

GRESHAM PRIMARY SCHOOL CALCULATION POLICY April 2024

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Date for Next Update: April 2026

Signed by:

_____	Headteacher	Date:	_____
_____	Chair of governors	Date:	_____

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STATEMENT OF INTENT

This calculation policy has been written in line with the programmes of study taken from the revised National Curriculum for Mathematics. It provides guidance on appropriate calculation methods and progression. The content shows progression between years under the following headings: addition, subtraction, multiplication and division.

Gresham's maths curriculum (available on the school website) also highlights the progression between these key skills and when they will be introduced and taught.

Children will use mental methods as their first port of call when appropriate, but for calculations that they cannot do in their heads, they will need to use an efficient written method accurately and with confidence.

This policy is design to support both educators and parents in supporting children's understanding and application of calculation.

The emphasis, initially, is on mental calculations skills, but progresses to the written strategies that your child is expected to become familiar with. Whilst this document has been organised into the expected outcomes for each year group, it is important to recognise that children develop their mathematical skills at different rates and that you should work with your child, using a combination of practical, mental and written activities, at a level that is suitable to them.

With this said, it is also important to recognise that the maths curriculum aims to develop reasoning and problem-solving skills. These are developed through carefully planned lessons and home learning and also the result of children adhering to the content of their year group. Children who are highly proficient at maths will be challenged appropriately, but always through extending their knowledge of the content for their year group. Rapid progression through the curriculum does not allow for a clear mathematical understanding of what is 'happening' and whilst children can remember rules and patterns, they will not develop their problem solving and reasoning skills.

AIMS OF THE POLICY

- To ensure consistency and progression in our approach to calculation.
- To ensure that children develop an efficient, reliable, formal written method of calculation for all operations.
- To ensure that children can use these methods accurately with confidence and understanding.
- To give parents/carers the confidence to support children in maths at home.

CPA (Concrete, Pictorial, Abstract)

As a result of an overview of the National Curriculum, in 2013 there was a shift in focus. The term 'mastery' was introduced following the success of programmes such as Shanghai Maths and Singapore Maths.

Mastery refers to children acquiring a deep-rooted and secure understanding of maths. Children are introduced to a concept and once embedded they are then encouraged to rationalise and reason. This promotes a deeper understanding and moves away from children having to learn by rote.

With maths mastery in mind, schools will typically use some variation of the CPA approach.

CPA stands for:

- Concrete
- Pictorial
- Abstract

The CPA approach underpins the aims of the National Curriculum. Historically, there has perhaps been a tendency to show progression in maths by rapidly moving children from topic to topic. However, this can lead to a superficial understanding where children rely on learning by rote or following rules or patterns to achieve success. It does not lend itself to gaining a deep understanding.

CPA focuses on the three key stages of mathematical learning and show how children are taught to build upon existing knowledge.

Concrete refers to the physical objects that children may use to count and order. These could be counters, cubes or other physical apparatus. This physical representation of a number helps children to 'see' what is happening when they are calculating.

Physical representations follow this. This will include children starting to use number-lines, times tables grids, hundred squares and similar. The children have a secure understanding of number and are now able to represent it visually, without needing physical objects in front of them.

Abstract is the final stage. At this point children are very secure and familiar with number and can now use written methods to calculate. This will involve more traditional written methods including the column method for addition, subtraction and multiplication and long and short division. Children will be able to explain how these methods work as throughout their time at primary school they will be encouraged to make links between the three stages.

It is of paramount importance to allow children to progress through these stages equally. Abstract written methods are generally introduced and taught in KS2 where they have spent the majority of EYFS and KS1 focussing on concrete and pictorial examples.

Children who are introduced to abstract concepts too early, without a secure grasp of the concrete and pictorial stages can result in children 'learning by rote' where they can remember a set of rules to find an answer, but they cannot explain how or why their answer is correct.

The following pages offer visual examples of how the four operations (addition, subtraction, multiplication and division) are taught throughout Gresham.

Early Years

A key priority of any Primary School maths curriculum is to ensure that children develop a strong sense of number and place value. Children will continually encounter numbers in the world around them. The ability to recognise the symbol 5, and name it, is very different from understanding the 'fiveness' of it, and it is the development of this latter skill that is crucial to a child's mathematical ability.

Furthermore, it is important to recognise that just because a child can recite number names in order, does **not** necessarily mean that they can count. As with learning the alphabet, children can recall a sequence of numbers by rote without any real grasp or understanding of what they mean (hence young children often omit numbers as they count). Gaining familiarity with number names through songs and rhymes is of course helpful, but emphasis should be placed on helping children make links between these number names and the number of objects they equate to.

In the Foundation Stage, as well as teaching the children to count objects, significant attention is given to cultivating number recognition and the development of mental representations. In order to do this, much of their experience with number play in the early years will involve concrete, movable objects. In the Foundation Stage, this secure knowledge of number and place value underpins all calculation that may be taught later in children's school lives.

Constant repetition, embedding and teaching of these key skills ensure the children's deep understanding of number and in the Foundation Stage this can be taught in a number of ways including:

- Writing numbers
- Accurate 1-1 correspondence (touch it, move it, count it).
- A secure understanding of 'what' a number is.
- Recognising numbers visually.
- Use of concrete materials (Dienes and numicon)
- Counting forwards and backwards through a number-line.

The school utilises the White Rose Scheme for maths.

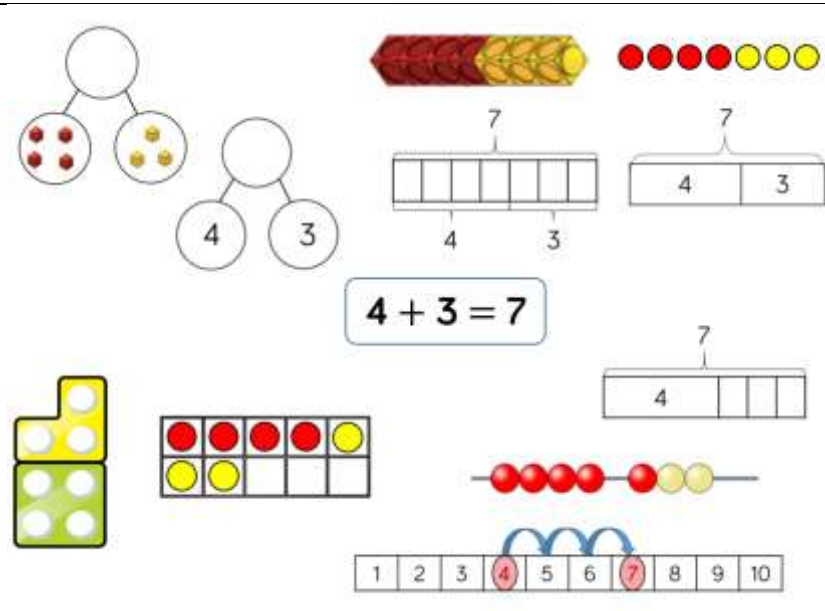
Addition

Below outlines the progressive steps within addition, alongside the representations and models used to teach these.

Skill	Year	Representation and Models*	
Add two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes	Ten frames (within 10) Bead strings (10) Number tracks
Add 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)	Bead strings (20) Number tracks Number lines (labelled) Straws
Add three 1-digit numbers	2	Part-whole model Bar model	Ten frames (within 20) Number shapes
Add 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled)	Number lines (blank) Straws Hundred square
Add two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws	Base 10 Place value counters
Add with up to 3-digits	3	Part-whole model Bar model	Base 10 Place value counters Column addition
Add with up to 4-digits	4	Part-whole model Bar model	Base 10 Place value counters Column addition
Add with more than 4 digits	5	Part-whole model Bar model	Place value counters Column addition
Add with up to 3 decimal places	5	Part-whole model Bar model	Place value counters Column addition

Skill: Add 1-digit numbers within 10

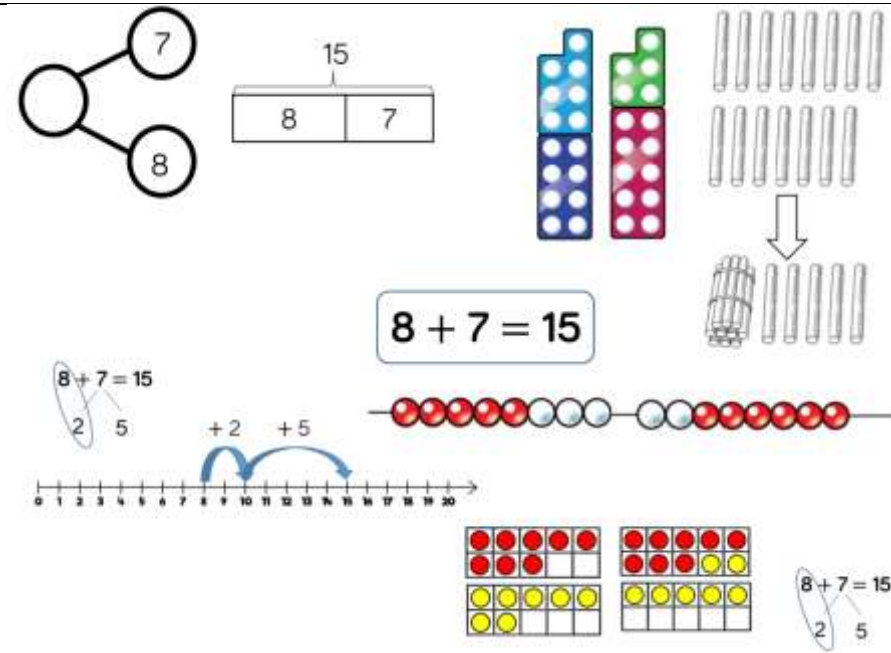
Year 1



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

Skill: Add 1 and 2 -digit numbers to 20

Year 1



When adding one - digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten. In Year 1, this is only done just by counting on. From Year 2, use different manipulatives can be used to represent this exchange alongside number lines to support children in understanding how to partition their jumps.

Skill: Add three 1 -digit numbers

Year 2

$7 + 6 + 3 = 16$

When adding three 1 -digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently. This supports children in their understanding of commutativity. Manipulatives that highlight number bonds to 10 are effective when adding three 1 -digit numbers.

Skill: Add 1-digit and 2-digit numbers to 100

Year 2

$38 + 5 = 43$

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

When adding single digits to a two-digit number, children should be encouraged to count on from the larger number. They 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 the number bond to 10.

Skill: Add two 2-digit numbers to 100

Year 2

38 + 23 = 61

Tens	Ones
38	23
61	

Children can use a blank number line and other representations to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient. From Year 3, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.

Skill: Add numbers with up to 3 digits

Year 3

265 + 164 = 429

Hundreds	Tens	Ones
265	164	
429		

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

Skill: Add numbers with up to 4 digits

Year 4

1,378 + 2,148 = 3,526

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

Skill: Add numbers with more than 4 digits

Year 5

104,328 + 61,731 = 166,059

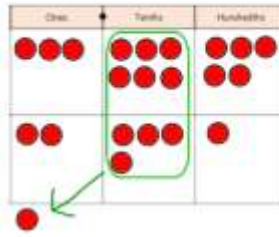
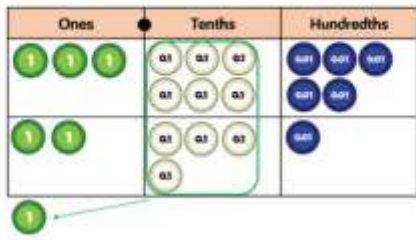
Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits. At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.

Skill: Add with up to 3 decimal places

Year 5/6

The diagram illustrates the addition of 2.41 and 3.65. On the left, two circles labeled '2.41' and '3.65' are connected by lines to a central circle containing a question mark. To the right, a number line is shown with a bracket above it labeled with a question mark. Below the number line, two boxes represent the numbers 3.65 and 2.41. To the right of the number line is a vertical addition problem: $3.65 + 2.41 = 6.06$. Below the addition problem is a small '1' with an arrow pointing to the ones place of the result.

$$3.65 + 2.41 = 6.06$$



Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1, 2 and then 3 decimal places. Ensure children have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other measures.

Subtraction

Below outlines the progressive steps within subtraction, alongside the representations and models used to teach these.

Skill	Year	Representation and Models	
Subtract two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes	Ten frames (within 10) Bead strings (10) Number tracks
Subtract 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)	Bead string (20) Number tracks Number lines (labelled) Straws
Subtract 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled)	Number lines (blank) Straws Hundred square
Subtract two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws	Base 10 Place value counters
Subtract with up to 3- digits	3	Part-whole model Bar model	Base 10 Place value counters Column subtraction
Subtract with up to 4- digits	4	Part-whole model Bar model	Base 10 Place value counters Column subtraction
Subtract with more than 4 digits	5	Part-whole model Bar model	Place value counters Column subtraction
Subtract with up to 3 decimal places	5	Part-whole model Bar model	Place value counters Column subtraction

Skill: Subtract 1-digit numbers within 10

Year 1

7

?

3

7

?

3

$7 - 3 = 4$

First

Then

Now

1 2 3 4 5 6 7 8 9 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.

Skill: Subtract 1 and 2-digit numbers to 20

Year 1/2

6

14

?

14

6

8

$14 - 6 = 8$

14 - 6 = 8

4 2

-2 -4

14 - 6 = 8

4 2

In Year 1, subtracting one-digit numbers that cross 10, is done by counting back, using objects, number tracks and number lines. From Year 2, children 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.

Skill: Subtract 1 and 2-digit numbers to 100

Year 2/3

65

28

65

?

28

$65 - 28 = 37$

Tens	Ones
4 bars, 2 crossed out	5 dots, 2 crossed out

$$\begin{array}{r} 65 \\ - 28 \\ \hline 37 \end{array}$$

Tens	Ones
3 yellow circles, 2 crossed out	7 green circles, 2 crossed out

Children can also use a blank number line to count back to find the difference. Encourage them to jump to multiples of 10 to become more efficient. From Year 3, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.

Skill: Subtract numbers with up to 3 digits

Year 3

435

273

?

435

273

?

$435 - 273 = 162$

Hundreds	Tens	Ones
4 squares, 2 crossed out	3 bars, 2 crossed out	5 dots, 2 crossed out

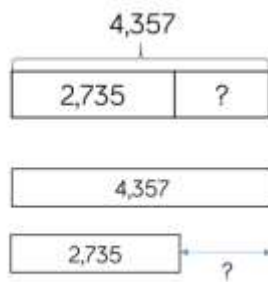
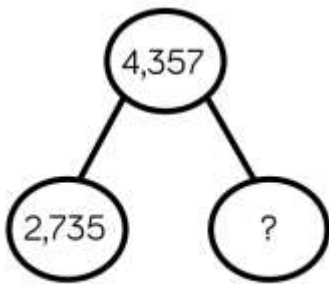
$$\begin{array}{r} 435 \\ - 273 \\ \hline 162 \end{array}$$

Hundreds	Tens	Ones
1 red block	6 yellow bars, 1 crossed out	2 green dots, 1 crossed out

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

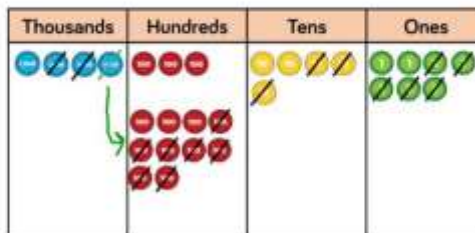
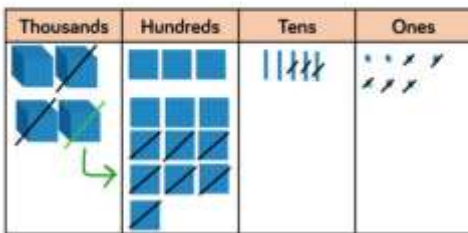
Skill: Subtract numbers with up to 4 digits

Year 4



$$\begin{array}{r} 3 \ 1 \\ 4357 \\ - 2735 \\ \hline 1622 \end{array}$$

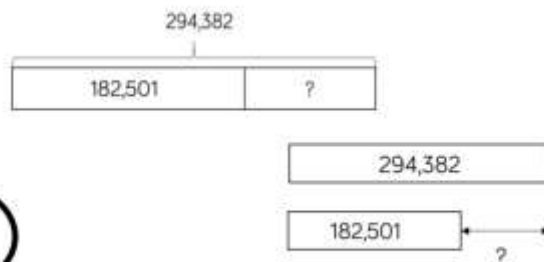
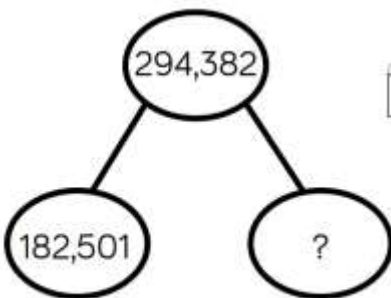
$$4,357 - 2,735 = 1,622$$



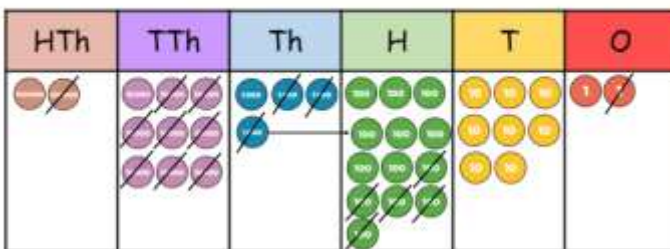
Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits. Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method. Plain counters on a place value grid can also be used to support learning.

Skill: Subtract numbers with more than 4 digits

Year 5/6



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

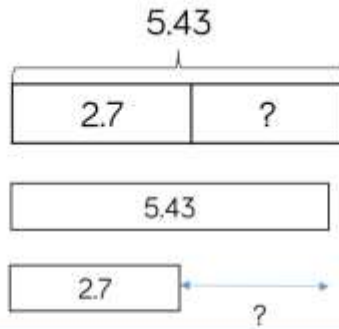
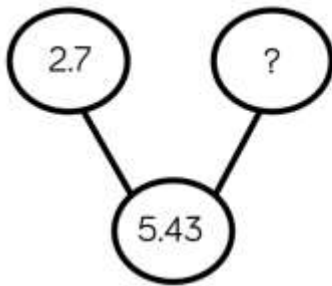


	2	9	3	1 3	8	2
-	1	8	2	5	0	1
	1	1	1	8	8	1

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, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.

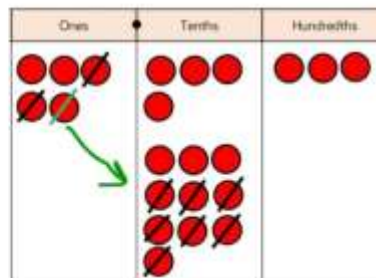
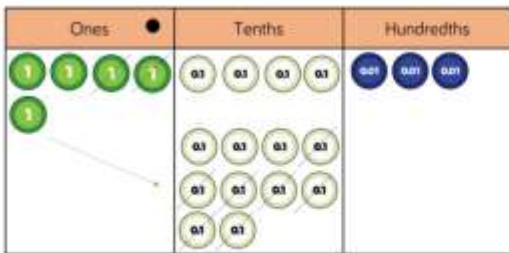
Skill: Subtract with up to 3 decimal places

Year 5/6



$$\begin{array}{r} 4 \quad 1 \\ 5.43 \\ - 2.7 \\ \hline 2.73 \end{array}$$

$$5.43 - 2.7 = 2.73$$



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

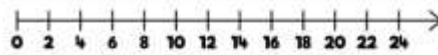
Multiplication – Times Tables

Below outlines the progressive steps within times tables, alongside the representations and models used to teach these.

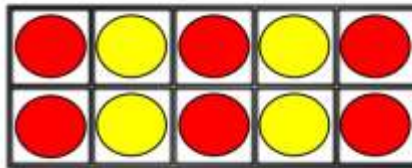
Skill	Year	Representation and Models*	
Recall and use multiplication and division facts for the 2-times table	2	Bar model Number shapes Counters Money	Ten frames Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 5-times table	2	Bar model Number shapes Counters Money	Ten frames Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 10-times table	2	Hundred square Number shapes Counters Money	Ten frames Bead strings Number lines Base 10
Recall and use multiplication and division facts for the 3-times table	3	Hundred square Number shapes Counters	Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 4-times table	3	Hundred square Number shapes Counters	Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 8-times table	3	Hundred square Number shapes	Bead strings Number tracks Everyday objects
Recall and use multiplication and division facts for the 6-times table	4	Hundred square Number shapes	Bead strings Number tracks Everyday objects
Recall and use multiplication and division facts for the 7-times table	4	Hundred square Number shapes	Bead strings Number lines
Recall and use multiplication and division facts for the 9-times table	4	Hundred square Number shapes	Bead strings Number lines
Recall and use multiplication and division facts for the 11-times table	4	Hundred square Base 10	Place value counters Number lines
Recall and use multiplication and division facts for the 12-times table	4	Hundred square Base 10	Place value counters Number lines

Skill: 2 times table

Year 2



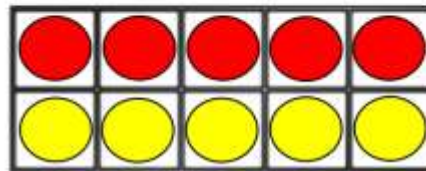
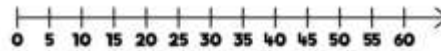
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50



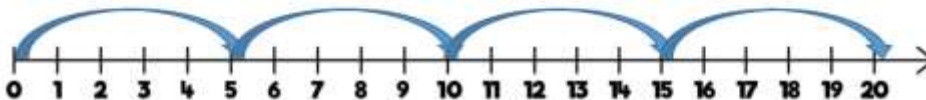
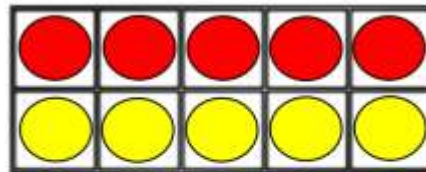
Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the two times table, using concrete manipulatives to support. Notice how all the numbers are even and there is a pattern in the ones. Use different models to develop fluency.

Skill: 5 times table

Year 2



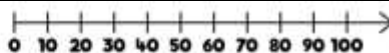
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50



Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the five times table, using concrete manipulatives to support. Notice the pattern in the ones as well as highlighting the odd, even, odd, even pattern.

Skill: 10 times table

Year 2



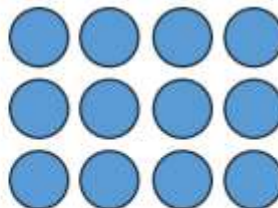
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11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93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



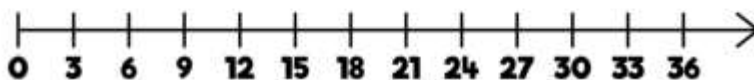
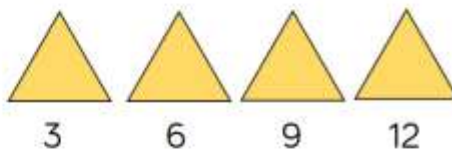
Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the ten times table, using concrete manipulatives to support. Notice the pattern in the digits - the ones are always 0, and the tens increase by 1 ten each time.

Skill: 3 times table

Year 3



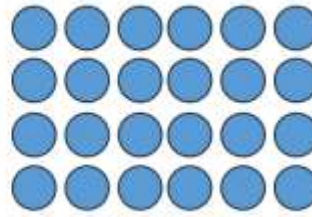
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50



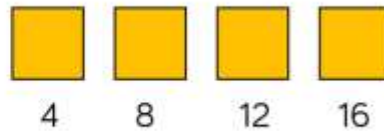
Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the three times table, using concrete manipulatives to support. Notice the odd, even, odd, even pattern using number shapes to support. Highlight the pattern in the ones using a hundred square.

Skill: 4 times table

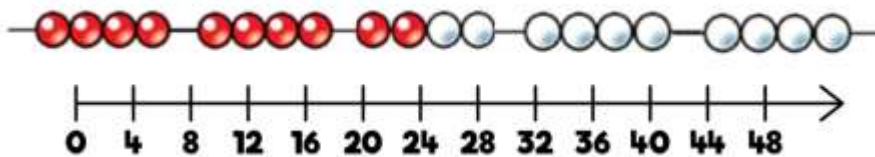
Year 3



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



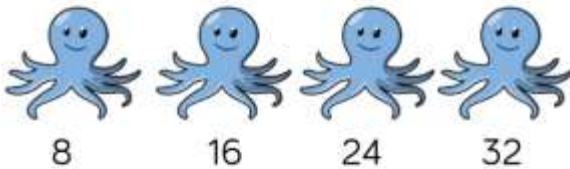
Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the four times table, using manipulatives to support. Make links to the 2 times table, seeing how each multiple is double the twos. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support

Skill: 8 times table

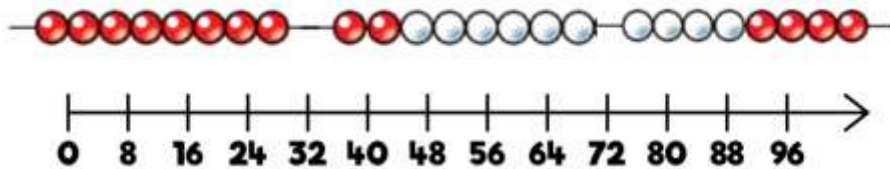
Year 3



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	40
48	56	64	72	80



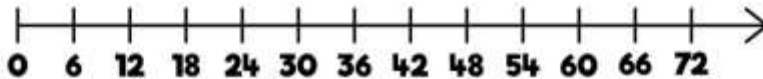
Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the eight times table, using manipulatives to support. Make links to the 4 times table, seeing how each multiple is double the fours. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support

Skill: 6 times table



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

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



Year 4

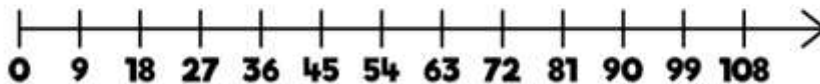
Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the six times table, using manipulatives to support. Make links to the 3 times table, seeing how each multiple is double the threes. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support.

Skill: 9 times table



9	18	27	36	45
54	63	72	81	90

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



Year 4

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the nine times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using the hundred square to support as well as noting the odd, even pattern within the multiples.

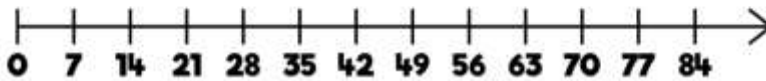
Skill: 7 times table

Year 4



7	14	21	28	35
42	49	56	63	70

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



Encourage daily counting in multiples both forwards and backwards, supported by a number line or a hundred square. The seven times table can be trickier to learn due to the lack of obvious pattern in the numbers, however they already know several facts due to commutativity. Children can still see the odd, even pattern in the multiples using number shapes to support.

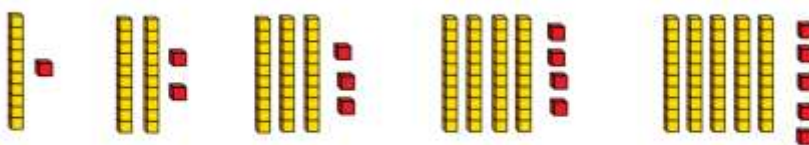
Skill: 11 times table

Year 4

11	22	33	44	55	66
77	88	99	110	121	132



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



Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the eleven times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using the hundred square to support. Also consider the pattern after crossing 100

Skill: 12 times table

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

Year 4

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

Multiplication

Skill	Year	Representations and Models	
Solve one-step problems with multiplication	1/2	Bar model Number shapes Counters	Ten frames Bead strings Number lines
Multiply 2-digit by 1- digit numbers	3/4	Place value counters Base 10	Expanded written method Short written method
Multiply 3-digit by 1- digit numbers	4	Place value counters Base 10	Short written method
Multiply 4-digit by 1- digit numbers	5	Place value counters	Short written method
Multiply 2-digit by 2- digit numbers	5	Place value counters Base 10	Short written method Grid method
Multiply 2-digit by 3- digit numbers	5	Place value counters	Short written method Grid method
Multiply 2-digit by 4- digit numbers	5/6	Formal written method	

Skill: Solve 1-step problems using multiplication

Year 1/2

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

$$5 + 5 + 5 + 5 = 20$$

$$4 \times 5 = 20$$

$$5 \times 4 = 20$$

Children represent multiplication as repeated addition in many different ways. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally. In Year 2, children are introduced to the multiplication symbol.

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

Year 3/4

	H	T	O
		3	4
x			5
	1	7	0

$34 \times 5 = 170$

	H	T	O
		3	4
x			5
	1	7	0

Informal methods and the expanded method are used in Year 3 before moving on to the short multiplication method in Year 4. Place value counters should be used to support the understanding of the method rather than supporting the multiplication, as children should use times table knowledge

Skill: Multiply 3-digit numbers by 1-digit numbers

Year 4

$245 \times 4 = 980$

	H	T	O
	2	4	5
x			4
	9	8	0
	1	2	

When moving to 3-digit by 1-digit multiplication, encourage children to move towards the short, formal written 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 children away from resources when multiplying larger numbers.

Hundreds	Tens	Ones
200 200	40 40 40 40	5 5 5
900	80 80	0

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

Year 5

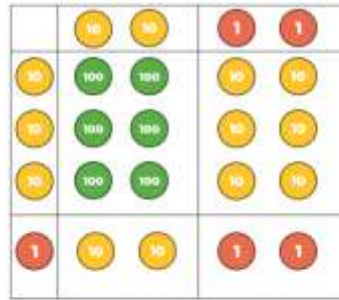
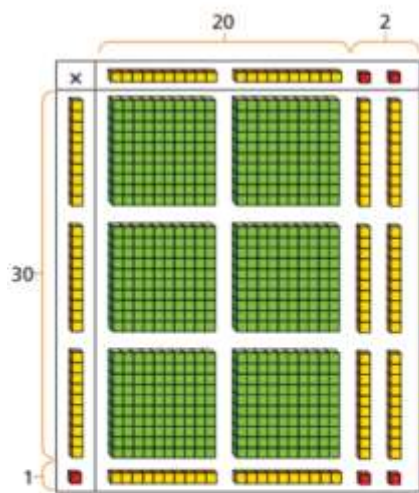
$1,826 \times 3 = 5,478$

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

When multiplying 4-digit numbers, place value counters are the best manipulative to use to support children in their understanding of the formal written method. If children are multiplying larger numbers and struggling with their times tables, encourage the use of multiplication grids so children can focus on the use of the written method.

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

Year 5



×	20	2
30	600	60
1	20	2

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

$22 \times 31 = 682$

When multiplying a multi-digit number by 2-digits, use the area model to help children understand the size of the numbers they are using. This links to finding the area of a rectangle by finding the space covered by the Base 10. The grid method matches the area model as an initial written method before moving on to the formal written multiplication method

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

Year 5



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

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

$234 \times 32 = 7,488$

Children 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 numbers. Children should now move towards the formal written method, seeing the links with the grid method

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

Year 5/6

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

1

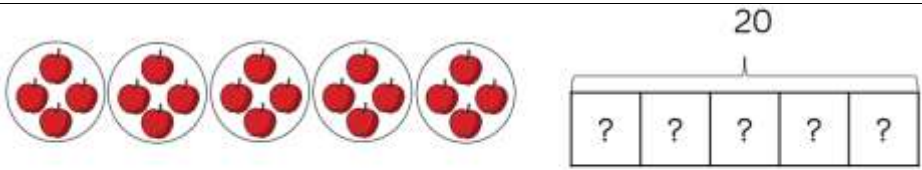
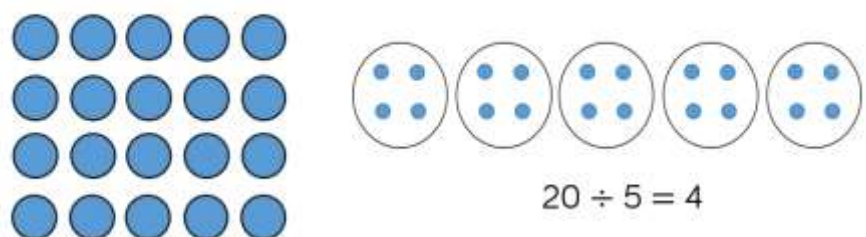
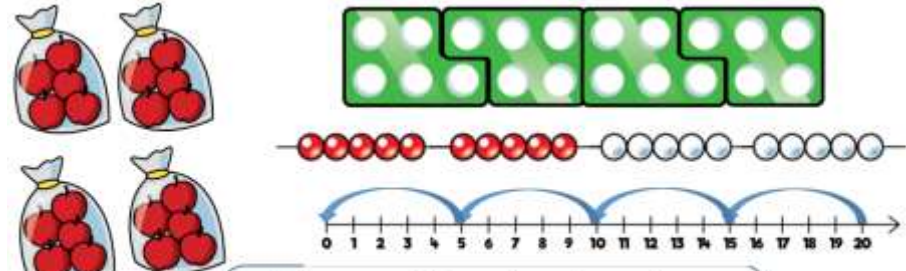
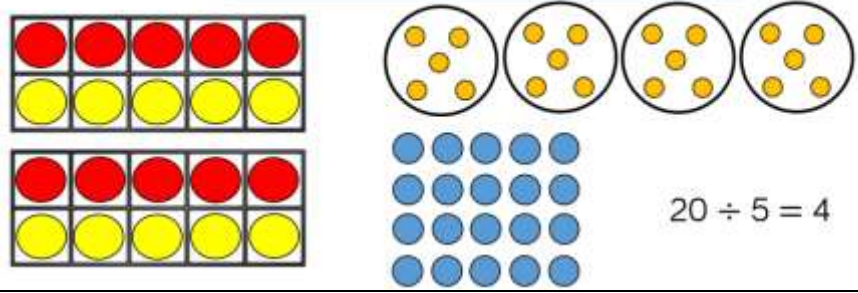
$$2,739 \times 28 = 76,692$$

When multiplying 4-digits by 2-digits, children should be confident in using the formal 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. Consider where exchanged digits are placed and make sure this is consistent

Division

Below outlines the progressive steps within division, alongside the representations and models used to teach these.

Skills	Year	Representations and Models	
Solve one-step problems with division (sharing)	1/2	Bar model Real life objects	Arrays Counters
Solve one-step problems with division (grouping)	1/2	Real life objects Number shapes Bead strings Ten frames	Arrays Counters
Divide 2-digits by 1- digit (no exchange sharing)	3	Straws Base 10 Bar mode	Place value counters Part-whole model
Divide 2-digits by 1- digit (sharing with exchange)	3	Straws Base 10 Bar model	Place value counters Part-whole model
Divide 2-digits by 1- digit (sharing with remainders)	3/4	Straws Base 10 Bar model	Place value counters Part-whole model
Divide 2-digits by 1- digit (grouping)	4/5	Place value counters Counters	Place value grid Written short division
Divide 3-digits by 1- digit (sharing with exchange)	4	Base 10 Bar model	Place value counters Part-whole model
Divide 3-digits by 1- digit (grouping)	4/5	Place value counters Counters	Place value grid Written short division
Divide 4-digits by 1- digit (grouping)	5	Place value counters Counters	Place value grid Written short division
Divide multi-digits by 2-digits (short division)	6	Written short division	List of multiples
Divide multi-digits by 2-digits (long division)	6	Written short division	List of multiples

<p>Skill: Solve 1-step problems using multiplication (sharing)</p>	<p>Year 1/2</p>
 <p>There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag?</p>  <p>$20 \div 5 = 4$</p>	<p>Children solve problems by sharing amounts into equal groups. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally. In Year 2, children are introduced to the division symbol.</p>
<p>Skill: Solve 1-step problems using division (grouping)</p>	<p>Year 1/2</p>
 <p>There are 20 apples altogether. They are put in bags of 5. How many bags are there?</p>  <p>$20 \div 5 = 4$</p>	<p>Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line. They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.</p>

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

Year 3

Tens	Ones
●●	●●●●
●●	●●●●

$48 \div 2 = 24$

48

40 8

÷ 2 ÷ 2

□ □

When dividing larger numbers, children 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 children with a clear written method that matches the concrete representation.

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

Year 3/4

Tens	Ones
●●●●●	●●
●●●●●	●●
●●●●●	●●
●●●●●	●●

$52 \div 4 = 13$

52

40 12

÷ 4 ÷ 4

10 3

10 + 3 = 13

52

?	?	?	?
---	---	---	---

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

Skill: Divide 2-digits by 1-digit (sharing with remainders)

Year 3/4

$53 \div 4 = 13 \text{ r}1$

When dividing numbers with remainders, children can use Base 10 and place value counters to exchange one ten for ten ones. Starting with the equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made. Flexible partitioning in a part-whole model supports this method.

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

Year 5

$52 \div 4 = 13$

When using the short division method, children use grouping. Starting with the largest place value, they group by the divisor. Language is important here. Children 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.

Skill: Divide 3-digits by 1-digit (sharing)

Year 4

844 ÷ 4 = 211

856 ÷ 4 = 214

Children can continue to use place value counters to share 3-digit numbers into equal groups. Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows. This method can also help to highlight remainders. Flexible partitioning in a part-whole model supports this method.

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

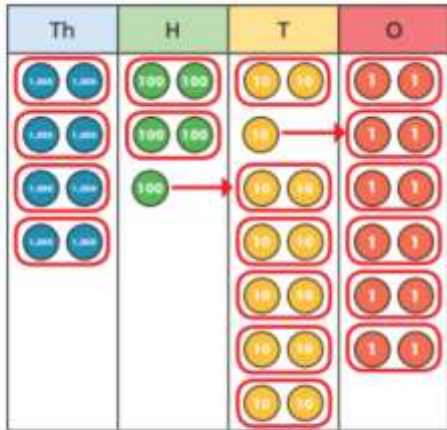
Year 5

856 ÷ 4 = 214

Children 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. Children can also draw their own counters and group them through a more pictorial method.

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

Year 5



	4	2	6	6
2	8	5	13	12

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

Place value counters or plain counters can be used on a place value grid to support children to divide 4- digits by 1-digit. Children can also draw their own counters and group them through a more pictorial method. Children should be encouraged to move away from the concrete and pictorial when dividing numbers with multiple exchanges.

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

Year 6

		0	3	6
	12	4	43	72

$$432 \div 12 = 36$$

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

	0	4	8	9
15	7	73	133	135

15	30	45	60	75	90	105	120	135	150
----	----	----	----	----	----	-----	-----	-----	-----

When children begin to divide up to 4- digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective. Children can write out multiples to support their calculations with larger remainders. Children will also solve problems with remainders where the quotient can be rounded as appropriate.

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

Year 6

		0	3	6
1	2	4	3	2
	-	3	6	0
			7	2
	-		7	2
				0

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

$$432 \div 12 = 36$$

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

		0	4	8	9
15	7	3	3	5	
	-	6	0	0	0
		1	3	3	5
	-	1	2	0	0
			1	3	5
	-		1	3	5
					0

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

Children can also divide by 2-digit numbers using long division. Children can write out multiples to support their calculations with larger remainders. Children will also solve problems with remainders where the quotient can be rounded as appropriate.

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

Year 6

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

			2	4	r	1	2
1	5	3	7	2			
	-	3	0	0			
			7	2			
	-		6	0			
			1	2			

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

			2	4	$\frac{4}{5}$
1	5	3	7	2	
	-	3	0	0	
			7	2	
	-		6	0	
			1	2	

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

When a remainder is left at the end of a calculation, children can either leave it as a remainder or convert it to a fraction. This will depend on the context of the question. Children can also answer questions where the quotient needs to be rounded according to the context.

Monitoring and Review

This policy is reviewed biennially by the headteacher. Any changes or amendments to this policy will be communicated to all staff members by the headteacher. The scheduled review date for this policy is April 2026.