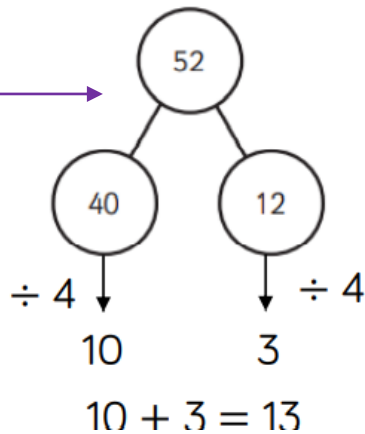
When recording encourage children to use the part-whole model so they can consider how the number has been partitioned in order to divide. This will support mental methods.

$$52 \div 4 = 13$$

$$10 + 3 = 13$$

Skill: Divide 2-digit numbers by 1-digit numbers (sharing with exchange)

When dividing numbers involving an exchange, pupils can use Base 10 and place value counters to exchange one ten for ten ones.

Pupils should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows.

Flexible partitioning in a part-whole model supports this method.
Multiplication and Division | NCETM

The Dean Trust Calculation Policy Year 4

Multiplication and Division

Year 4 Multiplication and division

National Curriculum Objectives
- recall multiplication and division facts for multiplication tables up to 12 × 12
- use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers
- recognise and use factor pairs and commutativity in mental calculations
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects

Number shapes support pupils' understanding of multiplication as repeated addition.

Encourage daily counting in multiples both forwards and backwards. Notice and discuss the patterns.

6	12	18	24	30
36	42	48	54	60
66	72	78	84	90

Skill: 6 times table

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or hundred square.

Look for patterns in the six times table, using concrete manipulatives to support. Make links to the 3 times table, seeing how each multiple is double the fours. Notice the pattern in the ones within each group of five multiples. Highlight that all multiples are even using number shapes to support.

Multiplication and Division | NCETM

Year 4 Multiplication and division

National Curriculum Objectives
- recall multiplication and division facts for multiplication tables up to 12 × 12
- use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers
- recognise and use factor pairs and commutativity in mental calculations
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects

Number shapes support pupils' understanding of multiplication as repeated addition.

Encourage daily counting in multiples both forwards and backwards. Use a number square to notice and discuss the patterns.

9	18	27	36	45
54	63	72	81	90

Skill: 9 times table

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or hundred square.

Look for patterns in the nine times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using a number square to support as well as noting the odd, even pattern within the multiples.
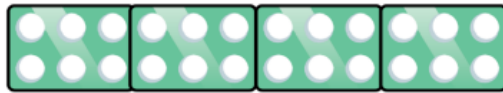
Multiplication and Division | NCETM
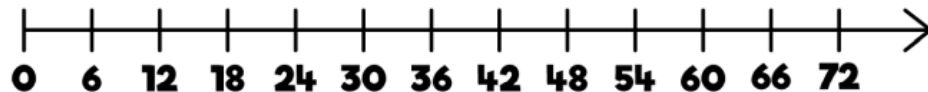
Year 4 Multiplication and division

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Number shapes support pupils' understanding of multiplication as repeated addition.

Encourage daily counting in multiples both forwards and backwards. Notice and discuss the patterns.

7	14	21	28	35
42	49	56	63	70

Skill: 7 times table

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or hundred square.

The seven times table can be trickier to learn due to the lack of obvious pattern in the numbers, however pupils already know several facts due to commutativity. Pupils can still see the odd, even pattern in the multiples using number shapes to support.

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Year 4 Multiplication and division

National Curriculum Objectives
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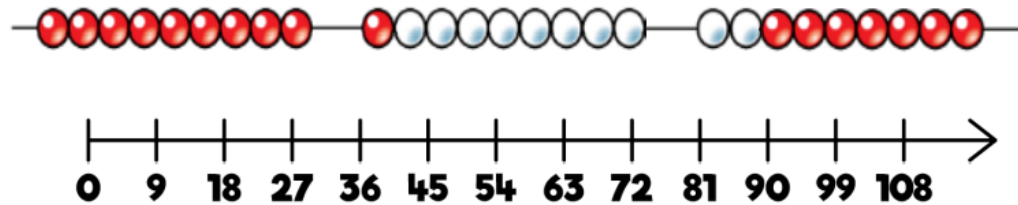
Use counters to look at the patterns in the tens and ones.

Encourage daily counting in multiples both forwards and backwards. Notice and discuss the patterns in the tens and ones.

Skill: 11 times table

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or hundred square.

Look for patterns in the eleven times table, using concrete manipulatives to support. Notice the patterns in the tens and ones using a hundred square to support. Also consider the pattern after crossing 100.

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Year 4 Multiplication and division

National Curriculum Objectives
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- use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers
- recognise and use factor pairs and commutativity in mental calculations
- multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects
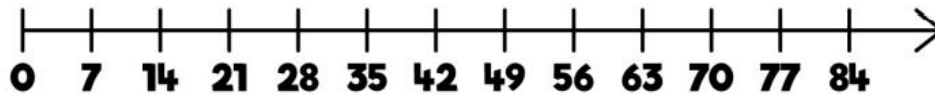
Use counters to look at the patterns in the ones.

Encourage daily counting in multiples both forwards and backwards. Notice and discuss the patterns in the ones.

12	24	36	48	60
72	84	96	108	120
132	144			

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

0 12 24 36 48 60 72 84 96 108 120 132 144

Skill: 12 times table

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or hundred square.
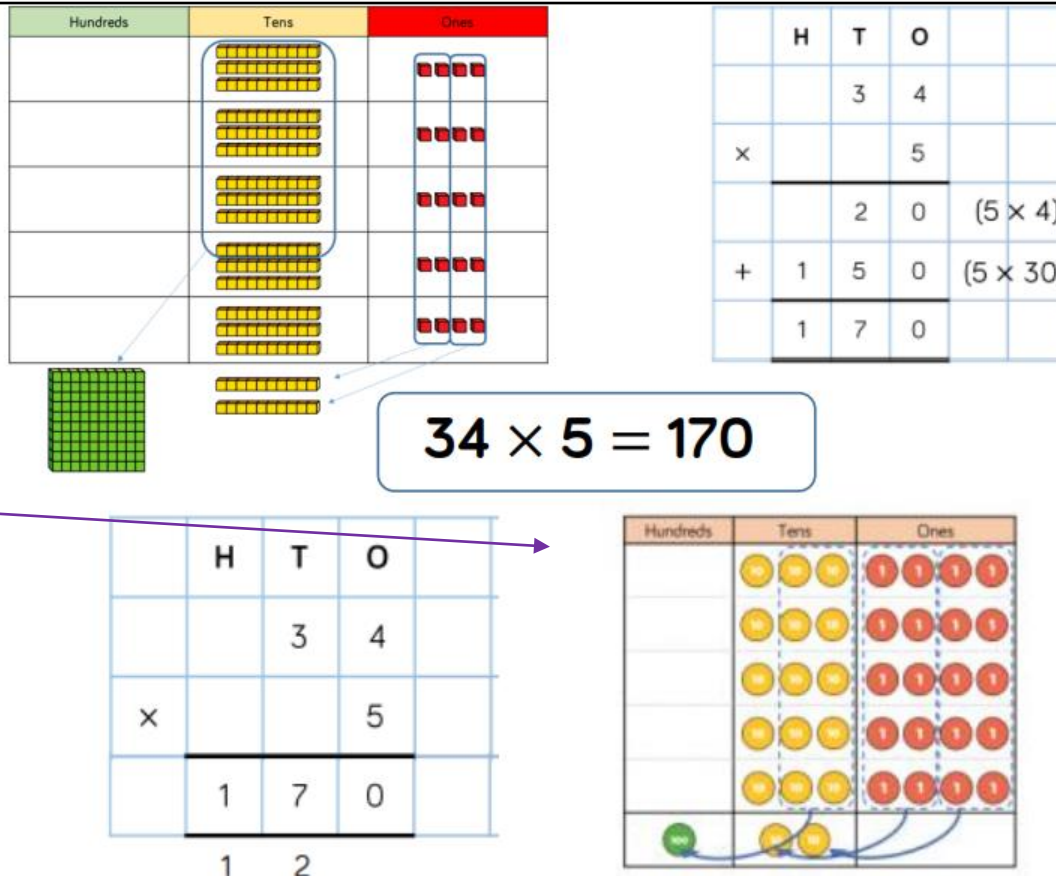
Look for patterns in the 12 times table, using concrete manipulatives to support. Make links to the 6 times table, seeing how each multiple is double the sixes. Notice the patterns in the ones within each group of five multiples. The hundred square can support in highlighting this pattern.

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Year 4 Multiplication and division

National Curriculum Objectives
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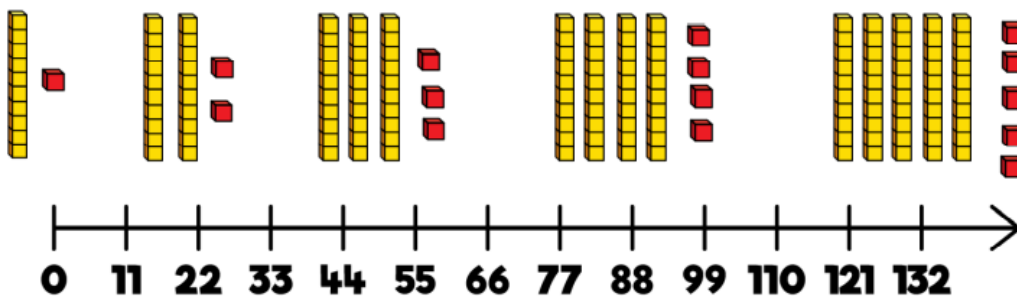
Using place value counters and base 10 is an effective way to support children's understanding of column multiplication. It is important that children write out the calculation alongside the equipment so they can see how the concrete and written match.

$$34 \times 5 = 170$$

Skill: Multiply 2-digit numbers by 1-digit numbers

Informal methods and the expanded method are used in Year 3 moving onto short multiplication in year 4.

Place value counters should be used to support the understanding of the method rather than supporting the multiplication, as pupils should use time stable knowledge.

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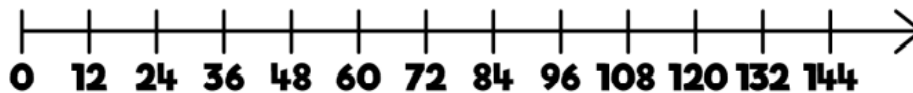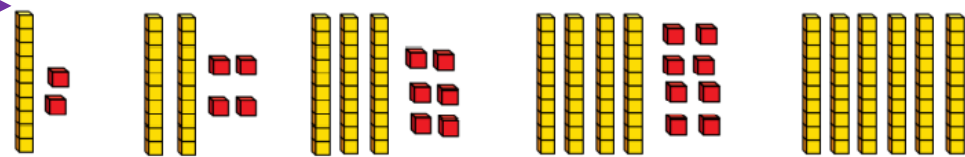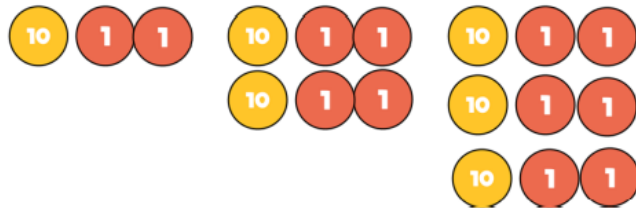
Year 4 Multiplication and division

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- recall multiplication and division facts for multiplication tables up to 12 × 12
- use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers
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- multiply two-digit and three-digit numbers by a one-digit number using formal written layout
- solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects

As numbers become larger in multiplication or the amount of groups becomes higher, Base 10 becomes less efficient due to the amount of exchanges needed. The use of counters is more efficient and helps children to understand the written method.

$$245 \times 4 = 980$$
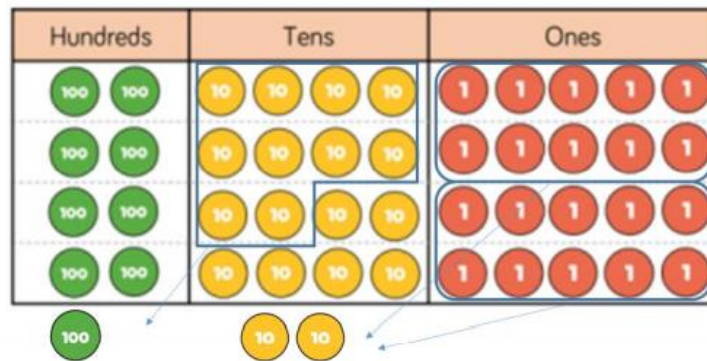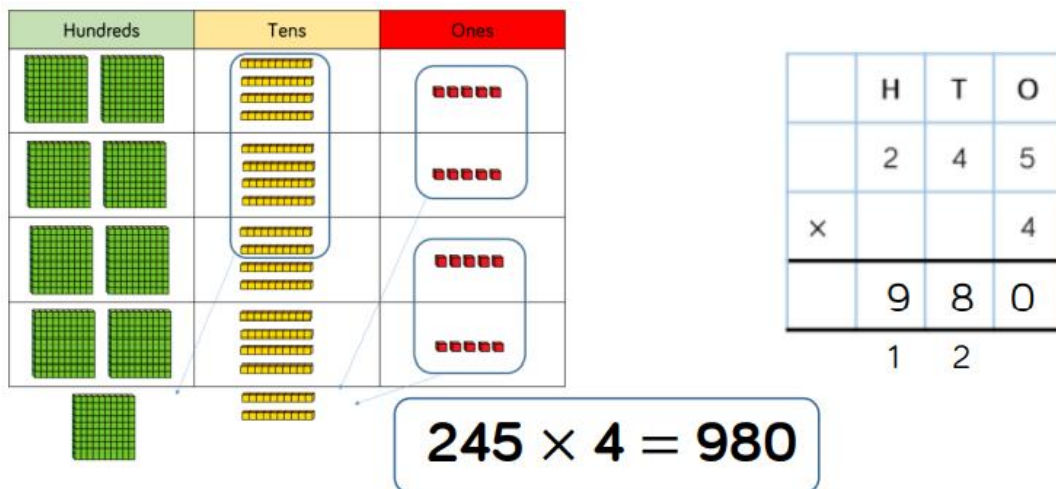
Skill: Multiply 3-digit numbers by 1-digit numbers

When moving to 3-digit by 1-digit multiplication, encourage pupils to move towards the short, formal method.

Base 10 and place value counters continue to support the understanding of the written method.

Limit the number of exchanges needed in the questions and move pupils away from resources when multiplying larger numbers.

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National Curriculum Objectives
recall multiplication and division facts for multiplication tables up to 12 × 12
use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together 3 numbers
recognise and use factor pairs and commutativity in mental calculations
multiply two-digit and three-digit numbers by a one-digit number using formal written layout
solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by 1 digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects

Division can be represented by showing the total of the bar model and then dividing the bar model into equal groups.

When recording encourage children to use the part-whole model so they can consider how the number has been partitioned in order to divide. This will support mental methods.

$$52 \div 4 = 13$$

$$10 + 3 = 13$$

Skill: Divide 2-digit numbers by 1-digit numbers (sharing with exchange)

When dividing numbers involving an exchange, pupils can use Base 10 and place value counters to exchange one ten for ten ones.

Pupils should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows.

Flexible partitioning in a part-whole model supports this method.

Multiplication and Division | NCETM

The Dean Trust Calculation Policy Year 5

Multiplication and Division

Year 5 Multiplication and division

National Curriculum Objectives
- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
- know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers
- establish whether a number up to 100 is prime and recall prime numbers up to 19
- multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers
- multiply and divide numbers mentally drawing upon known facts
- divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context
- multiply and divide whole numbers and those involving decimals by 10, 100 and 1000
- recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3)
- solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes
- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Using place value counters and base 10 is an effective way to support children's understanding of column multiplication. It is important that children write out the calculation alongside the equipment so they can see how the concrete and written match.

$$1,826 \times 3 = 5,478$$

	Th	H	T	O
	1	8	2	6
×				3
	5	4	7	8
	2		1	

Skill: Multiply 4-digit numbers by 1-digit numbers

When multiplying 4-digit numbers, place value counters are the best manipulative to use to support pupils in their understanding of the formal written method.

If pupils are multiplying larger numbers and struggling with their times tables, encourage the use of multiplication grids so pupils can focus on the use of the written method.

Multiplication and Division | NCETM

Year 5 Multiplication and division

National Curriculum Objectives
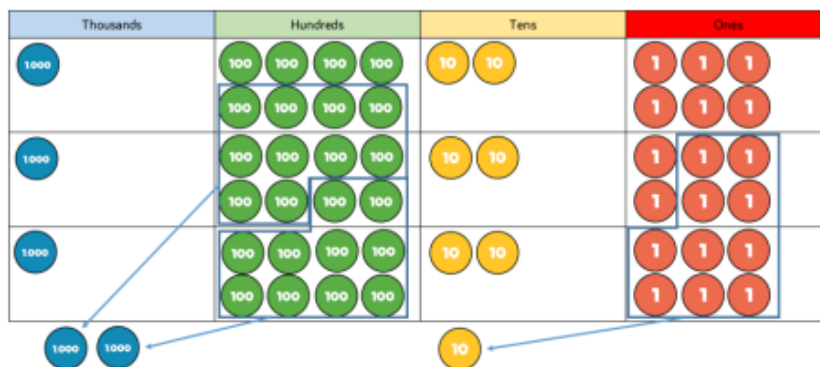- identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers
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- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Use base 10 to support the use of the area model of multiplication. Children use the equipment to build the number in a rectangular shape which they then find the area of by calculating the total value of the pieces. The area model can be linked to the grid method and the formal column method.

×	20	2
30	600	60
1	20	2

	H	T	O
		2	2
×		3	1
		2	2
	6	6	0
	6	8	2

$$22 \times 31 = 682$$

Skill: Multiply 2-digit numbers by 2-digit numbers

When multiplying a multi-digit number by 2-digits, use the area model to help pupils understand the size of the numbers they are using. This links to finding the area of a rectangle by finding the space covered by Base 10.

The grid method matches the area model as an initial written method before moving on to the formal written multiplication method
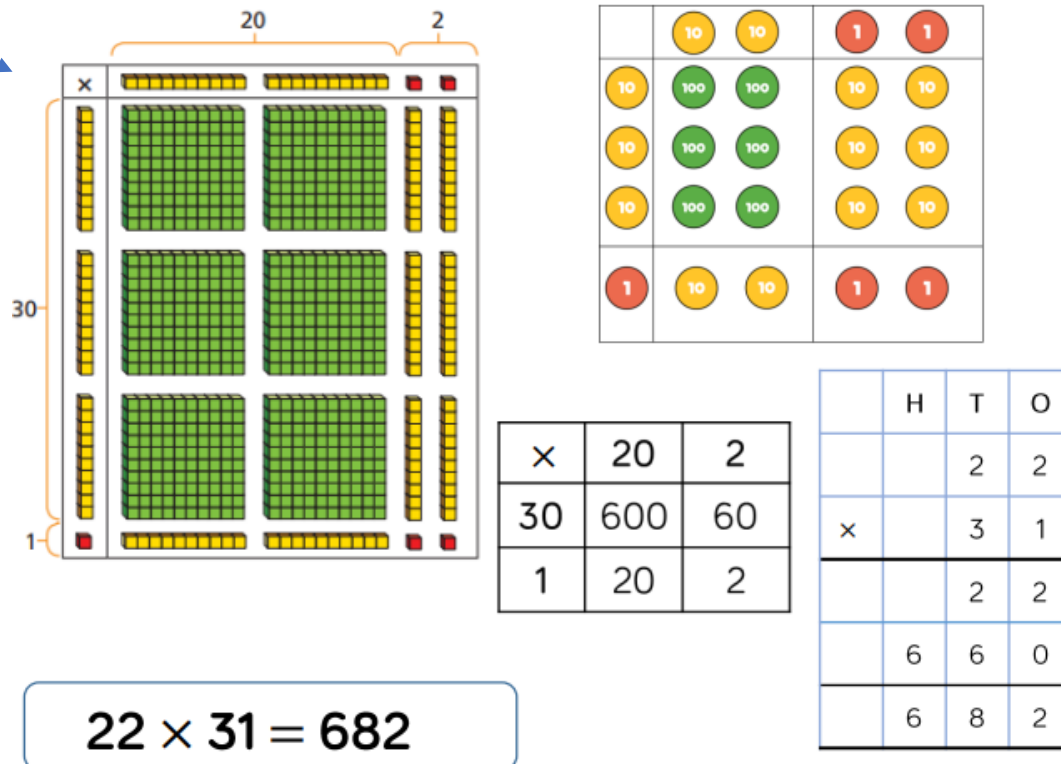Multiplication and Division | NCETM

Year 5 Multiplication and division

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- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Using place value counters and base 10 is an effective way to support children's understanding of column multiplication. It is important that children write out the calculation alongside the equipment so they can see how the concrete and written match.

Counters should be used to support the understanding of the written method rather than support the arithmetic.
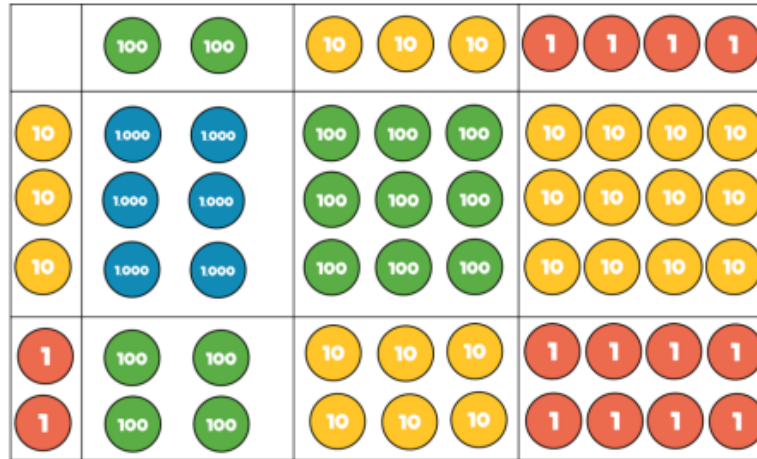
	Th	H	T	O
		2	3	4
×			3	2
		4	6	8
	₁7	₁0	2	0
	7	4	8	8

×	200	30	4
30	6,000	900	120
2	400	60	8

$234 \times 32 = 7{,}488$

Skill: Multiply 3-digit numbers by 2-digit numbers

Pupils can continue to use the area model when multiplying 3- digits by 2-digits. Place value counters become more efficient to use but Base 10 can be used to highlight the size of the numbers.

Encourage pupils to move towards the formal written method, seeing the links with the grid method.

Multiplication and Division | NCETM

Year 5 Multiplication and division

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- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Children will move on from the area model and work towards more formal multiplication methods.
They will start by exploring the role of the zero in the column method and understand its importance.
Children should understand what is happening within each step of the calculation process.

TTh	Th	H	T	O
	2	7	3	9
×			2	8
2 2	1 5	9 3	1 7	2
5 1	4	7 1	8	0
7	6	6	9	2
			1	

$$2{,}739 \times 28 = 76{,}692$$

Skill: Multiply 4-digit numbers by 2-digit numbers

When multiplying 4-digits by 2-digits pupils should be confident in the written method.

If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method.
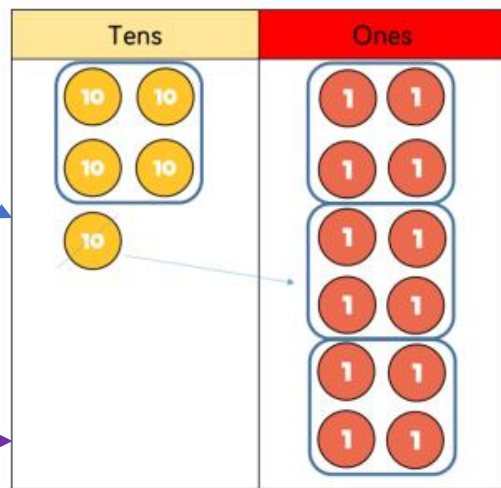
Exchanged digit placement needs to be consistent.

Multiplication and Division | NCETM

Year 5 Multiplication and division

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- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Use the place value counters to divide in order to explore why there are remainders.

$52 \div 4 = 13$

Skill: Divide 2-digit numbers by 1-digit numbers (grouping)

When using the short division method, pupils use grouping. Starting with the largest place value, they group by the divisor.

Language is important. Pupils should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?'

Remainders can also be seen as they are left ungrouped.

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Year 5 Multiplication and division
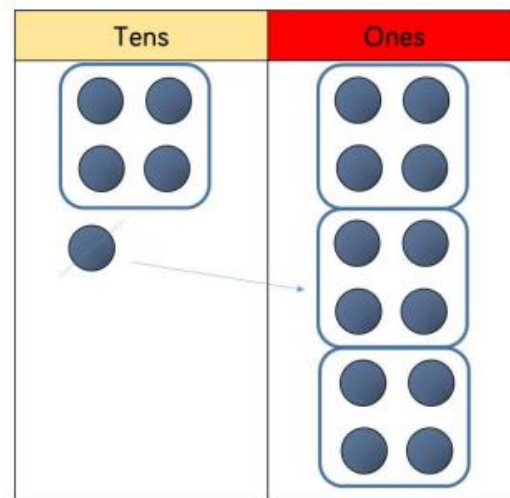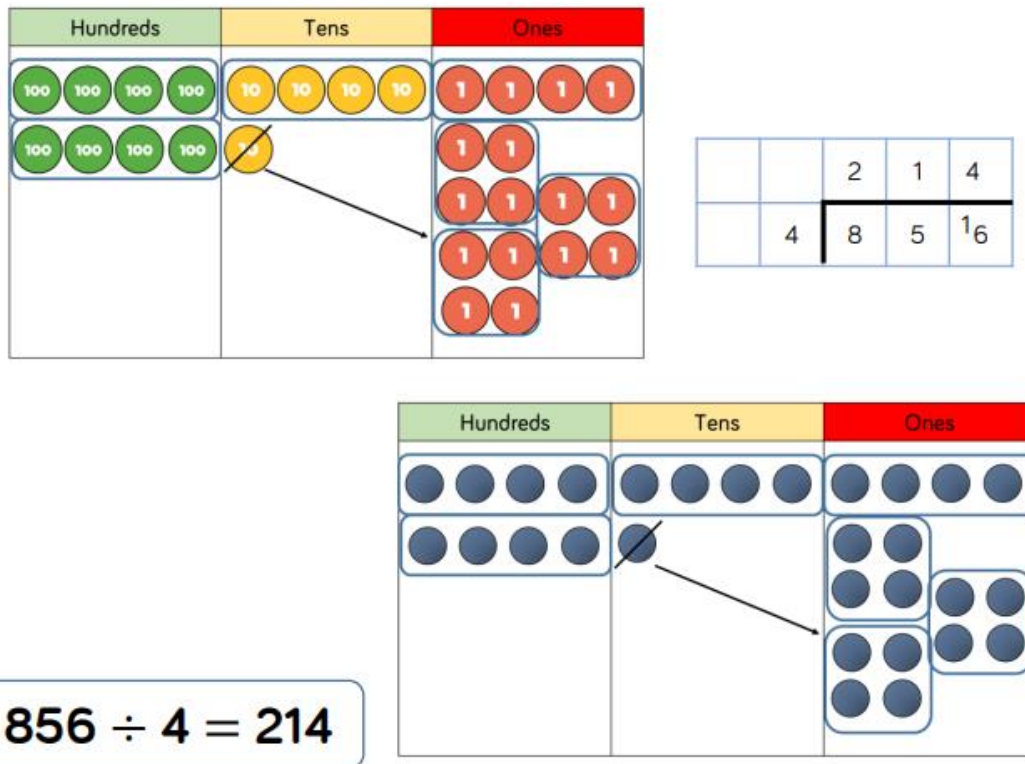
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- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Use place value counters to partition numbers and
then group to develop understanding of the short division method

856 ÷ 4 = 214

Skill: Divide 3-digit numbers by 1-digit numbers (grouping)

Pupils can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit number.
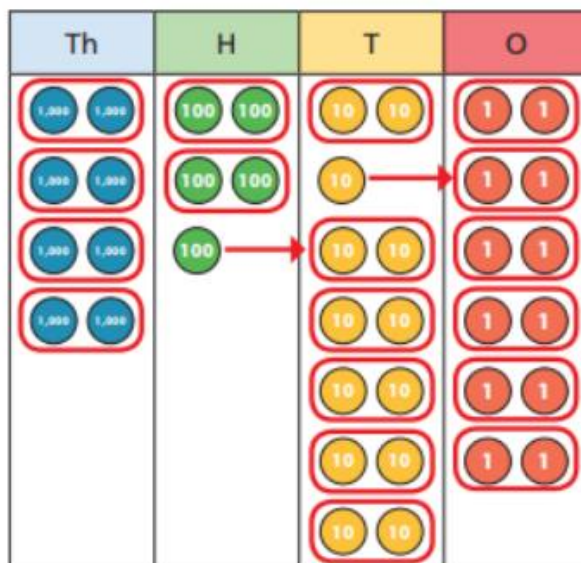
Place value counters or plain counters can be used on a place value grid to support this understanding. Pupils can also draw their own counters and group them through a more pictorial method.

Multiplication and Division | NCETM

Year 5 Multiplication and division

National Curriculum Objectives
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- solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign
- solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.

Children continue to use place value counters to partition and then group their number to further develop their understanding of the short division method.
They start to focus on remainders and build on their learning from Year 4 to understand remainders in context.

$8,532 \div 2 = 4,266$

Skill: Divide 4-digit numbers by 1-digit numbers (grouping)

Place value counters or plain counters can be used on a place value grid to support pupils to divide 4-digits by 1-digit. Pupils can also draw their own counters and group them through a more pictorial method.

Pupils should be encouraged to move away from the concrete and pictorial when dividing numbers with multiple exchanges.

Multiplication and Division | NCETM

The Dean Trust Calculation Policy Year 6

Multiplication and Division

Year 6 Multiplication and division

National Curriculum Objectives
- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context
- perform mental calculations, including with mixed operations and large numbers
- identify common factors, common multiples and prime numbers
- use their knowledge of the order of operations to carry out calculations involving the four operations
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Children will move on from the area model and work towards more formal multiplication methods.
They will start by exploring the role of the zero in the column method and understand its importance.
Children should understand what is happening within each step of the calculation process.

TTh	Th	H	T	O
	2	7	3	9
×			2	8
2 2	1 5	9 3	1 7	2
5 1	4	7 1	8	0
7	6	6	9	2
			1	

$2,739 \times 28 = 76,692$

Skill: Multiply 4-digit numbers by 2-digit numbers

When multiplying 4-digits by 2-digits pupils should be confident in the written method.

If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method.

Exchanged digit placement needs to be consistent.

Multiplication and Division | NCETM

Year 6 Multiplication and division

National Curriculum Objectives
- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context
- perform mental calculations, including with mixed operations and large numbers
- identify common factors, common multiples and prime numbers
- use their knowledge of the order of operations to carry out calculations involving the four operations
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Children perform short divisions both with integer answers and where there is a remainder. They interpret the remainder in context, for example knowing that "4 remainder 1" could mean 4 complete boxes with 1 left over so 5 boxes will be needed.
Children may need to list multiples of the number they are dividing by to help them if their times-table knowledge is not secure.

$$432 \div 12 = 36$$

$$7,335 \div 15 = 489$$

15	30	45	60	75	90	105	120	135	150

Skill: Divide multi digits by 2-digits (short division)

When pupils begin to divide up to 4-digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective.

Pupils can write out multiples to support their calculations with larger remainders.

Pupils will also solve problems with remainders where the quotient can be rounded as appropriate.

Multiplication and Division | NCETM

Year 6 Multiplication and division

National Curriculum Objectives
- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
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- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Children may need to list multiples of the number they are dividing by to help them if their times-table knowledge is not secure.

Children should always check that the remainder is less than the number they are dividing by.

$12 \times 1 = 12$
$12 \times 2 = 24$
$12 \times 3 = 36$
$12 \times 4 = 48$
$12 \times 5 = 60$
$12 \times 6 = 72$
$12 \times 7 = 84$
$12 \times 8 = 96$
$12 \times 7 = 108$
$12 \times 10 = 120$

$$432 \div 12 = 36$$

$$7,335 \div 15 = 489$$

$1 \times 15 = 15$
$2 \times 15 = 30$
$3 \times 15 = 45$
$4 \times 15 = 60$
$5 \times 15 = 75$
$10 \times 15 = 150$

Skill: Divide multi-digits by 2-digits (long division)

Pupils can also divide 2-digit numbers using long division.

Pupils can write out multiples to support their calculations with larger remainders.

Pupils will also solve problems with remainders where the quotient can be rounded as appropriate.

Multiplication and Division | NCETM

Year 6 Multiplication and division

National Curriculum Objectives
- multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
- divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
- divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context
- perform mental calculations, including with mixed operations and large numbers
- identify common factors, common multiples and prime numbers
- use their knowledge of the order of operations to carry out calculations involving the four operations
- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
- solve problems involving addition, subtraction, multiplication and division
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Children interpret the remainder and/or adjust the number they are dividing. For example, when thinking about packing items into boxes, they consider the number of full boxes or the total number of boxes needed.

$$372 \div 15 = 24 \text{ r}12$$

$1 \times 15 = 15$
$2 \times 15 = 30$
$3 \times 15 = 45$
$4 \times 15 = 60$
$5 \times 15 = 75$
$10 \times 15 = 150$

$$372 \div 15 = 24\frac{4}{5}$$

Skill: Divide multi-digits by 2-digits (long division)

When a remainder is left at the end of a calculation, pupils can either leave it as a remainder or convert it into a fraction.
This will depend on the context of the question.

Pupils can also answer questions where the quotient needs to be rounded according to the context.

Multiplication and Division | NCETM

Multiplication and Division Key Vocab

Array	An ordered collection of counters, cubes or other item in rows and columns.
Commutative	Numbers can be multiplied in any order
Dividend	In division, the number that is divided.
Divisor	In division, the number by which another is divided.
Exchange	Change a number or expression for another of an equal value
Factor	A number that multiples with another to make a product.
Multiplicand	In multiplication, a number to be multiplied by another
Partitioning	Splitting a number into its component parts
Product	The result of multiplying one number by another
Quotient	The result of a division
Remainder	The amount left over after a division when the divisor is not a factor of the dividend.
Scaling	Enlarging or reducing a number by a given amount, called the scale factor.