CALCULATION POLICY

DORDON PRIMARY SCHOOL

WOOD END PRIMARY SCHOOL

OVERVIEW

Predominantly, we use White Rose Maths to sequence and resource our lessons, however this is supplemented with further resources and schemes to ensure the best outcomes for our pupils.

Throughout this policy, we have adapted the White Rose Maths calculation policies, to ensure that our curriculum is well-sequenced, and follows a clear progression from EYFS to Year 6.

Each year group will have an example of the different models and images which will support the teaching of different concepts. These provide explanations of the benefits of using the models and show links between different operations.

A glossary of terms is provided below to support understanding of key language to support teaching the four operations.

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 is subtracted.

Partitioning – Splitting a number into its component parts.

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.

EYFS

The guidance for EYFS follows the Educational Programme for Mathematics (DfE March 2021) and supports EYFS practitioners to deliver a curriculum that embeds mathematical thinking and talk. We support the ethos of Early Years; however, we enable practitioners to create a mathematically rich environment. Key mathematical concepts will be revisited and embedded throughout the year.

1. **The one-one principle.** This involves children assigning one number name to each object that is being counted. Children need to ensure that they count each object only once ensuring they have counted every object.

2. **The stable-order principle.** Children understand when counting, the numbers have to be said in a certain order.

3. **The cardinal principle.** Children understand that the number name assigned to the final object in a group is the total number of objects in that group.

4. **The abstraction principle.** This involves children understanding that anything can be counted including things that cannot be touched including sounds and movements e.g. jumps.

5. **The order-irrelevance principle.** This involves children understanding that the order we count a group of objects is irrelevant. There will still be the same number.

Key Language for Teachers

Cardinal - The number that indicates how many there are in a set.

Classification – The identification of an object by specific attributes, such as colour, texture, shape or size.

Conservation (of number) – The recognition that the number stays the same if none have been added or taken away.

Numeral - The written symbol for a number; e.g. 3, 2, 1

Ordinal - A number denoting the position in a sequence e.g. 1st, 2nd, 3rd, etc or page 1, page 2, page 3…

Partition - Separate a set into two or more subsets e.g. Partition a set of socks into plain and patterned.

Subitise - Instantly recognise a small quantity, without having to count how many there are.

Number - Number can be:

- a count of a collection of items e.g. three boxes,
- a measure e.g. of length or weight, or
- a label e.g. the number 17 bus

Quantity - The amount you have of something e.g. a cup of flour, three boxes, half an hour.

Reception – Notes and Guidance

Important Links and Websites

The NCETM Early Years Area

The aim of this section is to help teachers and practitioners in Early Years settings have a clearer understanding of how children build early number sense, and to provide tips on how best to support that learning.

https://www.ncetm.org.uk/resources/51439

Number Blocks

Numberblocks, first broadcast in January 2017, is a pre-school BBC television series aimed at introducing children to early number.

Snappy animation and loveable characters combine with engaging storylines to gently introduce concepts of number to support early mathematical understanding.

https://www.bbc.co.uk/cbeebies/shows/numberblocks

NRICH

The NRICH Early Years resources aim to further develop young children's natural problem-solving abilities in the context of mathematics.

https://nrich.maths.org/early-years

Learning Trajectories

[LT]² is a web-based tool for early childhood educators to learn about how children think and learn about mathematics and how to teach mathematics to young children (birth to age 8).

https://www.learningtrajectories.org/

Early Math Collaborative

The Erikson Institute Early Math Collaborative is transforming the understanding, teaching and learning of early mathematics from the ground up.

https://earlymath.erikson.edu/

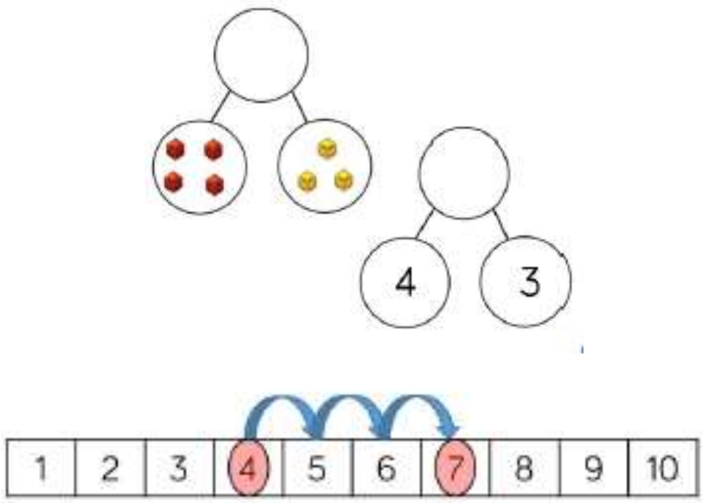
EEF Improving Mathematics in the EY and KS1

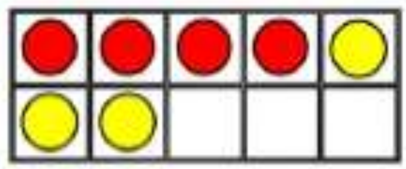
This guidance report summarises the latest research into early maths education and offers 5 practical recommendations for teachers to support the learning of children aged 3-7.

https://educationendowmentfoundation.org.uk/tools/guidance-reports/early-maths/

YEAR ONE

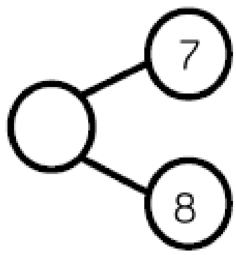
Skill: Add 1-digit numbers within 10

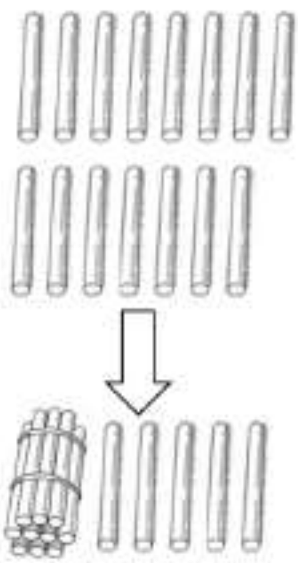


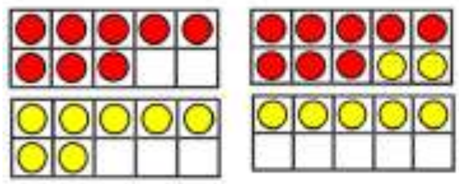


Using the part-whole model, ten frames and basic number lines, alongside concrete resources will support children to understand and build their understanding of adding numbers.

Skill: Add 1 and 2 – digit numbers to 20



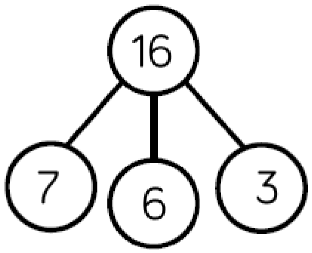


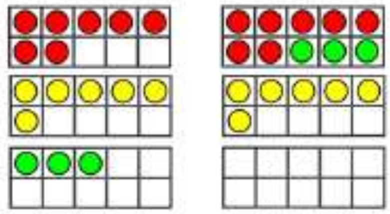


Using the part-whole model, ten frames and concrete resources, such as straws, the children will understand and build their understanding of adding numbers.

YEAR TWO

Skill: Add three 1-digit numbers





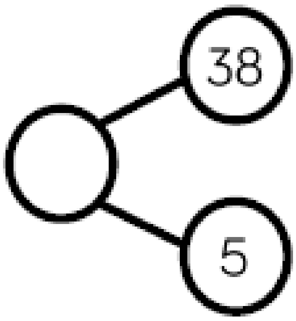
$$7 + 6 + 3 = 16$$

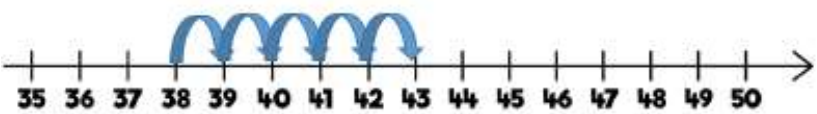
Encourage children to look for number bonds to ten, when adding 3 numbers.

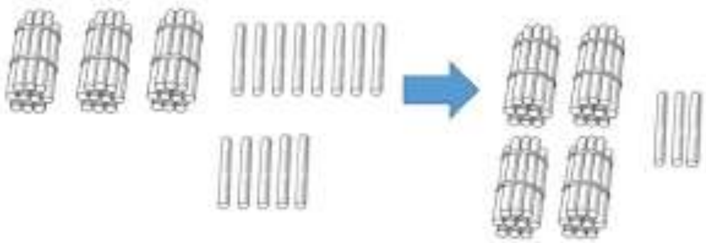
Manipulatives to support this, such as pictorial representations of the ten's frames, will support this.

It is important that children begin to see calculations being written into number sentences.

Skill: Add 1 and 2-digit numbers to 100





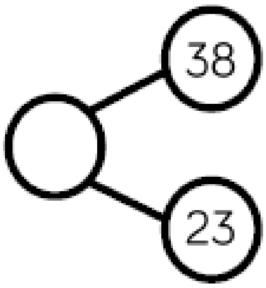


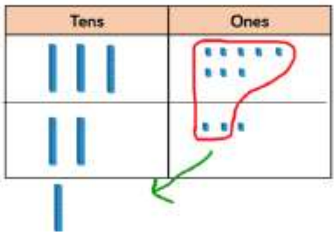
Children need to be encouraged to count on from the larger number.

They should also be prompted to apply their knowledge of number bonds to add more efficiently.

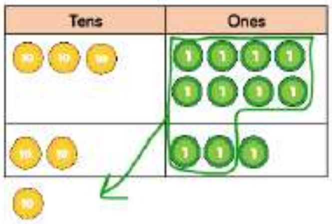
Skill: Add 2-digit numbers to 100

Pictorial representations are important to use alongside introducing children to formal written methods, in preparation for KS2.



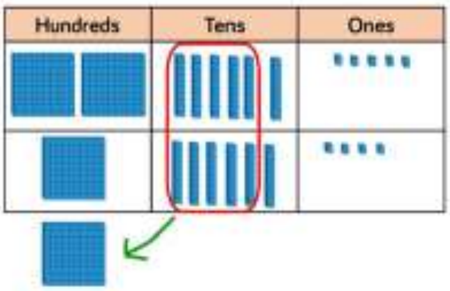



```
  38
+ 23
  61
  1
```

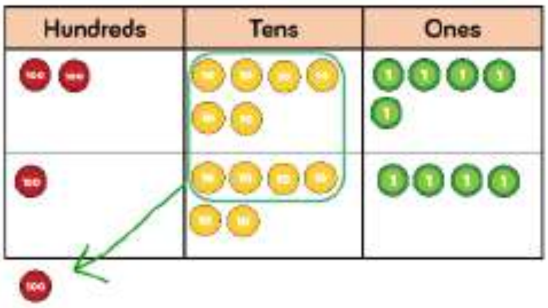


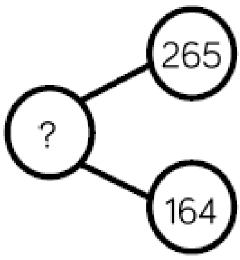
YEAR THREE

Skill: Add numbers with up to 3 digits




```
  265
+ 164
  429
  1
```

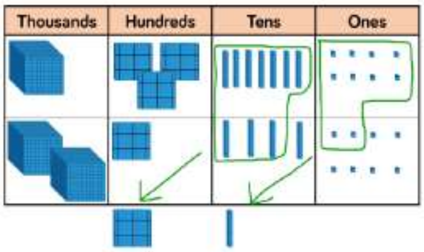


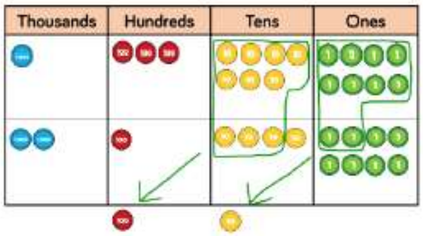


Ensure children write out formal written methods alongside pictorial representations or concrete resources, so they can see links between them.

YEAR FOUR

Skill: Add numbers with up to 4 digits



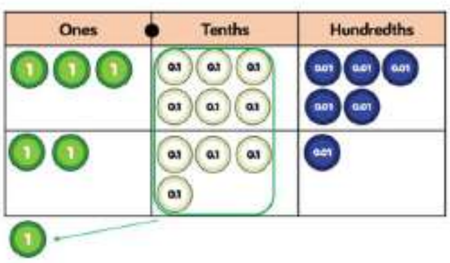


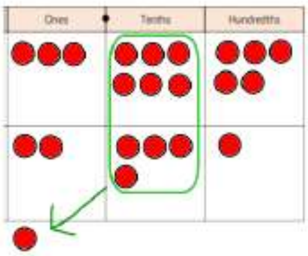
$$\begin{array}{r} 1378 \\ +\,2148 \\ \hline 3526 \\ \hline {}_{1\,1\,\,} \end{array}$$

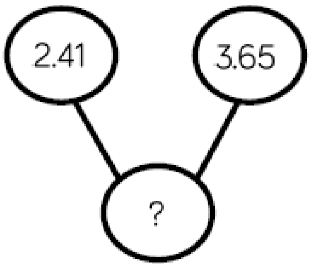
Ensure children write out formal written methods alongside pictorial representations or concrete resources, so they can see links between them.

YEAR FIVE

Skill: Add with up to 3 decimal places





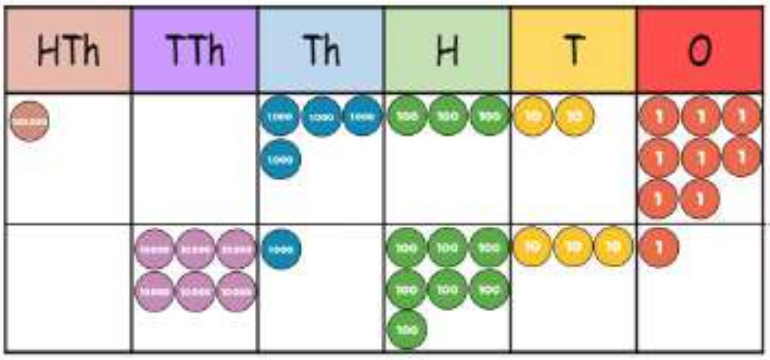


$$\begin{array}{r} 3.65 \\ +\,2.41 \\ \hline 6.06 \\ \hline {}_{1\,\,\,\,\,\,\,\,} \end{array}$$

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

Ensure children are using formal written methods alongside pictorial representations. Children also need to have experience of putting decimals into contexts, such as adding money or with measures.

Skill: Add numbers with more than 4 digits



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

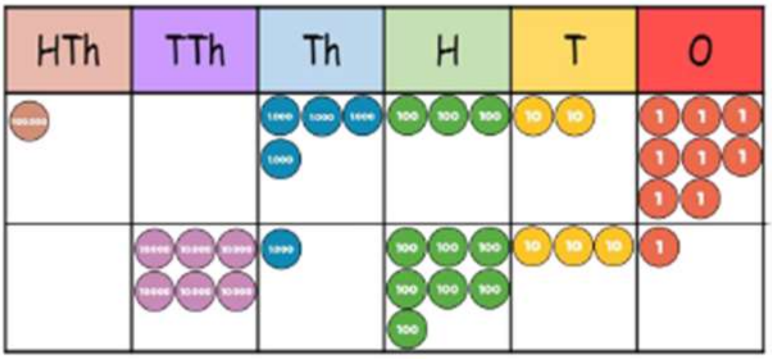
1

Place value counters and plain counters on a place value grid are the most effective manipulatives when adding.

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

YEAR SIX

Skill: Add numbers with more than 4 digits



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

1

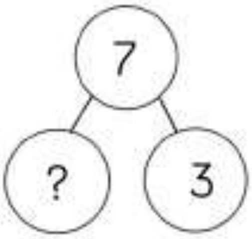
Place value counters and plain counters on a place value grid are the most effective manipulatives when adding.

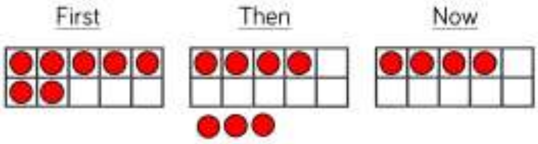
At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.

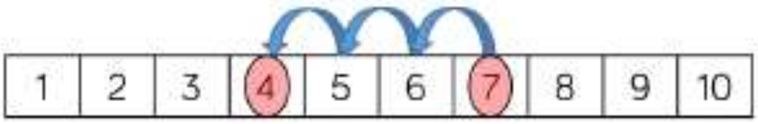
Subtraction

YEAR ONE

Skill: Subtract 1-digit numbers within 10





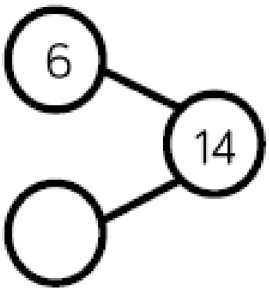


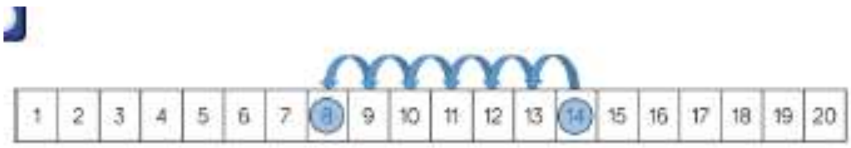
Part whole models can be used to support partitioning.

Tens frames and number lines can support reduction.

Concrete resources can be used alongside pictorial representations

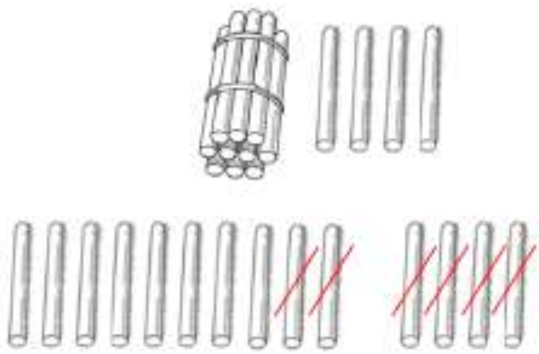
Skill: Subtract 1 and 2-digit numbers to 20





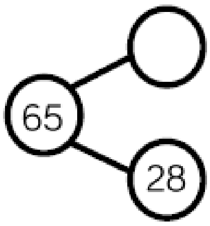
When subtracting one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.

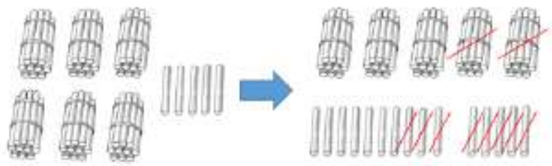
Children should be encouraged to find the number bond to 10 when partitioning the subtracted number.

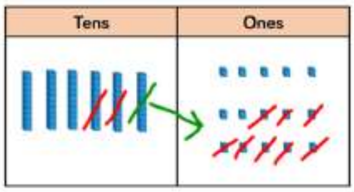


YEAR TWO

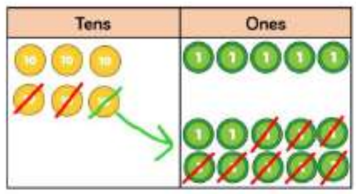
Skill: Subtract 1 and 2-digit numbers to 100







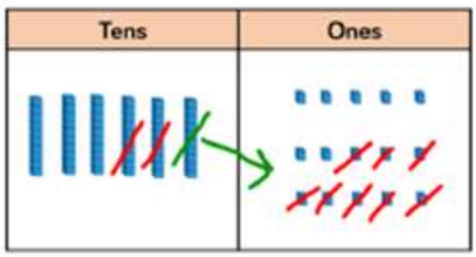
$$\begin{array}{r} {}^{5}\cancel{6}{}^{1}5 \\ -\,28 \\ \hline 37 \\ \hline \end{array}$$



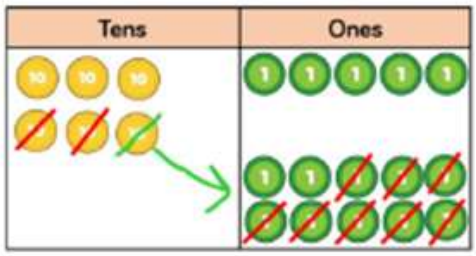
At this stage, encourage the children to use the formal written method when calculating, alongside concrete resources and pictorial representations.

Encourage efficiency by jumping multiples of 10 on a number line.

Skill: Subtract two 2-digit numbers



$$\begin{array}{r} {}^{5}\cancel{6}{}^{1}5 \\ -\,28 \\ \hline 37 \\ \hline \end{array}$$

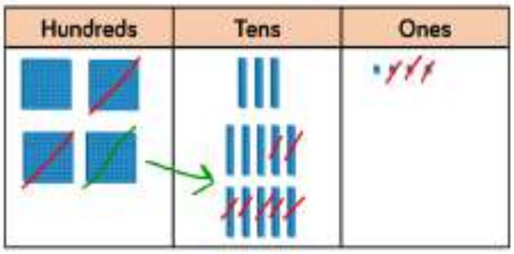


At this stage, encourage the children to use the formal written method when calculating, alongside concrete resources and pictorial representations.

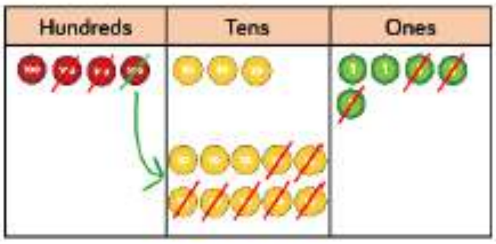
Encourage efficiency by jumping multiples of 10 on a number line.

YEAR THREE

Skill: Subtract numbers with up to 3 digits



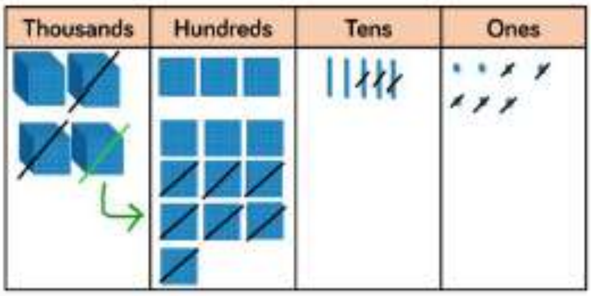
$$\begin{array}{r} {}^{3}\cancel{4}{}^{1}35 \\ -\ 273 \\ \hline 262 \\ \hline \end{array}$$

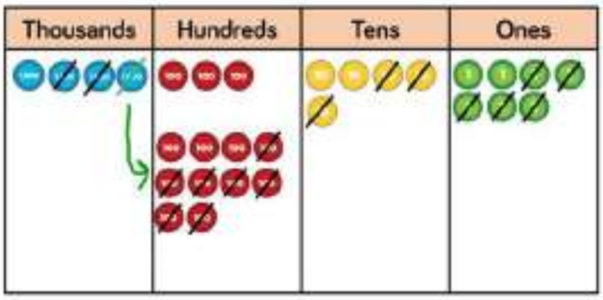


Ensure children write out their calculation alongside pictorial representations, so they can see links. Counters on a place value grid can also be beneficial to allow children to visualise.

YEAR FOUR

Skill: Subtract numbers with up to 4 digits

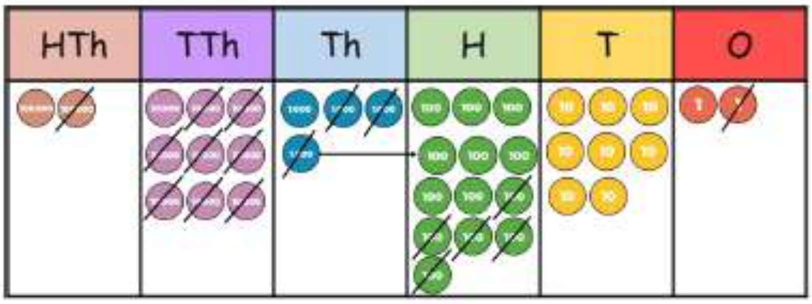




$$\begin{array}{r} {}^{3}\cancel{4}{}^{1}357 \\ -\ 2735 \\ \hline 1622 \\ \hline \end{array}$$

Ensure children write out their calculation alongside pictorial representations, so they can see links. Counters on a place value grid can also be beneficial to allow children to visualise.

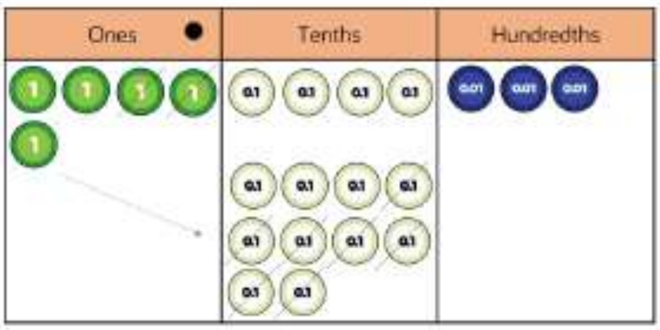
Skill: Subtract numbers with more than 4 digits

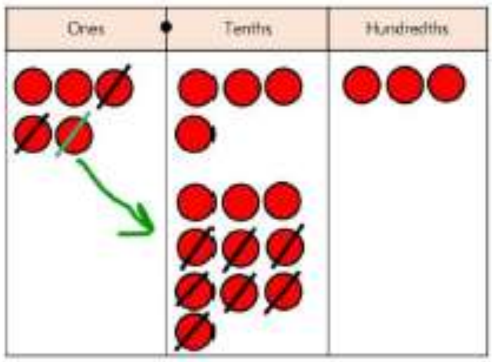


	2	9	~~4~~ 3	13	8	2
−	1	8	2	5	0	1
	1	1	1	8	8	1

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

Skill: Subtract with up to 3 decimal places



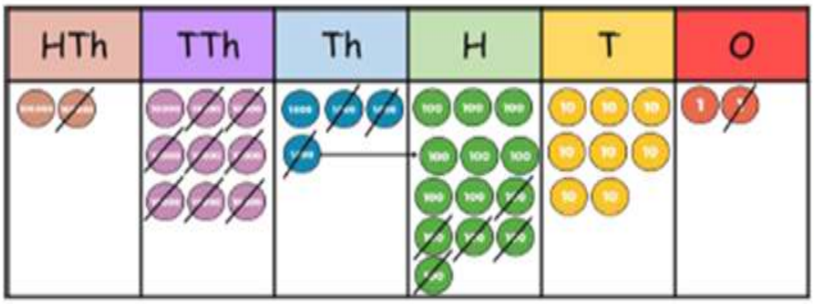


$$\begin{array}{r} {}^{4}\cancel{5}.{}^{1}43 \\ -\ 2.7 \\ \hline 2.73 \\ \hline \end{array}$$

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

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

Skill: Subtract numbers with more than 4 digits



	2	9	3 ~~4~~	13	8	2
−	1	8	2	5	0	1
	1	1	1	8	8	1

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

Glossary

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Exchange – Change a number or expression for another of an equal value.

Minuend – A quantity or number from which another is subtracted.

Partitioning – Splitting a number into its component parts.

Reduction – Subtraction as take away.

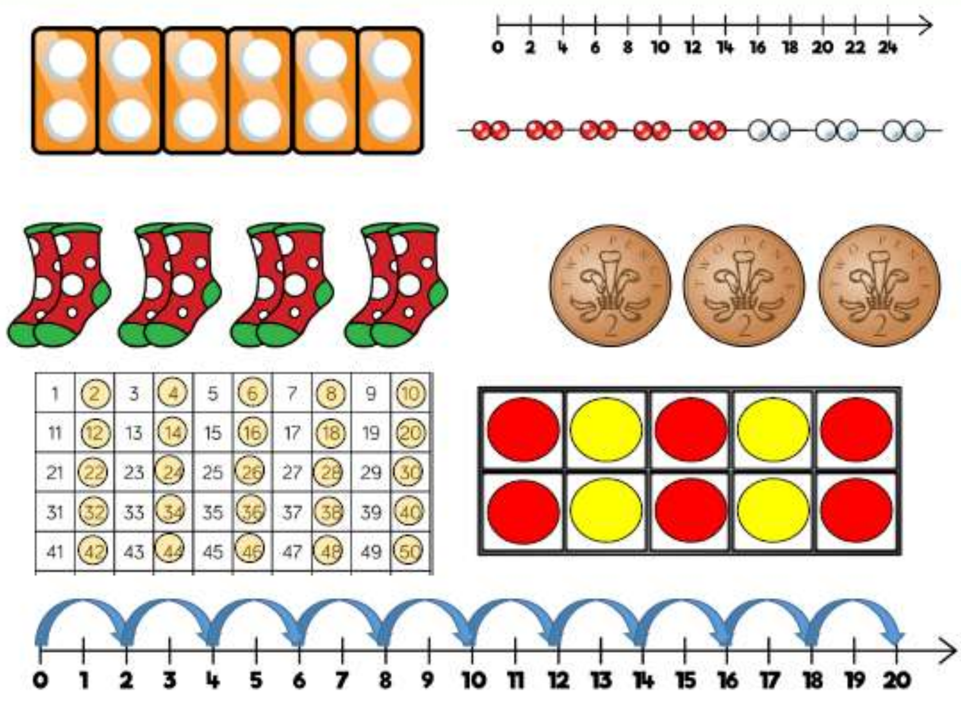
Subitise – Instantly recognise the number of objects in a small group without needing to count.

Subtrahend - A number to be subtracted from another.

Sum - The result of an addition.

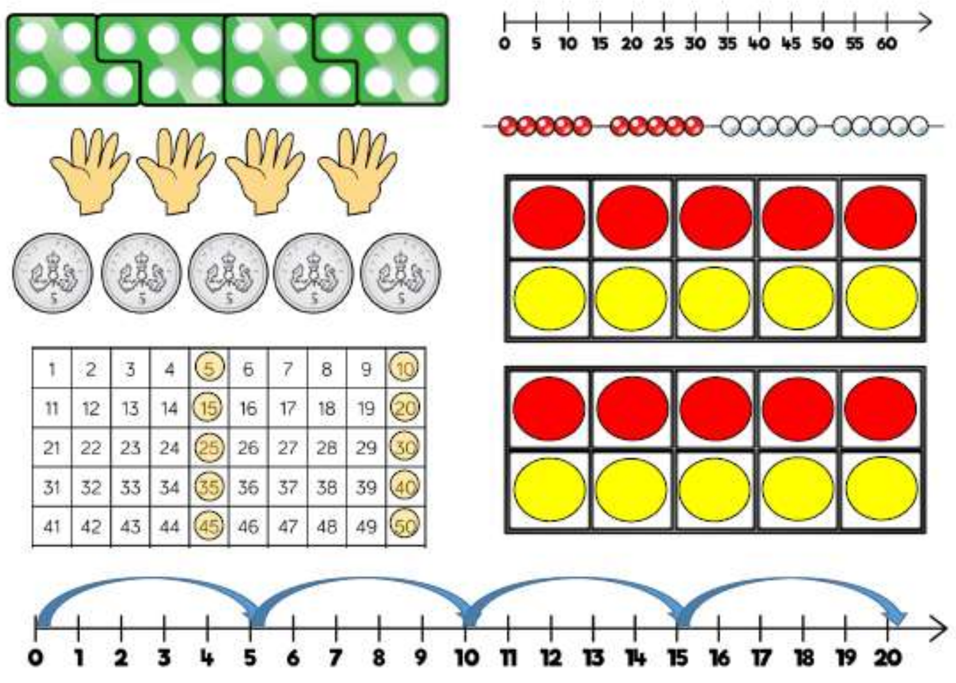
Total – The aggregate or the sum found by addition.

Times Tables

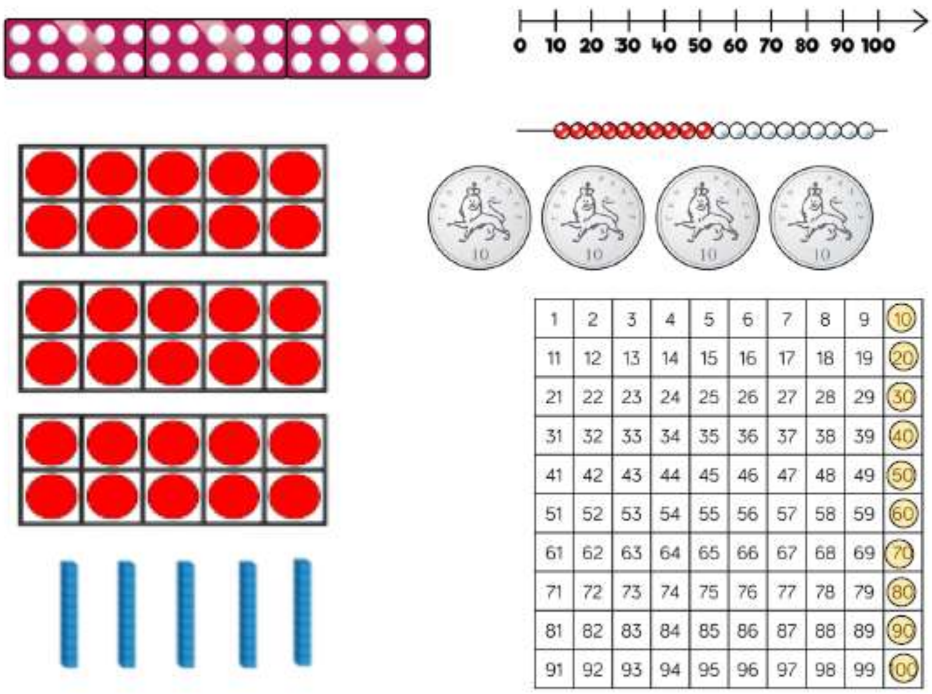
<table>
<tr><th>Skill: 2 times table</th><th>Year: 2</th></tr>
<tr><td>
</td>
<td>Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

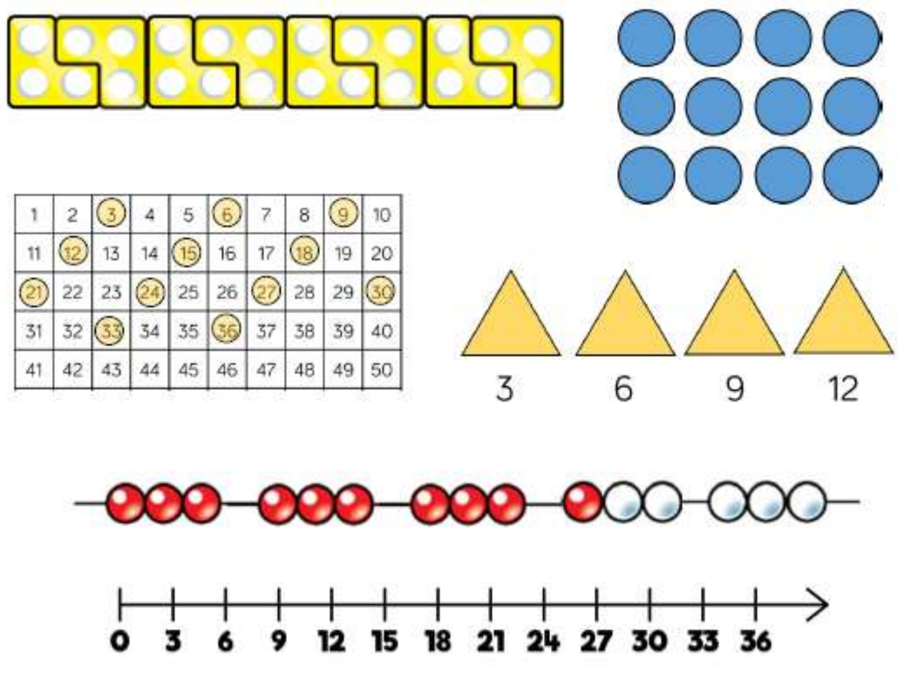
Look for patterns in the two times table, using concrete manipulatives to support. Notice how all the numbers are even and there is a pattern in the ones.

Use different models to develop fluency.</td></tr>
</table>

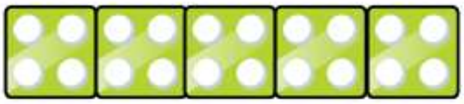
<table>
<tr><th>Skill: 5 times table</th><th>Year: 2</th></tr>
<tr><td>
</td>
<td>Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

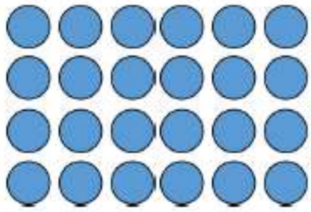
Look for patterns in the five times table, using concrete manipulatives to support. Notice the pattern in the ones as well as highlighting the odd, even, odd, even pattern.</td></tr>
</table>

Skill: 10 times table	Year: 2
	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.

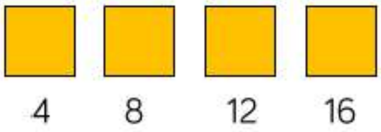
Skill: 3 times table	Year: 3
	Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the three times table, using concrete manipulatives to support. Notice the odd, even, odd, even pattern using number shapes to support. Highlight the pattern in the ones using a hundred square.

Skill: 4 times table	Year: 3

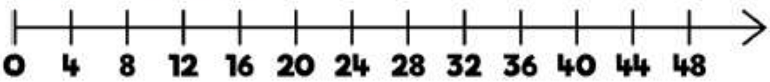




1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50



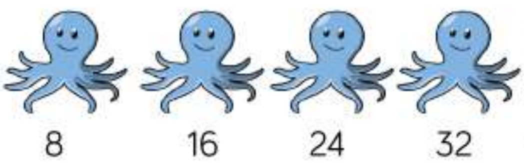
4	8	12	16	20
24	28	32	36	40
44	48	52	56	60



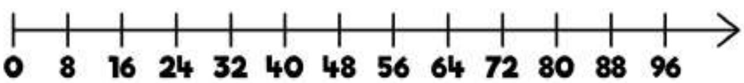
Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the four times table, using manipulatives to support. Make links to the 2 times table, seeing how each multiple is double the twos. Notice the pattern in the ones within each group of five multiples.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

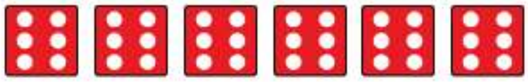


8	16	24	32	40
48	56	64	72	80



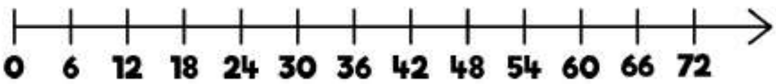
Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the eight times table, using manipulatives to support. Make links to the 4 times table, seeing how each multiple is double the fours. Notice the pattern in the ones within each group of five multiples.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

Skill: 6 times table	Year: 4



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

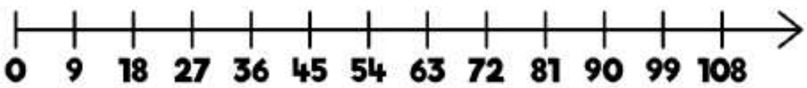


Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the six times table, using manipulatives to support. Make links to the 3 times table, seeing how each multiple is double the threes. Notice the pattern in the ones within each group of five multiples.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

Skill: 9 times table	Year: 4

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



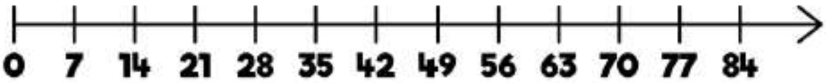
Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the nine times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using the hundred square to support as well as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



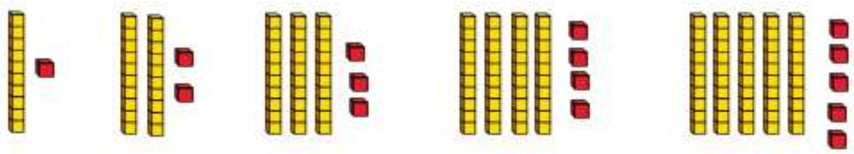
Encourage daily counting in multiples both forwards and backwards, supported by a number line or a hundred square.
The seven times table can be trickier to learn due to the lack of obvious pattern in the numbers, however they already know several facts due to commutativity.
Children can still see the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

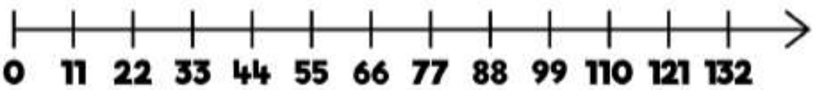
Skill: 11 times table

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





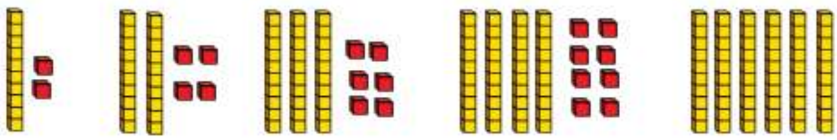
Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

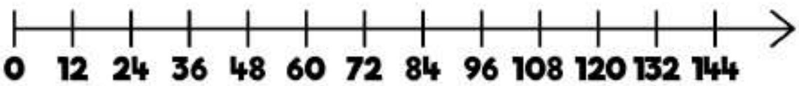
Look for patterns in the eleven times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using the hundred square to support. Also consider the pattern after crossing 100

Skill: 12 times table	Year: 4

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



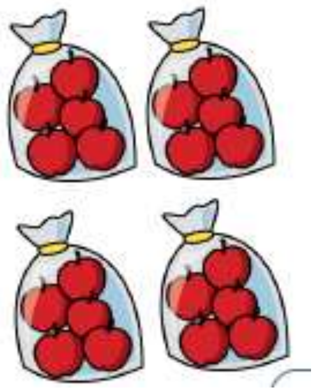


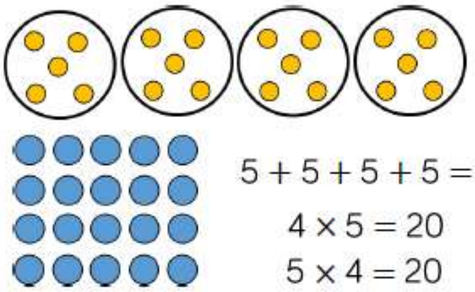
Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the 12 times table, using manipulatives to support. Make links to the 6 times table, seeing how each multiple is double the sixes. Notice the pattern in the ones within each group of five multiples.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

Multiplication

YEAR ONE AND YEAR TWO

Skill: Solve one-step problems using multiplication





$5 + 5 + 5 + 5 = 20$

$4 \times 5 = 20$

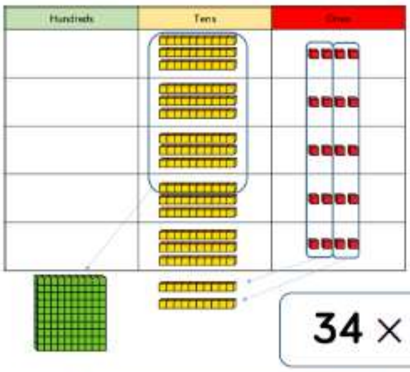
$5 \times 4 = 20$

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.

YEAR THREE

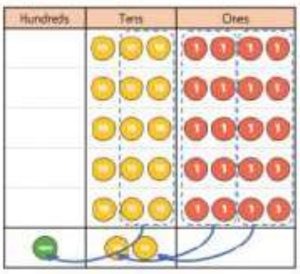
Skill: Multiply 2-digit numbers by 1-digit numbers



	H	T	O	
		3	4	
×			5	
		2	0	(5 × 4)
+	1	5	0	(5 × 30)
	1	7	0	

$34 \times 5 = 170$

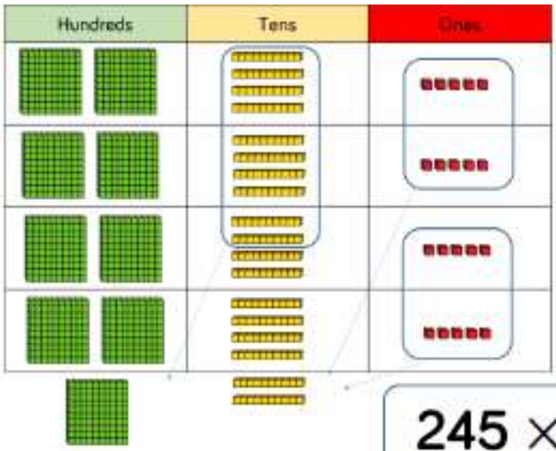
	H	T	O
		3	4
×			5
	1	7	0
	1	2	



In Year 3, it is important for the children to understand the process behind multiplication. The place value counters should support understanding of the method, rather than supporting the multiplication.

It may be beneficial to begin with introducing the expanded method before moving onto short multiplication.

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

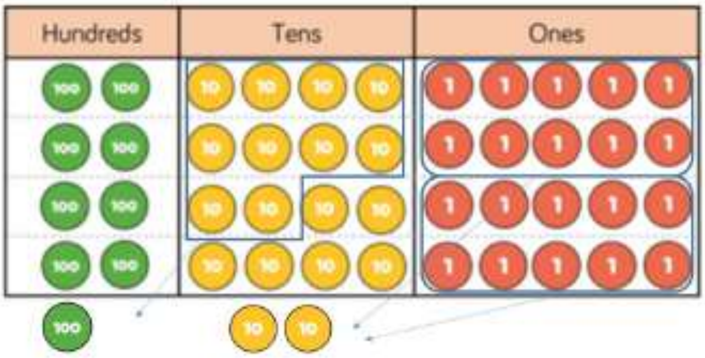


	H	T	O
	2	4	5
×			4
	9	8	0
	1	2	

$245 \times 4 = 980$

When moving onto 3 digits by 1-digit numbers, encourage the children to predominantly use the short division method. Place value counters can support the understanding of the written method.

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



YEAR FOUR

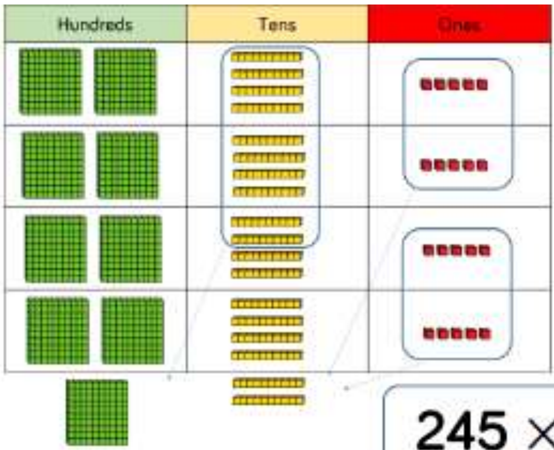
Skill: Multiply 2-digit numbers by 1-digit numbers

	H	T	O
		3	4
×			5
	1	7	0
	1	2	

In Year 4, it is important for the children to understand the process behind multiplication. The place value counters should support understanding of the method, rather than supporting the multiplication.

Predominantly use the short division method, alongside pictorial representations.

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

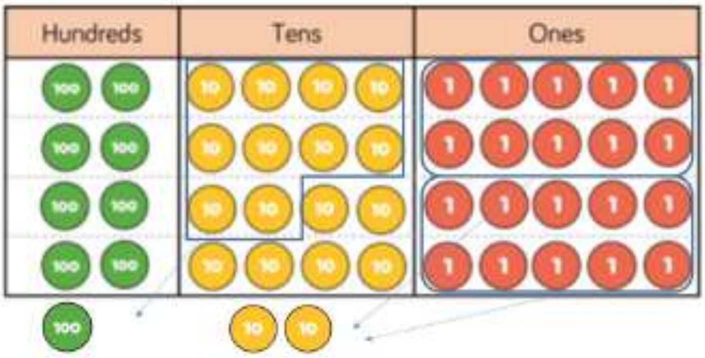


	H	T	O
	2	4	5
×			4
	9	8	0
	1	2	

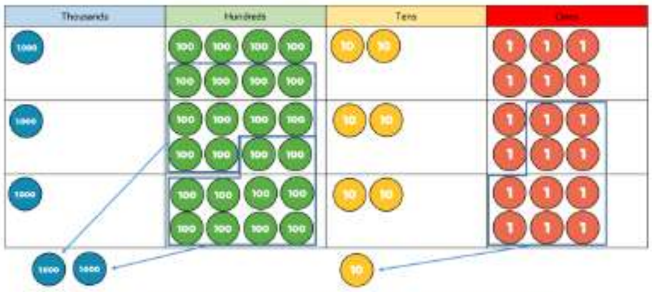
$$245 \times 4 = 980$$

When moving onto 3 digits by 1-digit numbers, encourage the children to predominantly use the short division method. Place value counters can support the understanding of the written method.

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



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



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

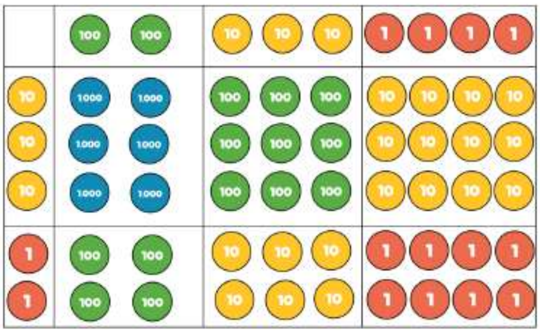
	Th	H	T	O
	1	8	2	6
×				3
	5	4	7	8
	2		1	

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 are struggling with their times tables, encourage the use of multiplication grids so children can focus on the formal written method.

At this stage, children should be using short multiplication.

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



Th	H	T	O
	2	3	4
×		3	2
	4	6	8
$_{1}7$	$_{1}0$	2	0
7	4	8	8

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

Begin by sharing the area model with the children, alongside the grid method as an initial written method before moving onto the formal written multiplication method.

Encourage the children to then move onto the formal written method of long multiplication, using the links they have already made.

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

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

When multiplying 4 digits by 2 digits, the children need to be confident with the formal written method. Consider where exchanged digits are placed, and these need to be consistent.

YEAR SIX

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

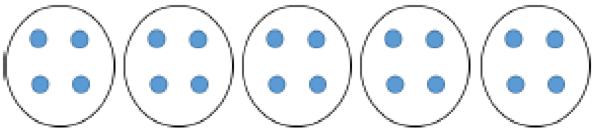
TTh	Th	H	T	O
	2	7	3	9
×			2	8
$_{2}2$	$_{5}1$	$_{3}9$	$_{7}1$	2
$_{1}5$	4	$_{1}7$	8	0
7	6	6	9	2
		1		

When multiplying 4 digits by 2 digits, the children need to be confident with the formal written method. Consider where exchanged digits are placed, and these need to be consistent.

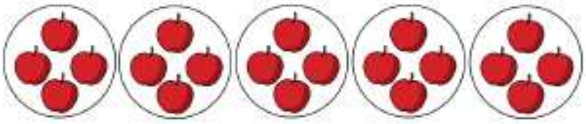
Division

YEAR ONE AND TWO

Skill: Solve 1-step problems using multiplication (sharing)



$20 \div 5 = 4$



Children to solve problems by sharing amounts into equal groups.

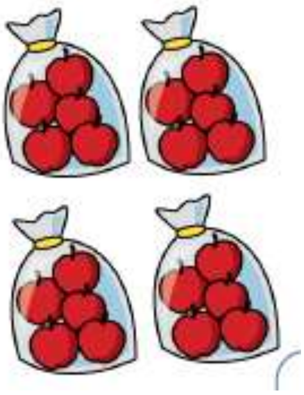
In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally.

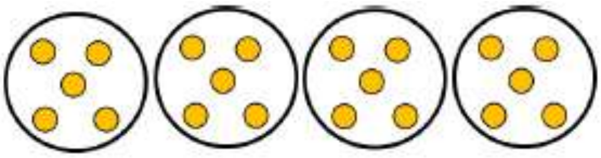
In Year 2, children are introduced to the division symbol.

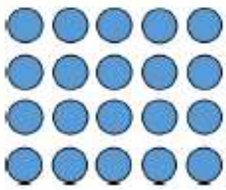
Skill: Solve 1-step problems using division (grouping)

Children solve problems by grouping and counting the number of groups. Grouping encourages the children to count in multiples.

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

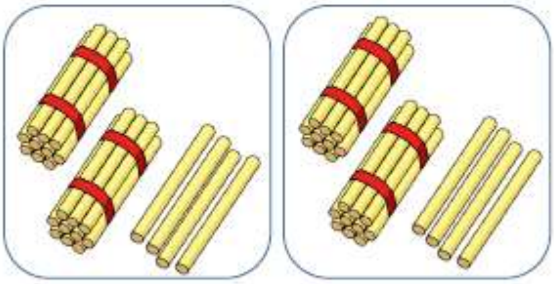


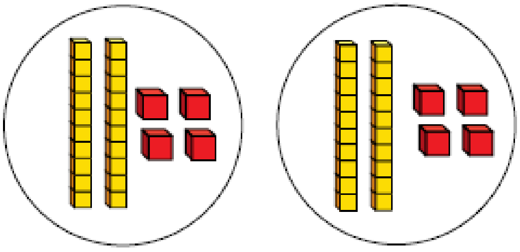




$20 \div 5 = 4$

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

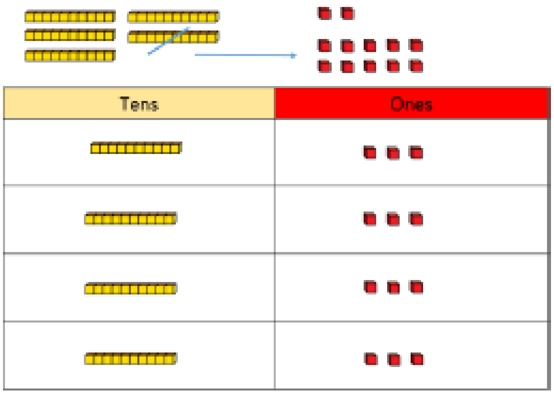


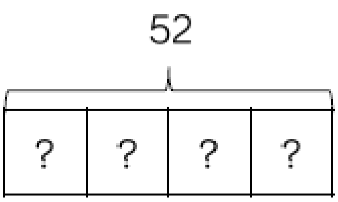


When dividing larger numbers, children can use manipulatives that allow them to partition into tens and ones.

YEAR THREE

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



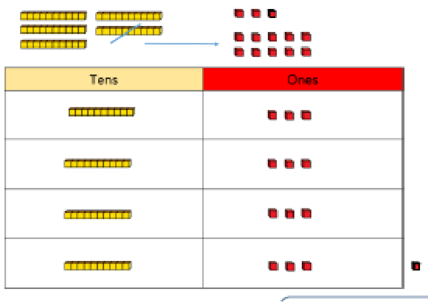


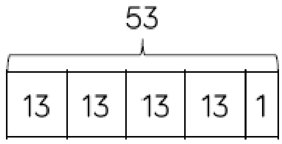
Children can use Base 10 and place value counters to exchange one ten for ten ones. Children should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows.

The bar model will allow children to see this being formally written.

YEAR THREE AND FOUR

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



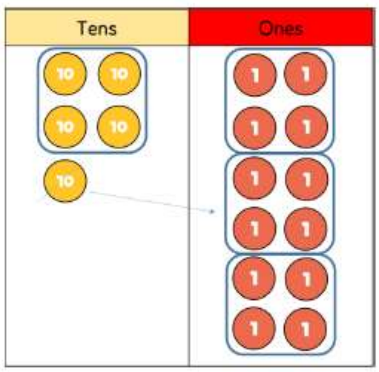


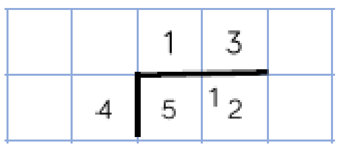
$53 \div 4 = 13\ r1$

When dividing numbers with remainders, children can use Base 10 to exchange one ten for ten ones. Starting with the equipment, the children will be able to see the one left outside the place value grid. It is important children begin to see this formally written, using the bar model and in a number sentence.

YEAR FOUR

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





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

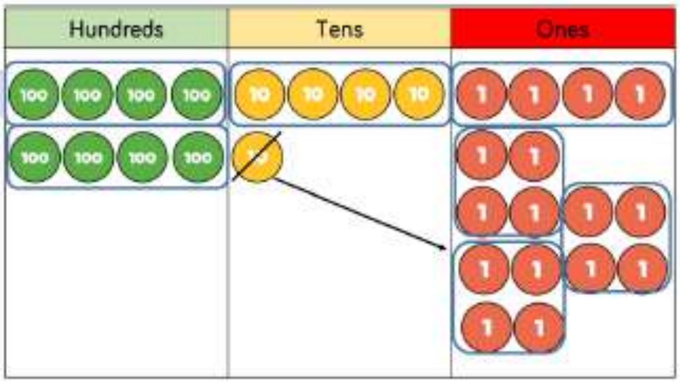
Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?'

Remainders can also be seen as they are left ungrouped.

Start using pictorial representations and move onto the formal written method if ready.

YEAR FIVE

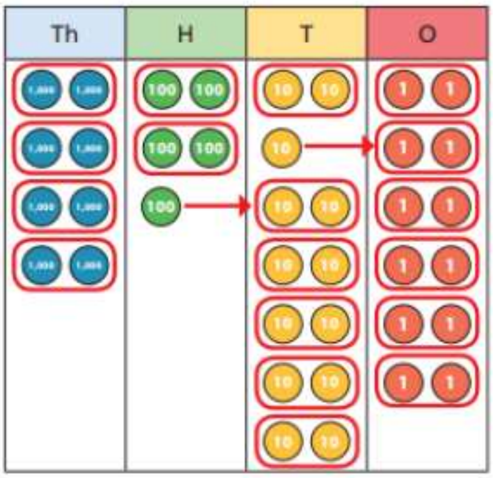
Skill: Divide 3-digits by 1-digit (grouping)



		2	1	4
	4	8	5	$^{1}6$

Children can continue to use grouping to support their understanding of short division when dividing by 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 understanding. This pictorial method can be used initially or to support emerging children, but it is imperative that all children are exposed to the formal written method by this point.

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



	4	2	6	6
2	8	5	$^{1}3$	$^{1}2$

Children can continue to use grouping to support their understanding of short division when dividing by a 4-digit number by a 1-digit number. Place value counters or plain counters can be used on a place value grid to support understanding. This pictorial method can be used initially or to support emerging children, but it is imperative that all children are exposed to the formal written method by this point.

YEAR SIX

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

		0	3	6
	12	4	$^{4}3$	$^{7}2$

$432 \div 12 = 36$

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.

To support, children can write out multiples.

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

		0	3	6	
1	2	4	3	2	(×30)
	−	3	6	0	
			7	2	(×6)
	−		7	2	
				0	

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

$432 \div 12 = 36$

Children can use long division to divide up to 4-digits by 2-digits. Children can write out multiples to support their calculations with larger remainders.

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

Glossary

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 multiplies 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