Maths

At Twin Oaks Primary School, it is our belief that all pupils should be encouraged and helped to realise their full potential in Mathematics. We want the children to see Mathematics as being relevant to their world and applicable to everyday life as well as being something that they will need as they move on through their school life and ultimately to the world of employment. To that end, we deliver a high quality, inter-related and creative Mathematics experience, in order for children to develop and embrace their ability to think mathematically.

Intent

The national curriculum for maths aims to ensure that all children:

- become fluent in the fundamentals of mathematics, including varied and frequent practice of increasingly complex mathematical tasks. So that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately,
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Implementation

At Twin Oaks Primary School, Maths is taught daily to embed strategies and build on children's prior knowledge to ensure that the children master concepts. We incorporate real-world applications of mathematics into lessons to make learning relevant and engaging. We support children to learn together through collaboration and discussion and we use targeted support and scaffolding to make the learning as clear and accessible as possible. We actively avoid unnecessarily elaborate or differentiated approaches although some learners with high levels of special educational needs and/or disabilities (SEND) may need to work on a curriculum that whilst differentiated is still ambitious. We encourage all children to be ambitious in setting high expectations for their mathematical growth in line with our school values.

White Rose

All of our teachers plan with White Rose schemes of learning to ensure our children are engaging with lessons that are influenced, inspired and informed by the work of leading maths researchers and practitioners and that our curriculum is coherently sequenced. Our teachers refine, build on and augment these plans using their own subject knowledge, their knowledge of their pupils and other high-quality planning resources including those produced by the NCETM and NRICH. Teachers utilise a variety of teaching methods, including hands-on activities, group work, technology integration and peer tutoring.

Teaching for Mastery

We are working with the NCETM Maths networks to develop a teaching for mastery approach to mathematics. We take a Maths Mastery approach to teaching and learning and are committed to developing subject knowledge and pedagogy around the subject.

“Mastering maths means pupils of all ages acquiring a deep, long-term, secure and adaptable understanding of the subject. The phrase ‘teaching for mastery’ describes the elements of classroom practice and school organisation that combine to give pupils the best chances of mastering maths. Achieving mastery means acquiring a solid enough understanding of the maths that’s been taught to enable pupils to move on to more advanced material.”

Numberblocks

Numberblocks episodes are produced in consultation with NCETM Director for Primary Debbie Morgan. Along with the associated planning resources these episodes are an important part of how we teach early maths. In EYFS and KS1 we use Numberblocks to highlight and develop the key mathematical ideas that are embedded in the programmes. Our teachers use these episodes as a launchpad, confidently moving on from an episode and helping children to bring the numbers and ideas to life in the world around them.

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

Times Tables Rock Stars

Times Tables Rock Stars is an online learning platform designed to help students improve their multiplication and division skills. It is a carefully sequenced programme of daily times tables practice. Each week concentrates on a different times table, with a recommended consolidation week for rehearsing the tables that have recently been practised every third week or so. This format has very successfully boosted times tables recall speed for hundreds of thousands of pupils over the last 8 years in over 16,000 schools - both primary and secondary – worldwide.

Students can log in to the platform individually (at home or at school) to practice their multiplication and division tables. They work on answering math questions in a game-like format that includes timed challenges, rewards for progress and the opportunity to compete with classmates. Teachers have access to children's accounts where they can set up levels and difficulty settings for children based on their skill levels. This ensures that children are working on problems that are appropriate for their abilities and enables teachers to track progress. Parents are encouraged to support their children to access this platform daily.

https://ttrockstars.com/

Fluency

According to the National Curriculum (2013) children should 'become fluent in the fundamentals of mathematics, including through varied and frequent practice, so that pupils develop conceptual understanding and recall and apply knowledge.'

In order to achieve this, we have a Whole School approach to the teaching and learning of Times Tables. This approach focusses on 36 key facts that are used to ensure children learn these important facts in a coherent way that builds on a deep and embedded understanding of the associated mathematical structures. This ensures that our children are adequately prepared for the Multiplication Tables Check.

1 × 1	1 × 2	1 × 3	1 × 4	1 × 5	1 × 6	1 × 7	1 × 8	1 × 9	1 × 10	1 × 11	1 × 12
2 × 1	2 × 2	2 × 3	2 × 4	2 × 5	2 × 6	2 × 7	2 × 8	2 × 9	2 × 10	2 × 11	2 × 12
3 × 1	3 × 2	3 × 3	3 × 4	3 × 5	3 × 6	3 × 7	3 × 8	3 × 9	3 × 10	3 × 11	3 × 12
4 × 1	4 × 2	4 × 3	4 × 4	4 × 5	4 × 6	4 × 7	4 × 8	4 × 9	4 × 10	4 × 11	4 × 12
5 × 1	5 × 2	5 × 3	5 × 4	5 × 5	5 × 6	5 × 7	5 × 8	5 × 9	5 × 10	5 × 11	5 × 12
6 × 1	6 × 2	6 × 3	6 × 4	6 × 5	6 × 6	6 × 7	6 × 8	6 × 9	6 × 10	6 × 11	6 × 12
7 × 1	7 × 2	7 × 3	7 × 4	7 × 5	7 × 6	7 × 7	7 × 8	7 × 9	7 × 10	7 × 11	7 × 12
8 × 1	8 × 2	8 × 3	8 × 4	8 × 5	8 × 6	8 × 7	8 × 8	8 × 9	8 × 10	8 × 11	8 × 12
9 × 1	9 × 2	9 × 3	9 × 4	9 × 5	9 × 6	9 × 7	9 × 8	9 × 9	9 × 10	9 × 11	9 × 12
10 × 1	10 × 2	10 × 3	10 × 4	10 × 5	10 × 6	10 × 7	10 × 8	10 × 9	10 × 10	10 × 11	10 × 12
11 × 1	11 × 2	11 × 3	11 × 4	11 × 5	11 × 6	11 × 7	11 × 8	11 × 9	11 × 10	11 × 11	11 × 12
12 × 1	12 × 2	12 × 3	12 × 4	12 × 5	12 × 6	12 × 7	12 × 8	12 × 9	12 × 10	12 × 11	12 × 12

The 36 key multiplication facts

At Twin Oaks Primary School, we believe that daily practice is crucial for building and maintaining fluency therefore teachers from Year 1 to Year 6, deliver ten minutes of targeted fluency practice every day. Maths fluency practice involves revision of mathematical topics, including addition, subtraction, multiplication, division, fractions, decimals and more. An element of challenge is added through timed exercises which help to boost speed and accuracy.

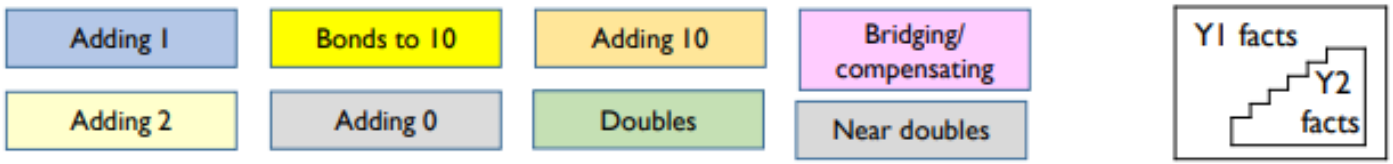
Fluently add and subtract within 10 for Year 1

The table below represents the 66 addition facts within 10. Children are expected to be able to add and subtract within 10 by the end of year 1.

+	0	1	2	3	4	5	6	7	8	9	10
0	0+0	0+1	0+2	0+3	0+4	0+5	0+6	0+7	0+8	0+9	0+10
1	1+0	1+1	1+2	1+3	1+4	1+5	1+6	1+7	1+8	1+9	
2	2+0	2+1	2+2	2+3	2+4	2+5	2+6	2+7	2+8		
3	3+0	3+1	3+2	3+3	3+4	3+5	3+6	3+7			
4	4+0	4+1	4+2	4+3	4+4	4+5	4+6				
5	5+0	5+1	5+2	5+3	5+4	5+5					
6	6+0	6+1	6+2	6+3	6+4						
7	7+0	7+1	7+2	7+3							
8	8+0	8+1	8+2								
9	9+0	9+1									
10	10+0										

Fluently add and subtract within and across 10

In year 2, pupils learnt strategies for addition and subtraction across 10. However, year 3 pupils are likely to need further practice, and reminders of the strategies, to develop sufficient fluency. Pupils should practise until they achieve automaticity in the mental application of these strategies.



+	0	1	2	3	4	5	6	7	8	9	10
0	0 + 0	0 + 1	0 + 2	0 + 3	0 + 4	0 + 5	0 + 6	0 + 7	0 + 8	0 + 9	0 + 10
1	1 + 0	1 + 1	1 + 2	1 + 3	1 + 4	1 + 5	1 + 6	1 + 7	1 + 8	1 + 9	1 + 10
2	2 + 0	2 + 1	2 + 2	2 + 3	2 + 4	2 + 5	2 + 6	2 + 7	2 + 8	2 + 9	2 + 10
3	3 + 0	3 + 1	3 + 2	3 + 3	3 + 4	3 + 5	3 + 6	3 + 7	3 + 8	3 + 9	3 + 10
4	4 + 0	4 + 1	4 + 2	4 + 3	4 + 4	4 + 5	4 + 6	4 + 7	4 + 8	4 + 9	4 + 10
5	5 + 0	5 + 1	5 + 2	5 + 3	5 + 4	5 + 5	5 + 6	5 + 7	5 + 8	5 + 9	5 + 10
6	6 + 0	6 + 1	6 + 2	6 + 3	6 + 4	6 + 5	6 + 6	6 + 7	6 + 8	6 + 9	6 + 10
7	7 + 0	7 + 1	7 + 2	7 + 3	7 + 4	7 + 5	7 + 6	7 + 7	7 + 8	7 + 9	7 + 10
8	8 + 0	8 + 1	8 + 2	8 + 3	8 + 4	8 + 5	8 + 6	8 + 7	8 + 8	8 + 9	8 + 10
9	9 + 0	9 + 1	9 + 2	9 + 3	9 + 4	9 + 5	9 + 6	9 + 7	9 + 8	9 + 9	9 + 10
10	10 + 0	10 + 1	10 + 2	10 + 3	10 + 4	10 + 5	10 + 6	10 + 7	10 + 8	10 + 9	10 + 10

Whole School Progression Map for Fluency in Number Facts

<table>
<tr><th></th><th colspan="2">Aut 1</th><th colspan="2">Aut 2</th><th colspan="2">Spr 1</th><th colspan="2">Spr 2</th><th>Sum 1</th><th>Sum 2</th></tr>
<tr><td>Year 1</td><td>Step 1
2+1
3+1
4+1
5+1
6+1
7+1
8+1</td><td>Step 2
1+1
2+2
3+3
4+4
5+5
4+3
5+4
10+10</td><td>Step 3
3+2
4+2
5+2
6+2
7+2
9+2</td><td>Step 4
4+6
3+7
2+8
1+9
0+10</td><td>Step 5
0+0
1+0
2+0
3+0
4+0
5+0
6+0
7+0
8+0
9+0</td><td>Step 6
1+10
2+10
3+10
4+10
5+10
6+10
7+10
8+10
9+10</td><td colspan="2">Step 7
5+3
6+3

Consolidate Steps 1-7

Counting in 1s, 2s, 5s and 10s</td><td>Consolidate Steps 1-7

Counting in 1s, 2s, 5s and 10s</td><td>Consolidate Steps 1-7

Counting in 1s, 2s, 5s and 10s</td></tr>
<tr><td>Year 2</td><td colspan="2">Step 8
6+6
7+7
8+8
9+9

Counting in 1s, 2s, 5s and 10s</td><td>Step 9
5+6
6+7
7+8
8+9</td><td>Multiplication and Division facts for 1s (up to 12th multiple)</td><td>Step 10
3+8
3+9
4+7
4+8
4+9</td><td>Multiplication and Division facts for 2s (up to 12th multiple)</td><td>Step 10
5+7
5+8
5+9
6+8
5+9
7+9</td><td>Multiplication and Division facts for 10s (up to 12th multiple)</td><td>Multiplication and Division facts for 5s (up to 12th multiple)

Multiplication and Division facts for 2s (up to 12th multiple)</td><td>Multiplication and Division facts for 0

Consolidate multiplication and division facts for 2s, 5s and 10s (up to 12th multiple)</td></tr>
<tr><td rowspan="2">Year 3</td><td colspan="2">Secure and maintain fluency in addition and subtraction within and across 10, through continued practice.</td><td colspan="2">Secure and maintain fluency in addition and subtraction within and across 10, through continued practice.</td><td colspan="2">Secure and maintain fluency in addition and subtraction within and across 10, through continued practice.</td><td colspan="2">Secure and maintain fluency in addition and subtraction within and across 10, through continued practice.</td><td>Secure and maintain fluency in addition and subtraction within and across 10, through continued practice.</td><td>Secure and maintain fluency in addition and subtraction within and across 10, through continued practice.</td></tr>
<tr><td colspan="2">Multiplication and Division facts for (2s and) 4s
(up to 12th multiple)</td><td colspan="2">Multiplication and Division facts for 4s (up to 12th multiple)</td><td colspan="2">Multiplication and Division facts for (4s and) 8s
(up to 12th multiple)</td><td colspan="2">Multiplication and Division facts for 8s (up to 12th multiple)</td><td colspan="2">Revision of multiplication and division facts for 2s, 4s, 5s, 8s and 10s</td></tr>
</table>

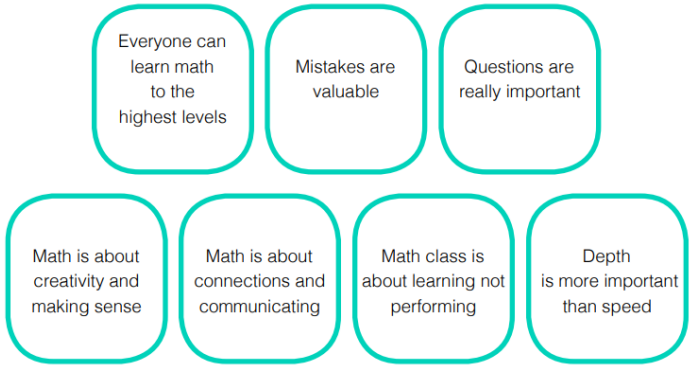
	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
Year 4	Multiplication and Division facts for 3s (up to 12th multiple) 3x3 6x3 7x3 9x3 11x3 12x3	Multiplication and Division facts for (3s and) 6s (up to 12th multiple) 6x6 7x6 9x6 11x6 12x6	Multiplication and Division facts for 6s (up to 12th multiple)	Multiplication and Division facts for (3s and) 9s (up to 12th multiple) 9x9 11x9 12x9	Multiplication and Division facts for 7s (up to 12th multiple) 7x7 11x7 12x7	Multiplication and Division facts for up to 12x12
Year 5	Multiplication and Division facts for 4s and 8s (up to 12th multiple)	Multiplication and Division facts for 3s and 6s (up to 12th multiple)	Multiplication and Division facts for 9s and 12s (up to 12th multiple)	Multiplication and Division facts for 7s and 11s (up to 12th multiple)	Square numbers	Multiplication and Division facts for up to 12x12
Year 6	Multiplication and Division facts for 4s and 8s (up to 12th multiple)	Multiplication and Division facts for 3s and 6s (up to 12th multiple)	Multiplication and Division facts for 9s and 12s (up to 12th multiple)	Multiplication and Division facts for 7s and 11s (up to 12th multiple)	Square numbers	Multiplication and Division facts for up to 12x12

Impact

As well as expecting our children to achieve academic success we expect them to also develop positive mathematical mindsets to ensure they continue to learn and achieve throughout their formal education and beyond.

We are committed to developing mathematicians who:

- understand that everyone can learn maths to high levels
- believe in themselves and know that this changes what they can do
- know that maths is about creativity and making sense of the world
- value mistakes and challenges because they know that they support brain growth
- engage with questions and discussions to deepen their mathematical understanding
- visualise their learning and make connections to deepen their understanding
- recognise that depth of understanding is more important than speed
- talk articulately using mathematical language, vocabulary and about the context in which Maths is taught.
- show a high level of pride and enthusiasm for their learning.



Based on Maths Class Norms from Stanford Professor Jo Boaler's YouCubed Website)

https://www.youcubed.org/?s=positive+classroom+norms

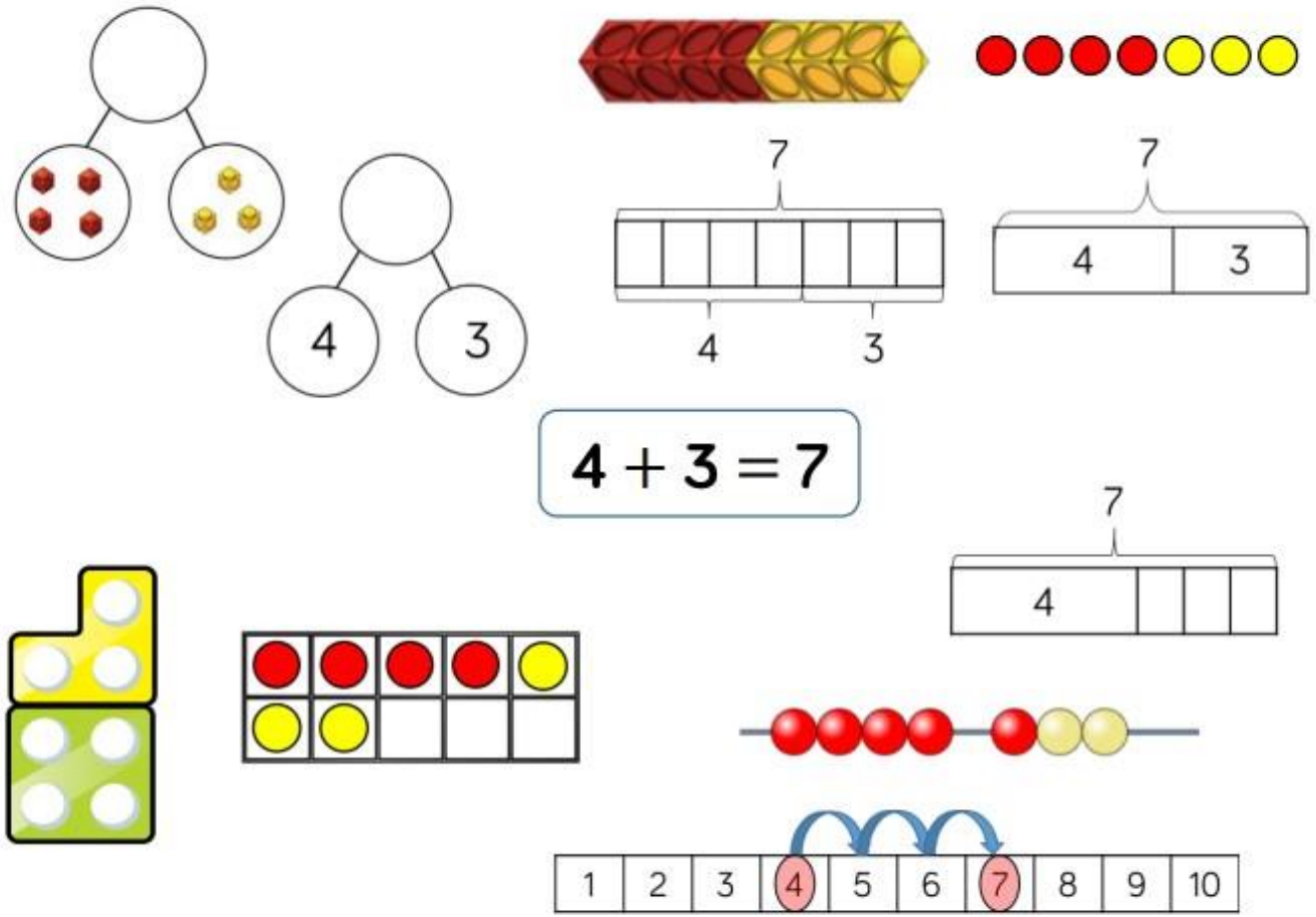
https://www.youcubed.org/evidence/fluency-without-fear/

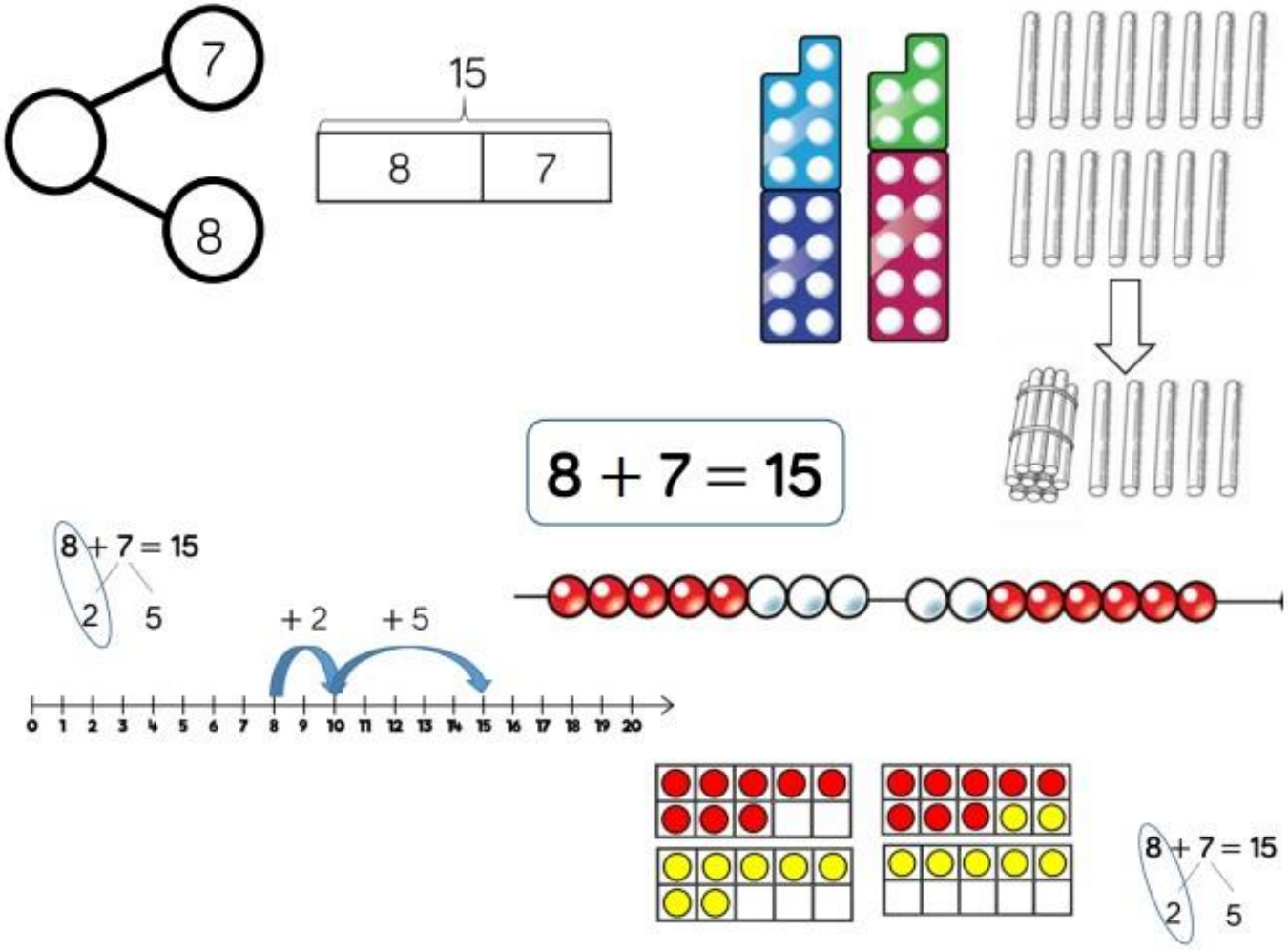
Calculation policy: Guidance

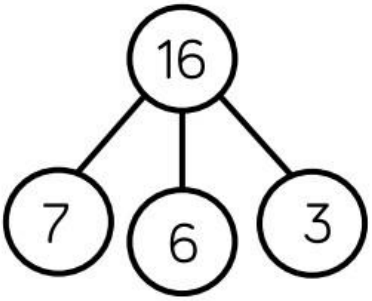
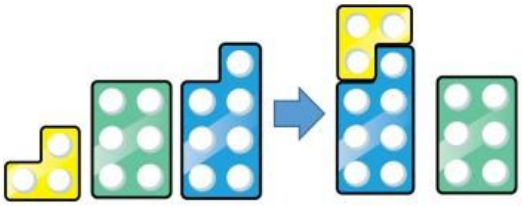
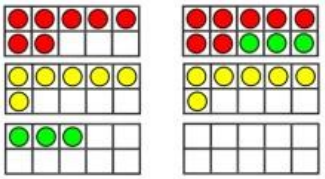
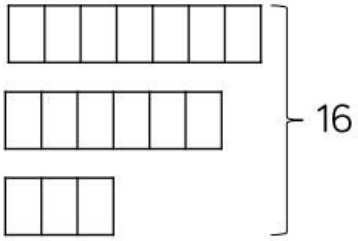
	EYFS/Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition	Combining two parts to make a whole: part whole model. Starting at the bigger number and counting on- using cubes. Regrouping to make 10 using ten frame.	Adding three single digits. Use of base 10 to combine two numbers.	Column method- regrouping. Using place value counters (up to 3 digits).	Column method- regrouping. (up to 4 digits)	Column method- regrouping. Use of place value counters for adding decimals.	Column method- regrouping. Abstract methods. Place value counters to be used for adding decimal numbers.
Subtraction	Taking away ones Counting back Find the difference Part whole model Make 10 using the ten frame	Counting back Find the difference Part whole model Make 10 Use of base 10	Column method with regrouping. (up to 3 digits using place value counters)	Column method with regrouping. (up to 4 digits)	Column method with regrouping. Abstract for whole numbers. Start with place value counters for decimals- with the same amount of decimal places.	Column method with regrouping. Abstract methods. Place value counters for decimals- with different amounts of decimal places.

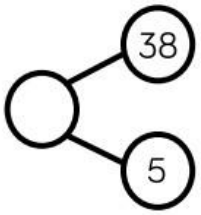
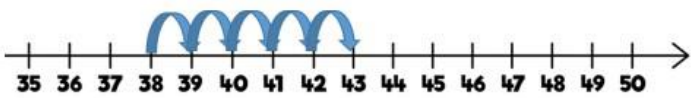
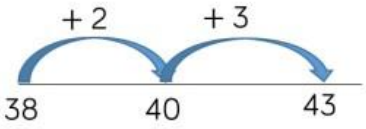
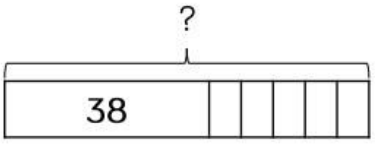
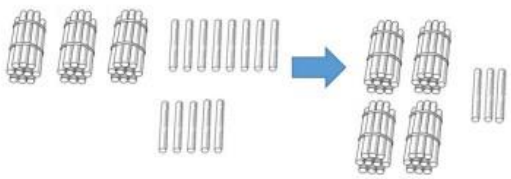
Multiplication	Recognising and making equal groups. Doubling Counting in multiples Use cubes, Numicon and other objects in the classroom	Arrays- showing commutative multiplication	Arrays 2d × 1d using base 10	Column multiplication- introduced with place value counters. (2 and 3 digit multiplied by 1 digit)	Column multiplicatio n Abstract only but might need a repeat of year 4 first(up to 4 digit numbers multiplied by 1 or 2 digits)	Column multiplicatio n Abstract methods (multi-digit up to 4 digits by a 2 digit number)
Division	Sharing objects into groups Division as grouping e.g. I have 12 sweets and put them in groups of 3, how many groups? Use cubes and draw round 3 cubes at a time.	Division as grouping Division within arrays- linking to multiplication Repeated subtractio n	Division with a remainder-using lollipop sticks, times tables facts and repeated subtraction. 2d divided by 1d using base 10 or place value counters	Division with a remainder Short division (up to 3 digits by 1 digit- concrete and pictorial)	Short division (up to 4 digits by a 1 digit number including remainders)	Short division Long division with place value counters (up to 4 digits by a 2 digit number) Children should exchange into the tenths and hundredths column too

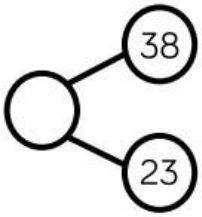
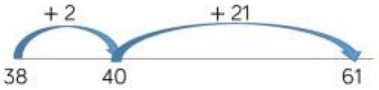
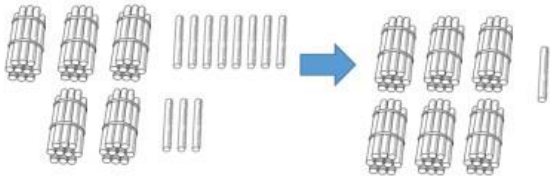
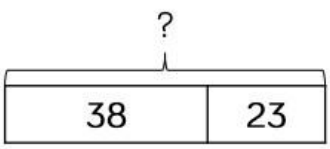
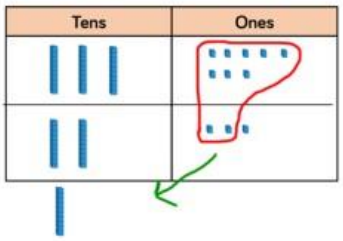
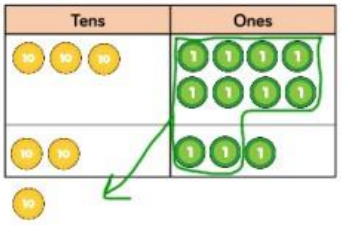
Addition

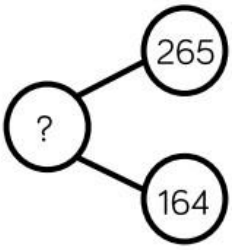
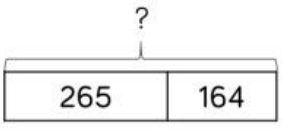
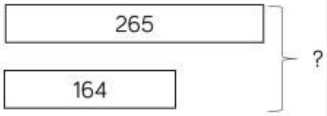
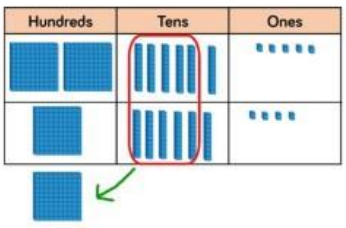
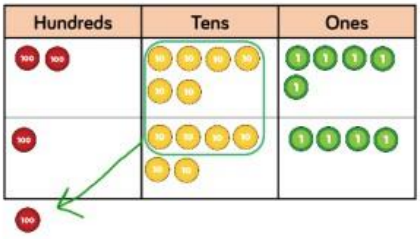
Skill: Add 1-digit numbers within 10	Year: 1
	When adding numbers to 10, children can explore both aggregation and augmentation. The part-whole model, discrete and continuous bar model, number shapes and ten frame support aggregation. The combination bar model, ten frame, bead string and number track all support augmentation.

Skill: Add 1 and 2-digit numbers to 20	Year: 1/2
	When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten. Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support children in understanding how to partition their jumps.

Skill: Add three 1-digit numbers	Year: 2
  $7 + 6 + 3 = 16$  $7 + 6 + 3 = 16$ 10 	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.

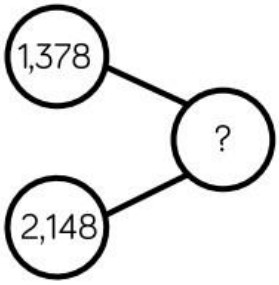
Skill: Add 1-digit and 2-digit numbers to 100	Year: 2/3
    $38 + 5 = 43$  	When adding single digits to a two-digit number, children should be encouraged to count on from the larger number. They should also apply their knowledge of number bonds to add more efficiently e.g. $8 + 5 = 13$ so $38 + 5 = 43$. Hundred squares and straws can support children to find the number bond to 10.

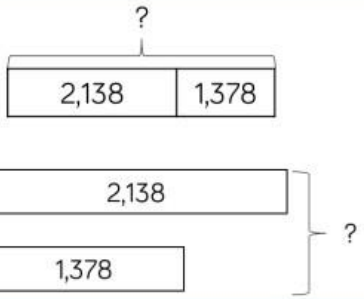
Skill: Add two 2-digit numbers to 100	Year: 2/3
    **38 + 23 = 61**  38 + 23 61 1 	At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient. Children can also use a blank number line to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient.

Skill: Add numbers with up to 3 digits	Year: 3
   **265 + 164 = 429**  265 + 164 429 1 	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

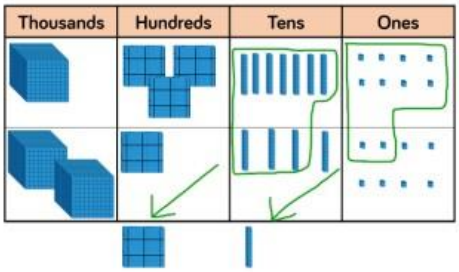
Year: 4

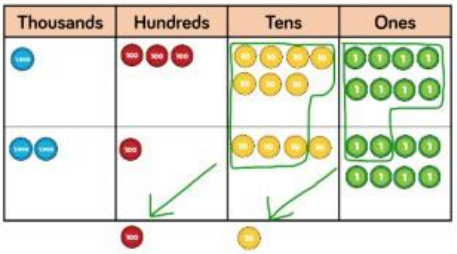




	1	3	7	8
+	2	1	4	8
	3	5	2	6
	1	1		

1,378 + 2,148 = 3,526





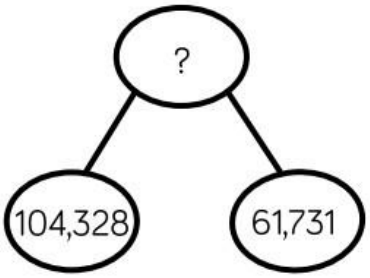
Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 4 digits.

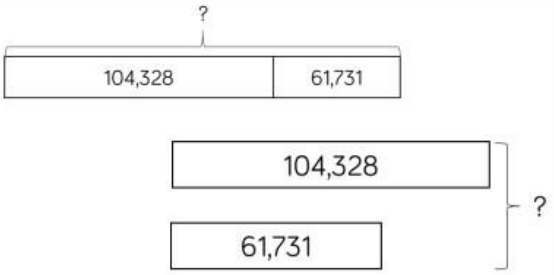
Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

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

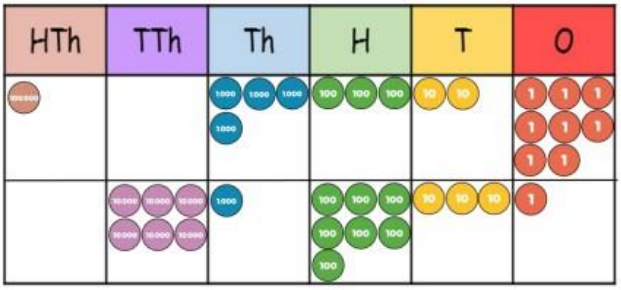
Skill: Add numbers with more than 4 digits

Year: 5/6





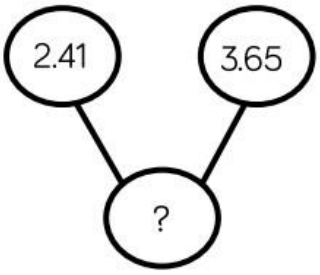
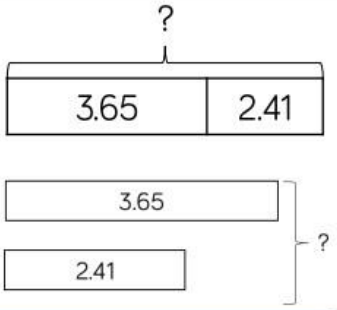
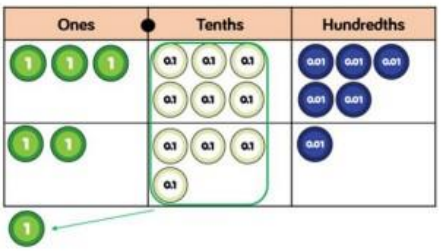
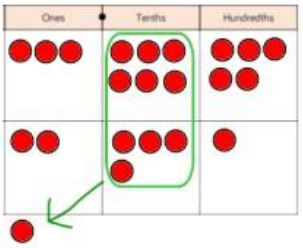
104,328 + 61,731 = 166,059



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

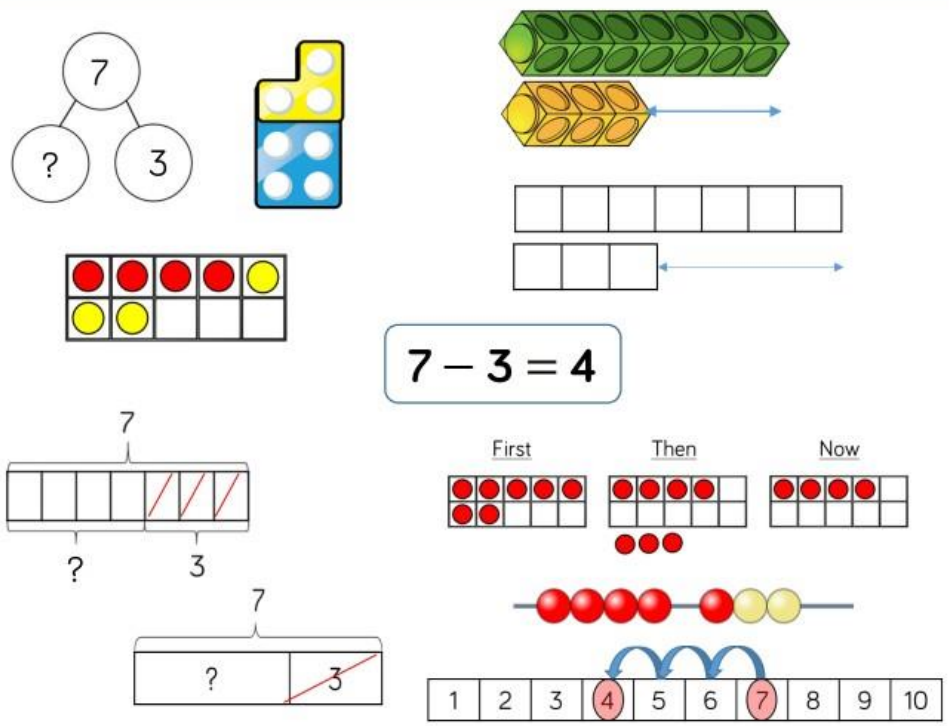
Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.

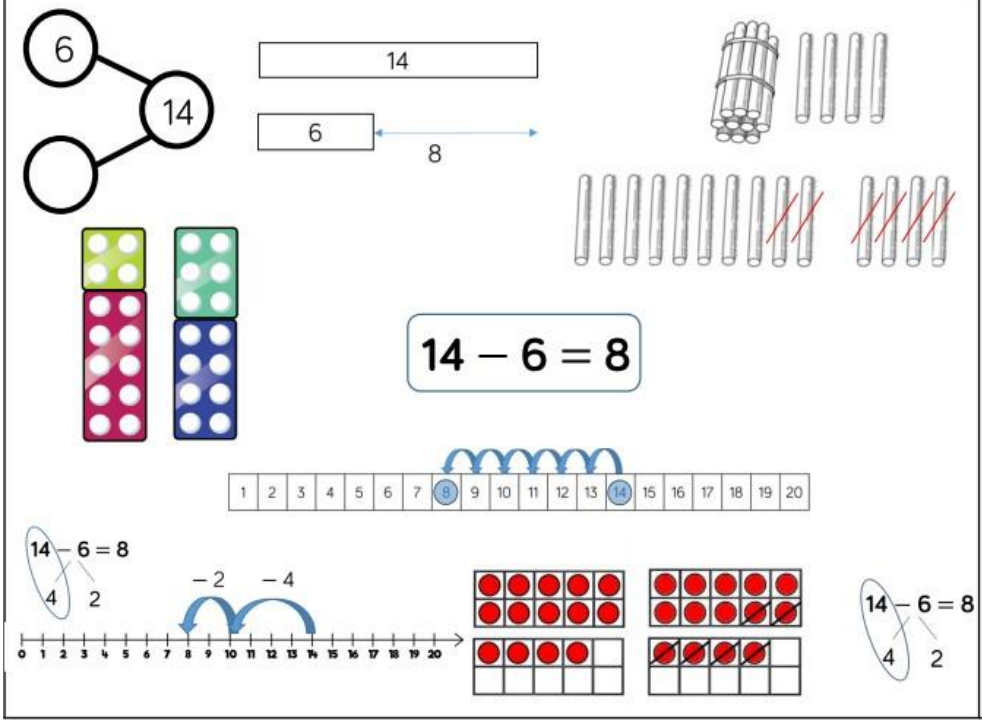
At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.

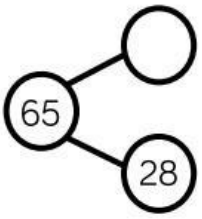
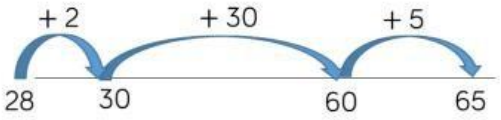
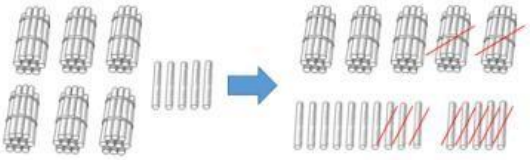
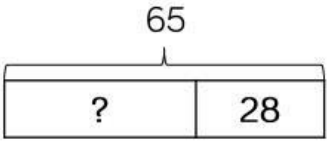
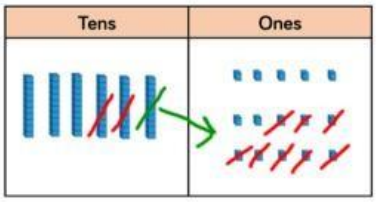
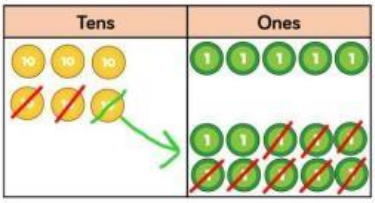
Skill: Add with up to 3 decimal places	Year: 5
  $3.65 + 2.41 = 6.06$  	Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1, 2 and then 3 decimal places. Ensure children have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other measures.

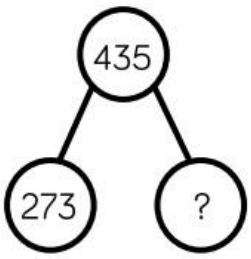
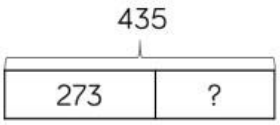
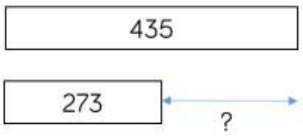
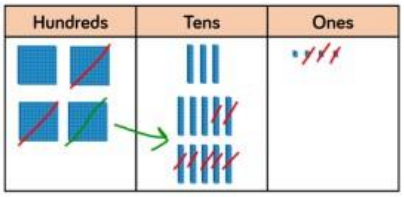
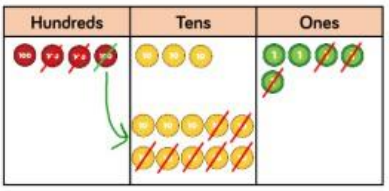
$$\begin{array}{r} 3.65 \\ +\ 2.41 \\ \hline 6.06 \\ \hline 1 \end{array}$$

Subtraction

Skill: Subtract 1-digit numbers within 10	Year: 1
	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.

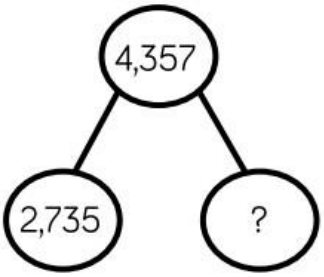
Skill: Subtract 1 and 2-digit numbers to 20	Year: 1/2
	When subtracting one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten. Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this.

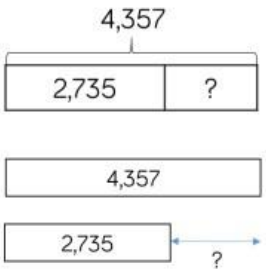
Skill: Subtract 1 and 2-digit numbers to 100	Year: 2
    $65 - 28 = 37$  $\begin{array}{r} {}^{5}\not{6}\,{}^{1}\not{5} \\ -\ 2\ 8 \\ \hline 3\ 7 \end{array}$ 	At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient. Children can also use a blank number line to count on to find the difference. Encourage them to jump to multiples of 10 to become more efficient.

Skill: Subtract numbers with up to 3 digits	Year: 3
   $435 - 273 = 262$  $\begin{array}{r} {}^{3}\not{4}\,{}^{1}\not{3}\,5 \\ -\ 2\ 7\ 3 \\ \hline 2\ 6\ 2 \end{array}$ 	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

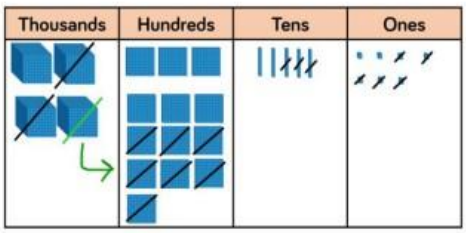
Year: 4

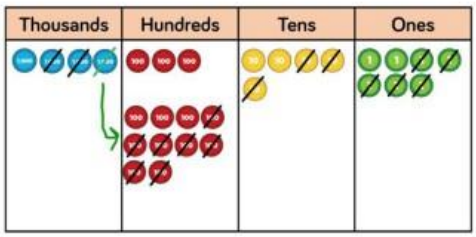




$$\begin{array}{r} {}^{3}\cancel{4}\,{}^{1}357 \\ -\ 2735 \\ \hline 1622 \end{array}$$

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





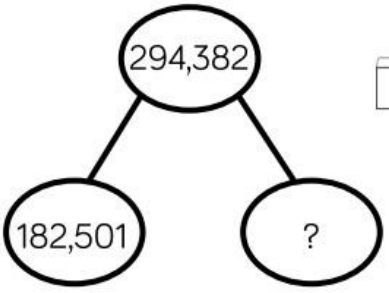
Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits.

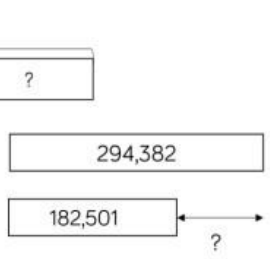
Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

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

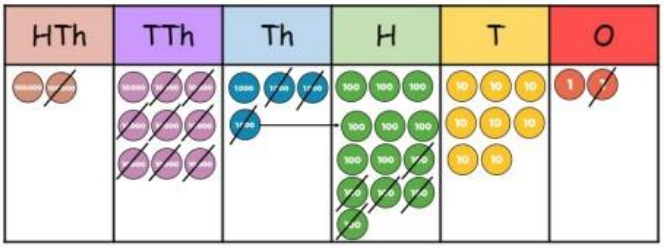
Skill: Subtract numbers with more than 4 digits

Year: 5/6





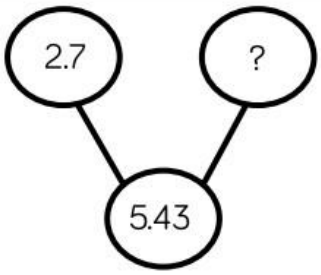
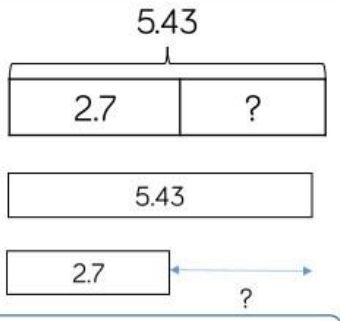
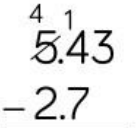
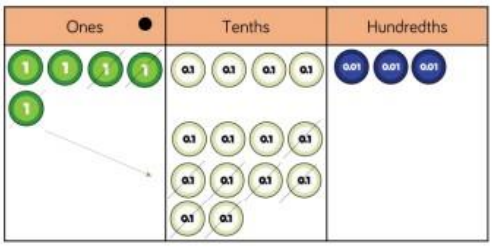
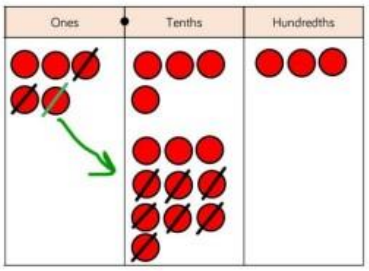
$$294{,}382 - 182{,}501 = 111{,}881$$



	2	9	$^{3}\cancel{4}$	$^{1}3$	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
  $5.43 - 2.7 = 2.73$   	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

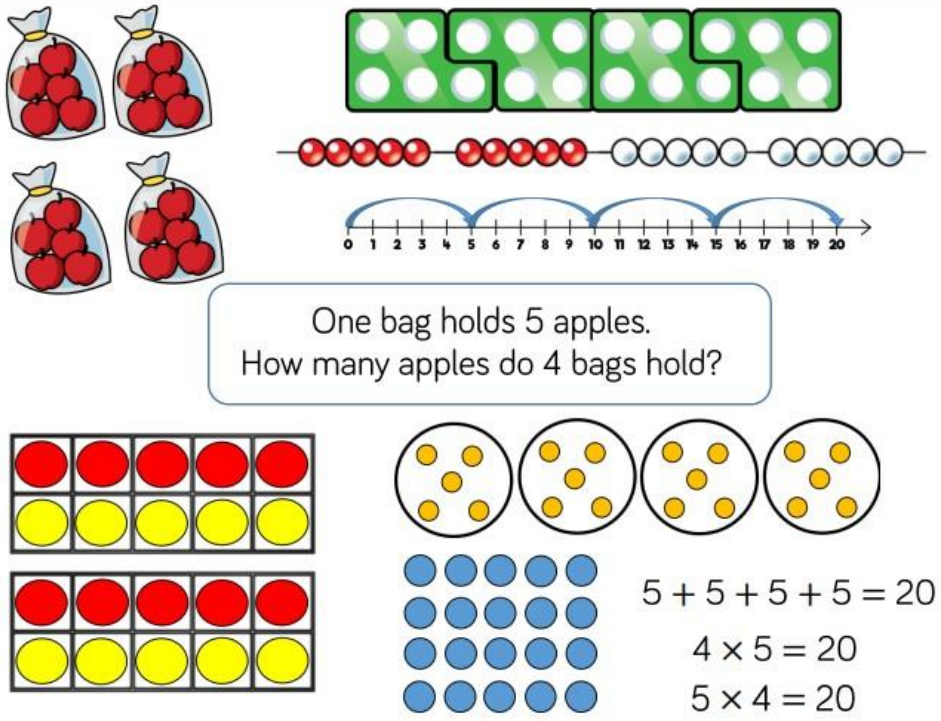
During the Summer Term, the children in Year 4 sit the Multiplication Tables Check in line with the Government's assessment framework.

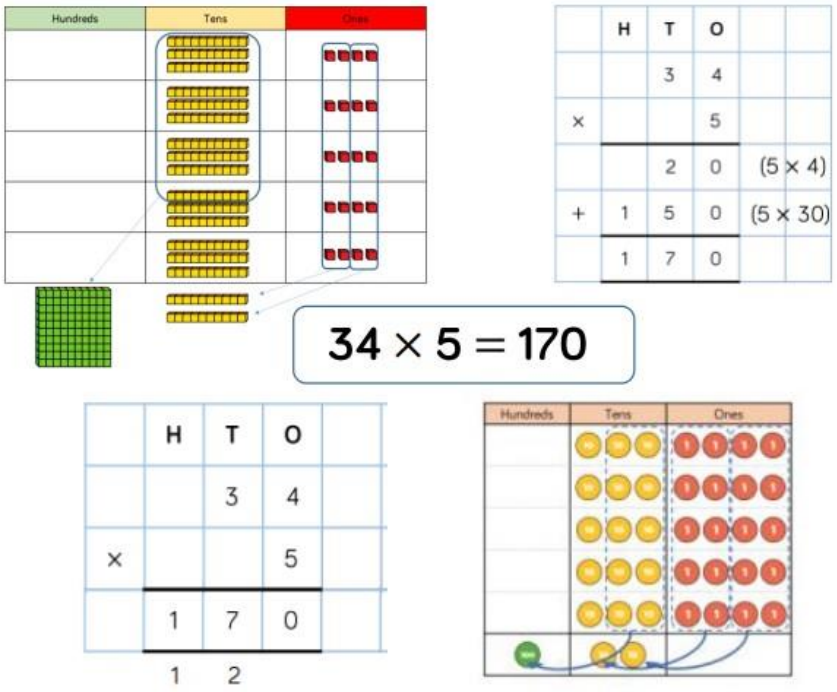
Times tables continue to be recalled and tested throughout Years 5 and 6.

Skill	Year	Representations 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

Skill	Year	Representations and models	
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

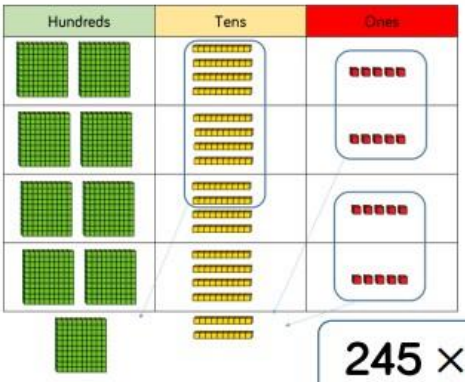
Skill	Year	Representations and models	
Recall and use multiplication and division facts for the 7-times table	4	Hundred square Number shapes	Bead strings Number lines
Recall and use multiplication and division facts for the 9-times table	4	Hundred square Number shapes	Bead strings Number lines
Recall 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
Recall and use multiplication and division facts for the 6-times table	4	Hundred square Number shapes	Bead strings Number tracks Everyday objects

Skill: Solve 1-step problems using multiplication	Year: 1/2
	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
	Teachers may decide to first look at the expanded column method before moving on to the short multiplication method. The 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.

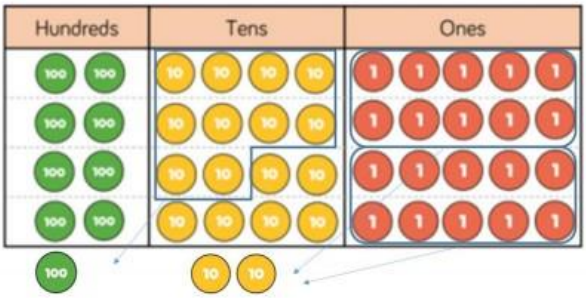
Skill: Multiply 3-digit numbers by 1-digit numbers

Year: 3/4



	H	T	O
	2	4	5
×			4
	9	8	0
	1	2	

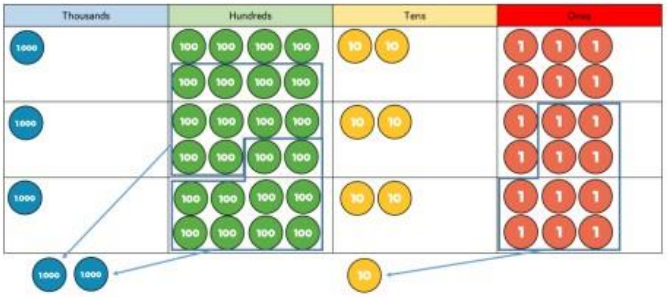
$245 \times 4 = 980$



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.

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

Year: 5



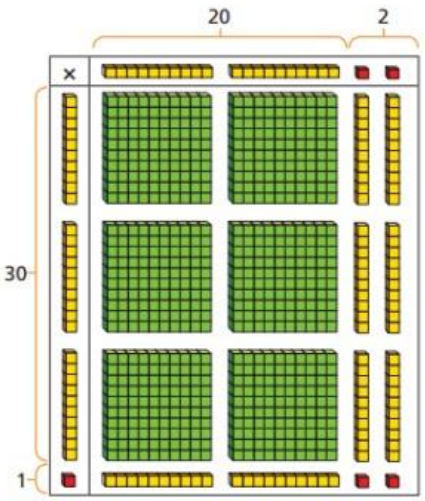
$1{,}826 \times 3 = 5{,}478$

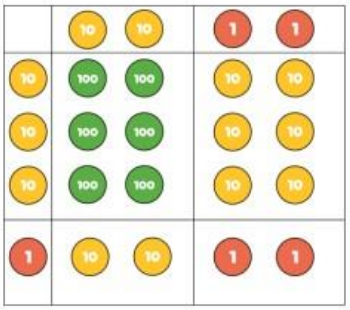
	Th	H	T	O
	1	8	2	6
×				3
	5	4	7	8
	2		1	

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

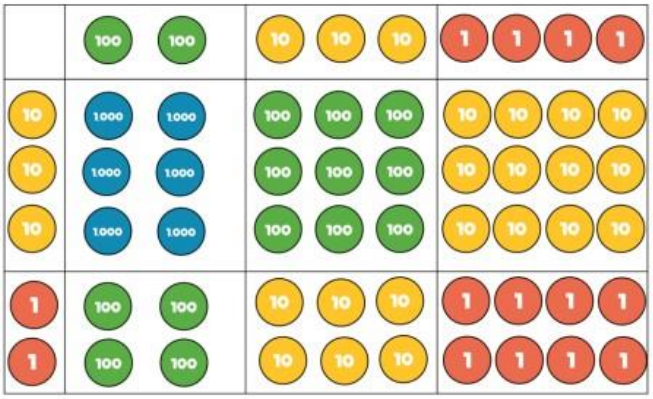
	H	T	O
		2	2
×		3	1
		2	2
	6	6	0
	6	8	2

$22 \times 31 = 682$

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



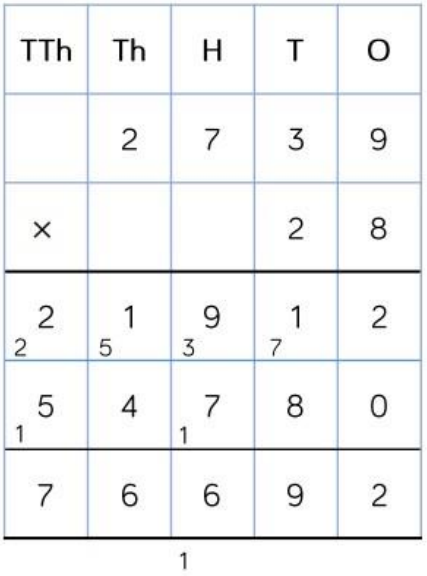
Th	H	T	O
	2	3	4
×		3	2
	4	6	8
$^{1}7$	$^{1}0$	2	0
7	4	8	8

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

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

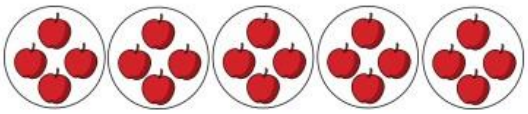
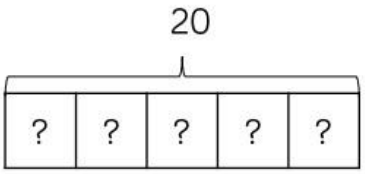
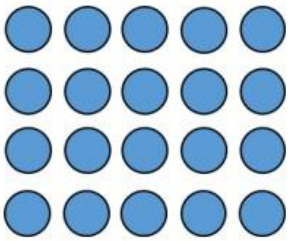
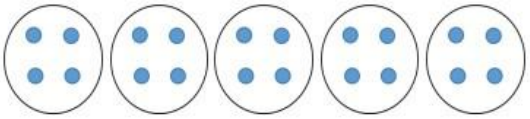
Children can continue to use the area model when multiplying 3-digits by 2-digits. Place value counters become more efficient to use but Base 10 can be used to highlight the size of numbers.

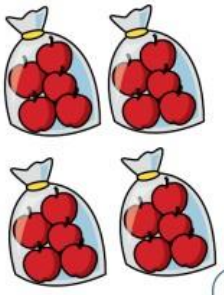
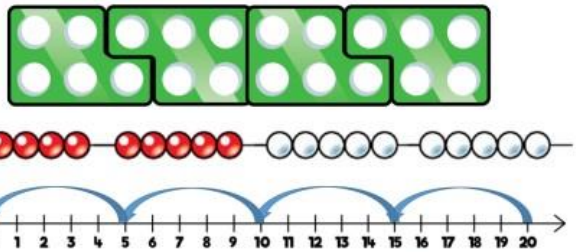
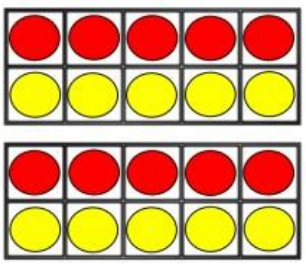
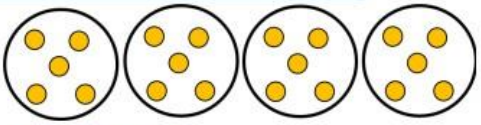
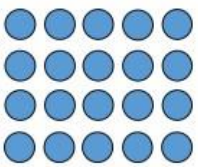
Encourage children to move towards the formal written method, seeing the links with the grid method.

Skill: Multiply 4-digit numbers by 2-digit numbers	Year: 5/6
	When multiplying 4-digits by 2-digits, children should be confident in the written method. If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method. Consider where exchanged digits are placed and make sure this is consistent.

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

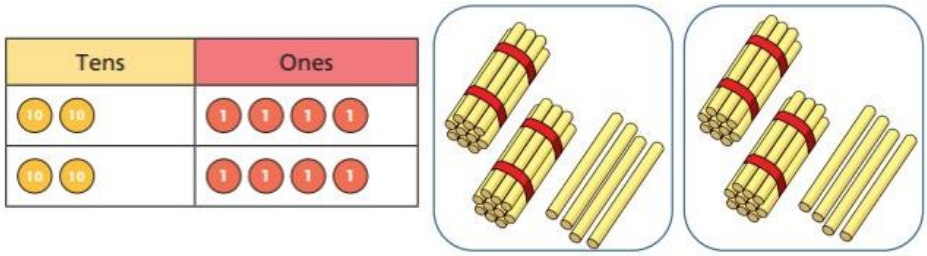
Division

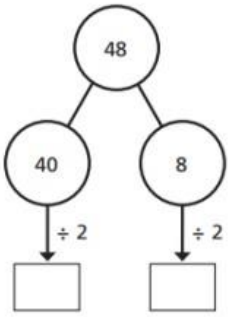
Skill: Solve 1-step problems using multiplication (sharing)	Year: 1/2
  There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag?   $20 \div 5 = 4$	Children solve problems by sharing amounts into equal groups. In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally. In Year 2, children are introduced to the division symbol.

Skill: Solve 1-step problems using division (grouping)	Year: 1/2
  There are 20 apples altogether. They are put in bags of 5. How many bags are there?    $20 \div 5 = 4$	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.

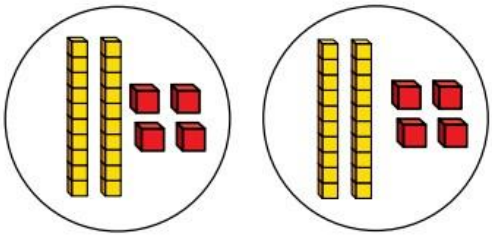
Skill: Divide 2-digits by 1-digit (sharing with no exchange)

Year: 1/2





$48 \div 2 = 24$



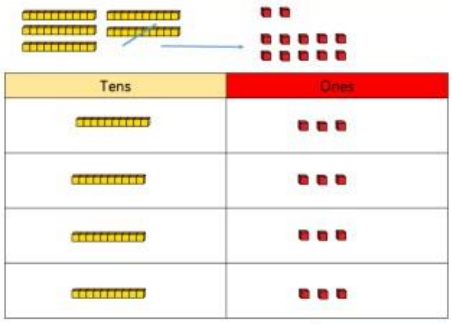
When dividing larger numbers, children can use manipulatives that allow them to partition into tens and ones.

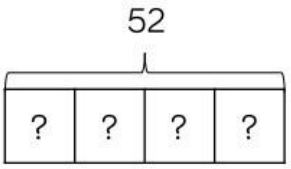
Straws, Base 10 and place value counters can all be used to share numbers into equal groups.

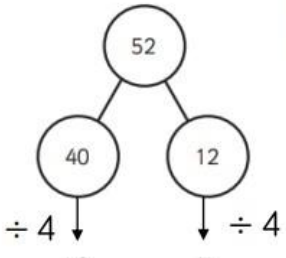
Part-whole models can provide children with a clear written method that matches the concrete representation.

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

Year: 3/4







$10 + 3 = 13$

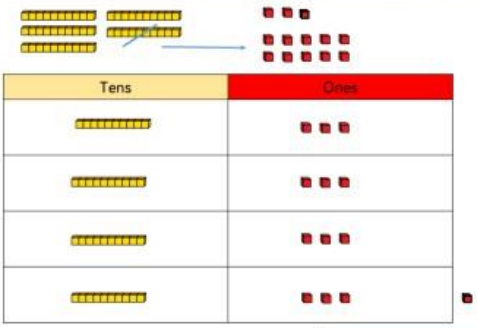
$52 \div 4 = 13$

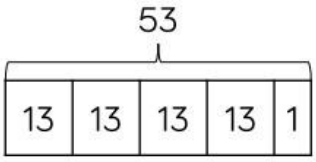
When dividing numbers involving an exchange, children can use Base 10 and place value counters to exchange one ten for ten ones.
Children should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows.

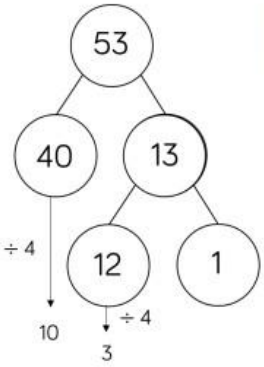
Flexible partitioning in a part-whole model supports this method.

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

Year: 3/4





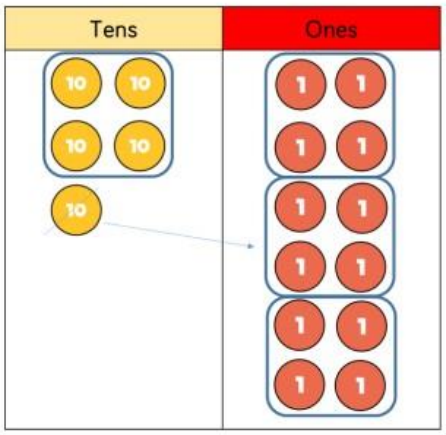


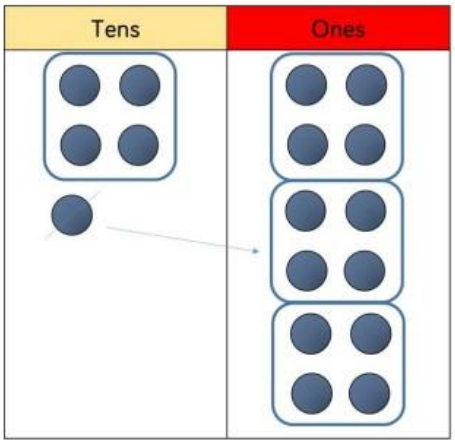
53 ÷ 4 = 13 r1

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: 4/5





52 ÷ 4 = 13

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

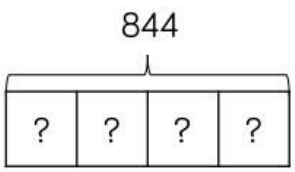
Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?'

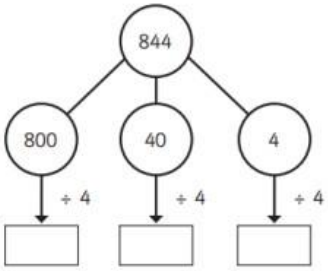
Remainders can also be seen as they are left ungrouped.

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

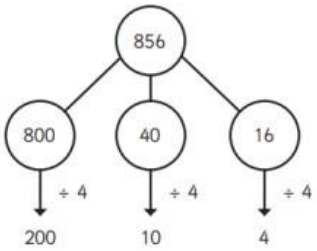
Year: 4

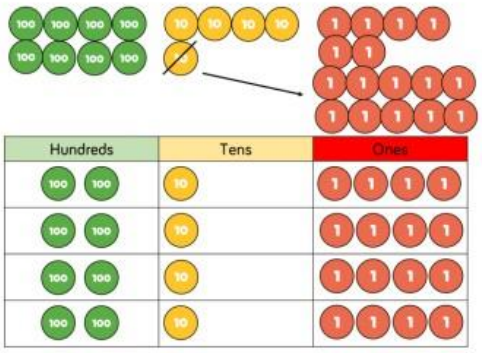
844 ÷ 4 = 211





844 ÷ 4 = 211

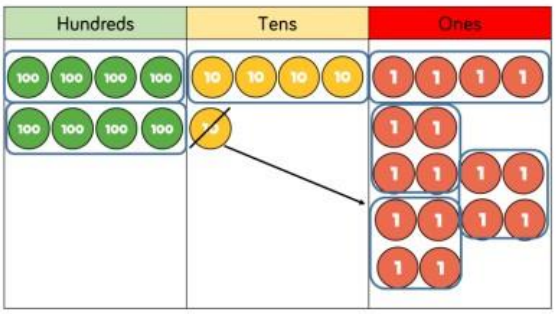




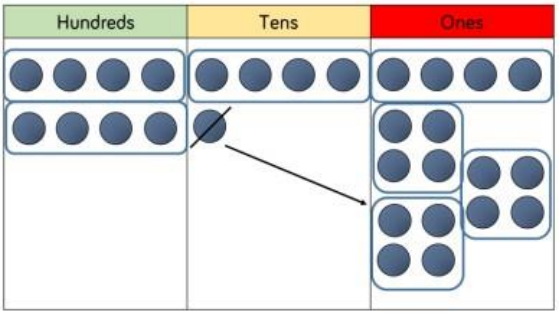
Children can continue to use place value counters to share 3-digit numbers into equal groups. Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows. This method can also help to highlight remainders. Flexible partitioning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

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

Year: 5



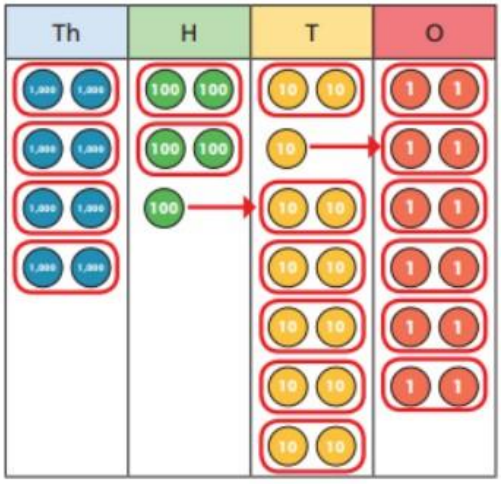
		2	1	4
	4	8	5	$^{1}6$



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
 8,532 ÷ 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.

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

Skill: Divide multi digits by 2-digits (short division)	Year: 6
432 ÷ 12 = 36 7,335 ÷ 15 = 489	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.

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

		0	4	8	9
15	7	$^{7}3$	$^{13}3$	$^{13}5$	

15	30	45	60	75	90	105	120	135	150

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

(×30)

(×6)

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

$432 \div 12 = 36$

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

	0	4	8	9	
15	7	3	3	5	
–	6	0	0	0	(×400
	1	3	3	5	
–	1	2	0	0	(×80)
		1	3	5	
–		1	3	5	(×9)
				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)	Year: 6

$372 \div 15 = 24$ r12

			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.