MATHEMATICS & CALCULATION POLICY

July 2022

REVIEW DATE:	July 2023	
SIGNED OFF BY:	C Elliott	D Johnson
ROLE:	Headteacher	Chair of Governor
LEAD PROFESSIONAL:	T Bell	
STATUS:		

Sandal Magna Mathematics Policy

The Importance of Mathematics

"Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject."

(The National Curriculum for Mathematics 2014)

At SMCA we believe Mathematics is a proficiency which involves confidence and competence with numbers and measures. Our intent is to develop children to be confident, resilient and determined mathematicians, who enjoy maths and appreciate its importance as a valuable skill for life. A solid and rigorous approach to arithmetic skills progression ensures our children are well equipped to recall knowledge, tackle year group specific content and to be fluent and confident when reasoning and solving a wider range of mathematical problems. With reasoning skills and vocabulary at the very heart of our mathematics lessons, we encourage all children to think both independently and in collaboration with others. We celebrate learning from our mistakes and opportunities to unpick, share and prove our mathematical reasoning in varied contexts. Resilience is fostered and developed, to encourage children to relish every opportunity and rise to the challenges which life offers them. We are committed to ensuring that children are able to recognise the importance of maths in the wider world and are able to use their mathematical skills and knowledge confidently in their lives.

Aims:

The National Curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply theirknowledge rapidly and accurately to problems.
- can **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.

In addition, we aim to develop:

- An enjoyment and curiosity of mathematics and for children to feel confident to become successful;
- Children's abilities to use and apply mathematics to solve problems in both the classroom and in 'real life' contexts;
- A confidence to communicate ideas in written form and orally;
- Independent and collaborative ways of working, encouraging children to share ideas and solve problems together;
- A wide range of mathematical vocabulary to be modelled and used in the classroom environment;
- The children's ability to recall mental facts accurately and quickly and using effective written calculation methods;
- Children's logical thinking, reasoning and ability to problem solve as transferable life skills.

Breadth of study

Careful planning and preparation ensure that children throughout the school engage in:

- Practical activities and games that using a variety of resources
- Problem solving to challenge thinking
- Individual, paired, group and whole class learning and discussions
- Purposeful practise where time is given for them to apply their learning
- Open and closed tasks
- A range of problem-solving methods

Planning

Mathematics planning follow the White Rose Scheme of work with additional support from the NCETM spines if needed. Assessment for learning, fluency, reasoning and problem solving are at the heart of planning mathematics following a format of 'Try it! Apply it! Prove it!

Each lesson provides an opportunity for children to deepen their mathematical understanding. Our approach to planning is based on a thorough understanding of children's needs that is collected through formative and summative assessment. Moving on from the pandemic gives SMCA an opportunity to recalibrate and prioritise our mathematics

curriculum ensuring the needs of all pupils are clearly met. Current mathematics long and medium-term plans consider the disruption to teaching and learning and aim to secure firm foundations before moving on to new learning.

The use of White Rose end of unit assessments from the previous years' learning block equips teachers with where to start teaching and learning. In addition, daily Flashback 4 grid allows children to revisit previously learned skills to ensure they are embedded.

Each class teacher is responsible for the mathematics in their class in consultation with and with guidance from the mathematics subject leader. There is a daily mathematics lesson of between 50 and 60 minutes. During these lessons' children engage in activities such as:

- The development of mental strategies and arithmetic skills
- Flashback 4 grids (Flashback 6 for UPKS2)
- Mathematical discussions and reasoning tasks using precise mathematical language.
- Written methods
- Practical work
- Investigational work
- Problem-solving
- Consolidation of basic skills and routines
- CPA approach to developing understanding

In addition to the daily maths lessons, teachers provide opportunities to practice rapid recall facts to develop fluency. Rapid recall facts are shared each half term and children and parents via purple mash so they can practise these at home.

Teachers in EYFS ensure the children learn through a mixture of adult led and child-led activities both inside and outside the classroom. The majority of provision areas within the unit support early mathematics ensuring children can access maths opportunities throughout the day. In addition, there are daily maths lessons with an additional follow up focused activity for all reception children.

From September 2022 we are also providing our youngest children with the opportunity to develop 'Mastery Number', with the aim to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The intention over time is that children will leave KS1 with fluency in calculation and a confidence and flexibility with number. Attention will be given to key knowledge and understanding needed in Reception classes, and progression through KS1 to support success in the future.

Target Time

To ensure gaps in children's mathematics knowledge are closed quickly, pupils in KS2 have a daily mathematics target time session. Sessions are aimed at the four key mathematics operations; addition, subtraction, multiplication, division, and in addition fractions. These ensure children have clear understanding and strategies for calculation.
From September 2022, EYFS and KS1 pupils will be taking part in their daily 10-15 minutes Mastering Number sesssion developed by NCETM to secure foundations for strong mathematics in KS2.

Times Tables

In year 3 and Year 4, children are expected to learn times tables by heart, in order to prepare the Year 4 children for the statutory times tables test. Each week children complete TTRS activities and quizzes that develop rapid recall and fluency.

Children's Records of Work

Children are taught a variety of methods for recording their work and they are encouraged and helped to use the most appropriate and convenient method of recording. Children are encouraged to use mental strategies when appropriate, before choosing a written method. All children are encouraged to think about presentation ensuring work is presented neatly when recording their work. When using squares, one square is used for each digit.

In Y2 and Y3, 1cm square exercise books are to be used. This changes to 7mm square exercise books in Year 4 through to Year 6 for the majority of children, unless it is unsuitable.

EYFS record informally for the majority of the week, with some mathematics activity formally recorded in the children's maths books. This follows the schools WALT format.

Resources -Concrete, Pictorial, Abstract (CPA)

In order to support the delivery of maths lessons to all children, the school has a large range of resources available. Within the classroom, maths resources are available to children at all times, these include basic resources such as number lines, 100 squares, rulers, counters, numicon etc. Other specific resources are made available as required. We also recognise the importance of a stimulating learning environment. The school provides an environment, which is rich in a wide variety of print, pictures, diagrams, charts, tables, models and images. Each classroom has a mathematical display area, which includes a working wall with mathematical vocabulary, CPA representations, continuous maths provision and examples of the key calculation strategies taught to allow children to develop proficiency. This is updated regularly in accordance with the area of maths being taught at the time. Children are encouraged to use many representations to develop a deep conceptual understanding of mathematical ideas. Throughout the entire school, concrete, pictorial and abstract resources are used to provide a route to understanding. This follows the White Rose calculation policy which provides more information about the resources that are used for each area of maths.

EYFS teaching and learning promotes social skills and develops the mathematical understanding of young children through stories, songs, rhymes and games. Both imaginative play and outdoor play allow opportunities to develop many skills by using a range of resources, which enable children to learn the six key areas of early mathematics.

- Cardinality and Counting - Understanding that the cardinal value of a number refers to the quantity, or 'howmanyness' of things it represents

- Comparison- Understanding that comparing numbers involves knowing which numbers are worth more or less than each other.

- Composition-Understanding that one number can be made up from (composed from) two or more smaller numbers

- Pattern-Looking for and finding patterns helps children notice and understand mathematical relationships

- Shape and Space- Understanding what happens when shapes move, or combine with other shapes, helps develop wider mathematical thinking.

- Measures- Comparing different aspects such as length, weight and volume, as a preliminary to using units to compare later.

Continuous provision within the EYFS unit has maths incorporated into all areas of learning. In addition, there are specific maths areas both indoors and outdoors for children to investigate and apply their maths skills on a daily basis. Resources used in EYFS mirror resources used throughout school, this ensures children's familiarity in preparation for KS1.

Assessment, Feedback and Record Keeping

Assessment for learning occurs throughout the maths lesson, though all lessons involve a formal 'Try it' AFL question/s that enables teachers to adapt their teaching and/or provide a scaffolding task to ensure pupils meet the core objective. Verbal feedback is incisive and regular. On a daily basis, children self-assess against learning objective and WISH, giving them a sense of success. Pupil's work is marked in line with the marking policy and teachers model how corrections are made, giving children a chance to learn from their misconceptions or incorrect methods, editing their corrections in purple pen. White Rose end of unit assessments from the previous year, gives teachers an accurate view of gaps in learning and what new learning needs to take pace. Likewise, end of unit assessments and termly assessments are completed for each year group to assess what learning has been embedded. Assessments are taken from NFER, White Rose and past SATs papers. From these assessments, teachers complete a question analysis, which then identifies the children who need support. Termly pupil progress meetings ensure that pupils can be targeted for support via target time, pre-teaching or daily interventions. Insight is used to track pupil progress and termly school/trust moderation meetings are used to review the accuracy of judgements.

Contribution of Maths to teaching in other curriculum areas

Mathematics is a tool for everyday life. It is a network of concepts and relationships and is used to analyse and communicate information and ideas in practical tasks and problems. By making links to other subjects at the initial planning stage we aim to provide real context in which to apply skills taught during the maths lessons. From September 2022, our aim is to provide pupils with a termly 'Maths in real life Context' day every term where they can see first-hand how maths impacts everyday life.

Inclusion

Children with special educational needs:

- Within the daily mathematics lesson teachers provide scaffolding activities to support children. Children with SEND are taught within the daily mathematics lesson and are able to take part at their level, sometimes with the support of a teacher or teaching assistant and always with appropriately differentiated activities and resources. WPS are used to plan small steps for pupils where necessary.
- Where applicable, children will do different rapid recall work or arithmetic to ensure they can access work. However, they will often be encouraged to take part in whole class inputs using additional resources such as numicon, base ten or practical manipulatives.
- Intervention groups, target time and pre-teaching will take place at times throughout the year, in order to give further support to vulnerable groups.

All children at SMCA have an equal entitlement to access the maths curriculum and make progress in order to attain the best they can in the subject.

Monitoring Teaching and Learning

This will be undertaken by the subject leader and other members of SLT.
Areas to be monitored will be decided at the beginning of each term and will be recorded on the monitoring calendar. Results of any monitoring will be fed back to staff quickly and to SLT at their meetings so that any action required can be carried out effectively. Half termly mathematics CPD is including in the school's staff meeting schedules and ensure consistency. Support from the trust is accessed and utilised on a half termly basis to ensure sharing of good practice, supportive criticism and moderation.

Roles and Responsibilities

1. **Subject Leader:**
   - Supports teachers in their planning and teaching;
   - Lead by example in the way they teach in their own classroom;
   - Prepare, organise and lead INSET/staff meetings, with the support of the Head teacher;
   - Work co-operatively with the SENCO;
   - Monitor different aspects of maths teaching and learning feeding back to SLT and staff on findings and future actions.
   - Attend INSET provided by the trust.
   - Be available to discuss the progress of maths in the school with the head teacher, class teachers, parents and governors.

2. **Class Teachers:**
   To deliver a daily maths lesson to all children which are engaging and motivating. That are line with school policy and procedures and are informed by the National Curriculum for Mathematics 2014.

3. **Children:**
   To develop their skills, understanding and attainment in maths through engagement with daily lessons and behaviour conducive to learning.

4. **Parents / Carers:**

To support their children's learning in maths by taking an interest in their child's progress, encouraging the children to complete maths homework and having a good relationship with the class teacher so that queries and problems regarding maths can be dealt with easily.

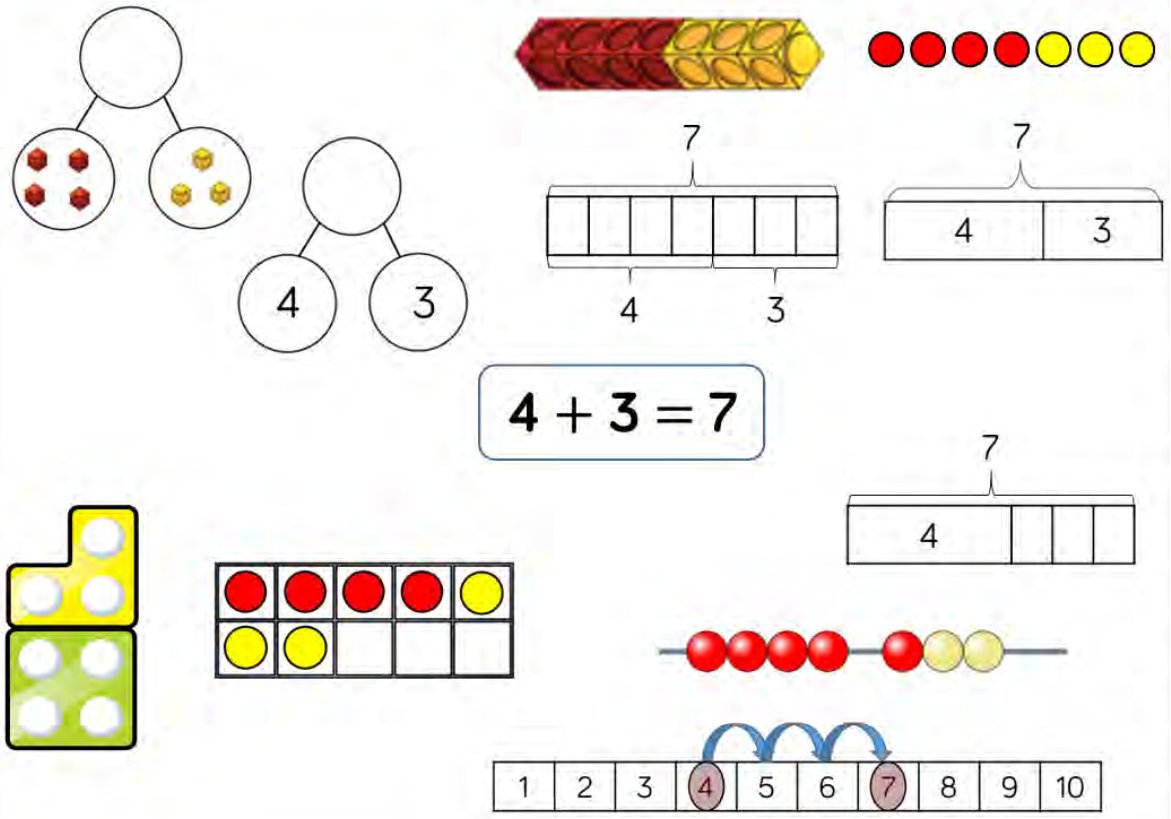
Calculation Policy Representations

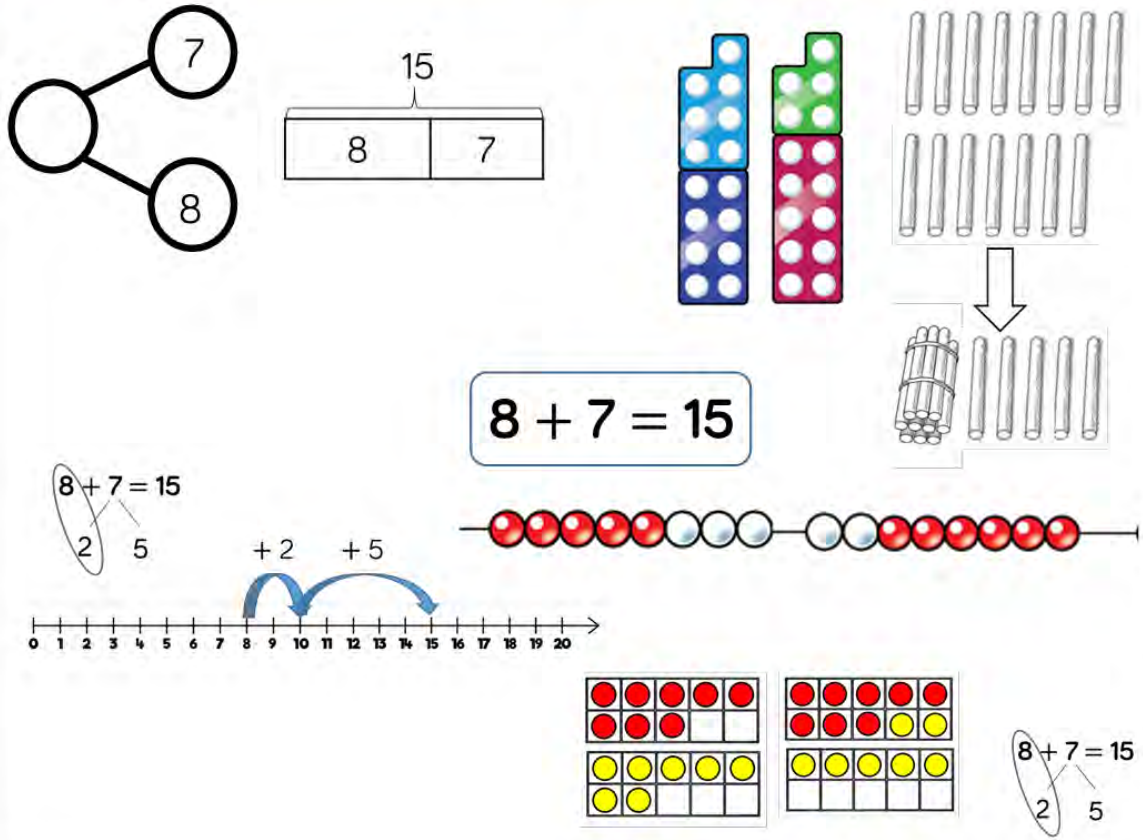
The Calculation Policy below is broken down into addition, subtraction, multiplication and division. Each operation is then broken down into skills and each skill has a dedicated page showing the different models and images that could be used to effectively teach that concept. There is an overview of skills linked to year groups to support consistency throughout school.

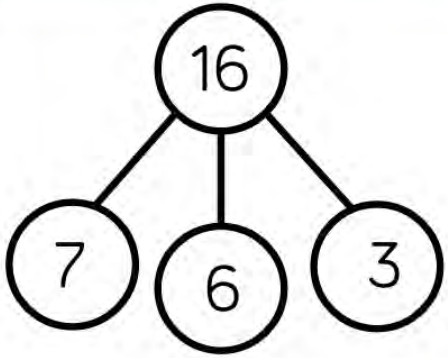
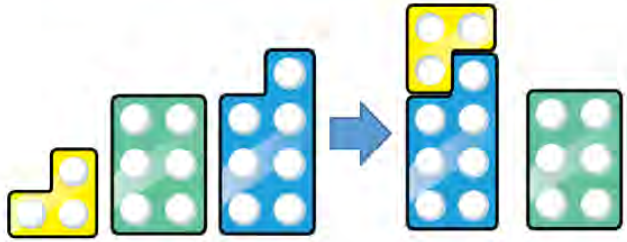
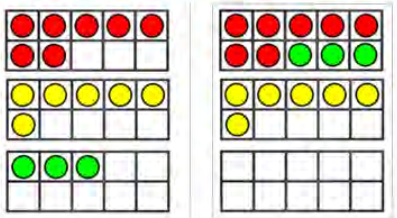
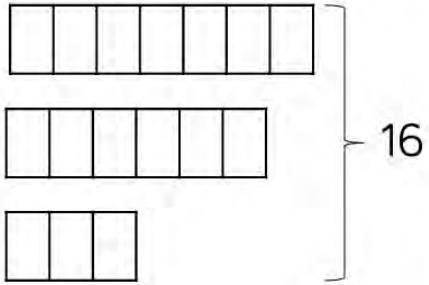
Please see each year groups representations below

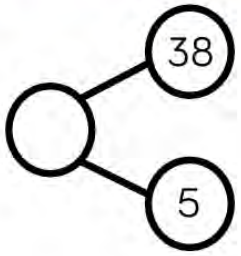
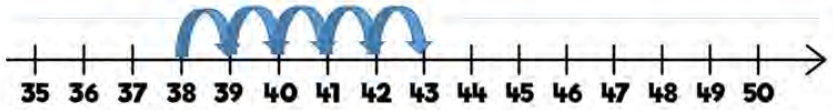
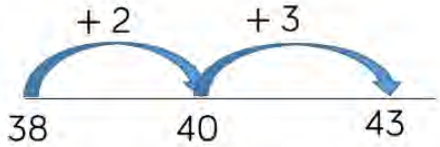
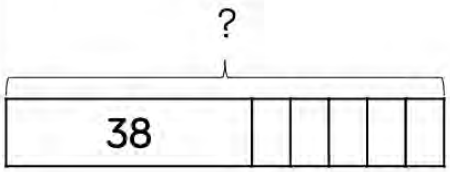
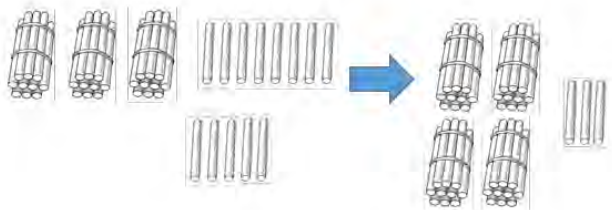
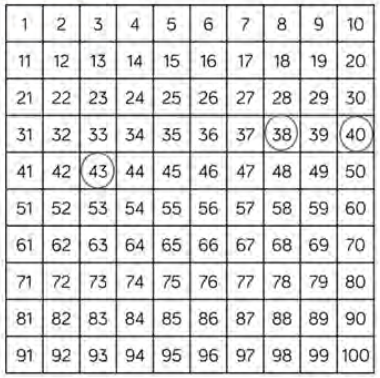
Skill	Year	Representations and models	
Add two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes	Ten frames (within 10) Bead strings (10) Number tracks
Add 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)	Bead strings (20) Number tracks Number lines (labelled) Straws
Add three 1-digit numbers	2	Part-whole model Bar model	Ten frames (within 20) Number shapes
Add 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled)	Number lines (blank) Straws Hundred square

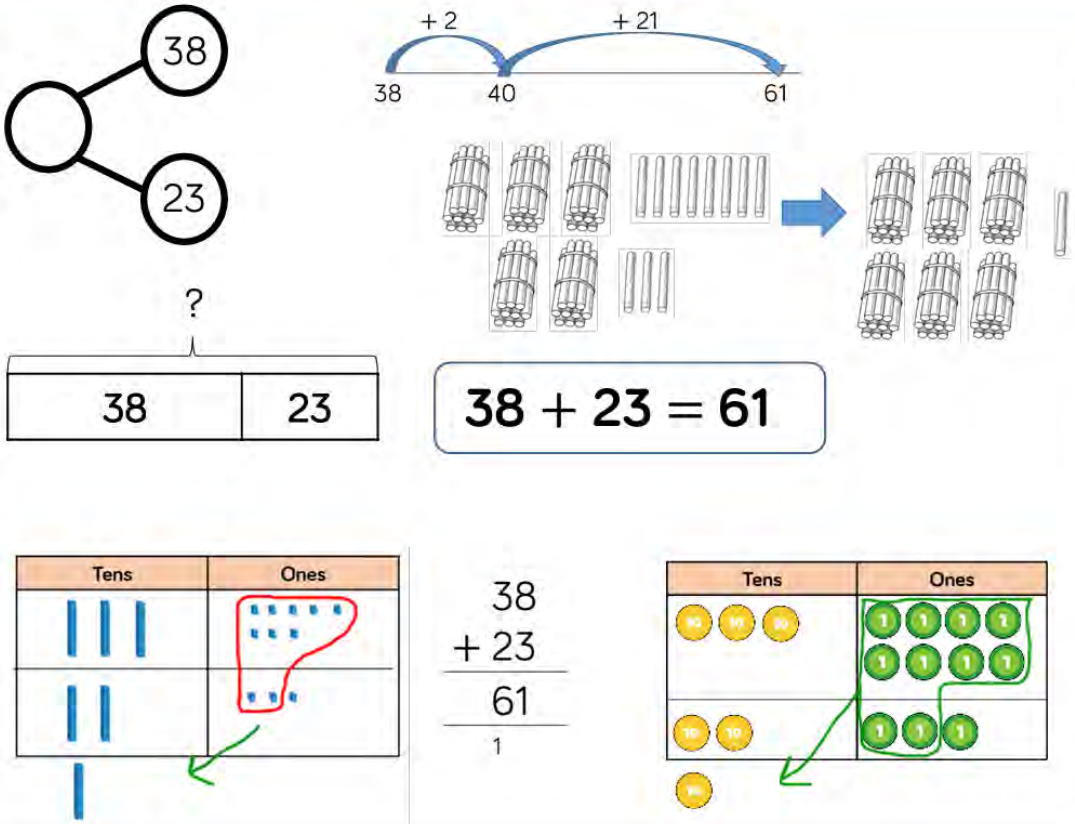
Skill	Year	Representations and models	
Add two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws	Base 10 Place value counters
Add with up to 3-digits	3	Part-whole model Bar model	Base 10 Place value counters Column addition
Add with up to 4-digits	4	Part-whole model Bar model	Base 10 Place value counters Column addition
Add with more than 4 digits	5	Part-whole model Bar model	Place value counters Column addition
Add with up to 3 decimal places	5	Part-whole model Bar model	Place value counters Column addition

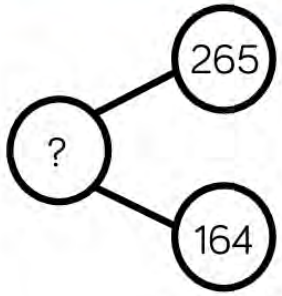
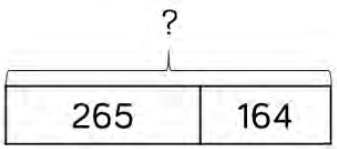
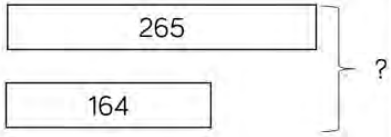
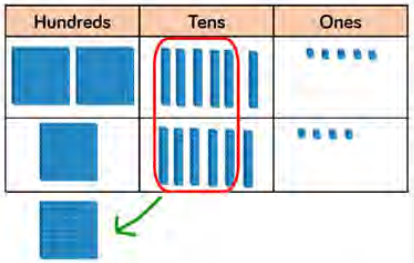
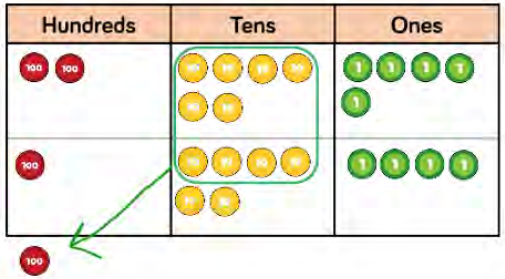
Skill: Add 1-digit numbers within 10	Year: 1
	When adding numbers to 10, children can explore both aggregation and augmentation. The part-whole model, discrete and continuous bar model, number shapes and ten frame support aggregation. The combination bar model, ten frame, bead string and number track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

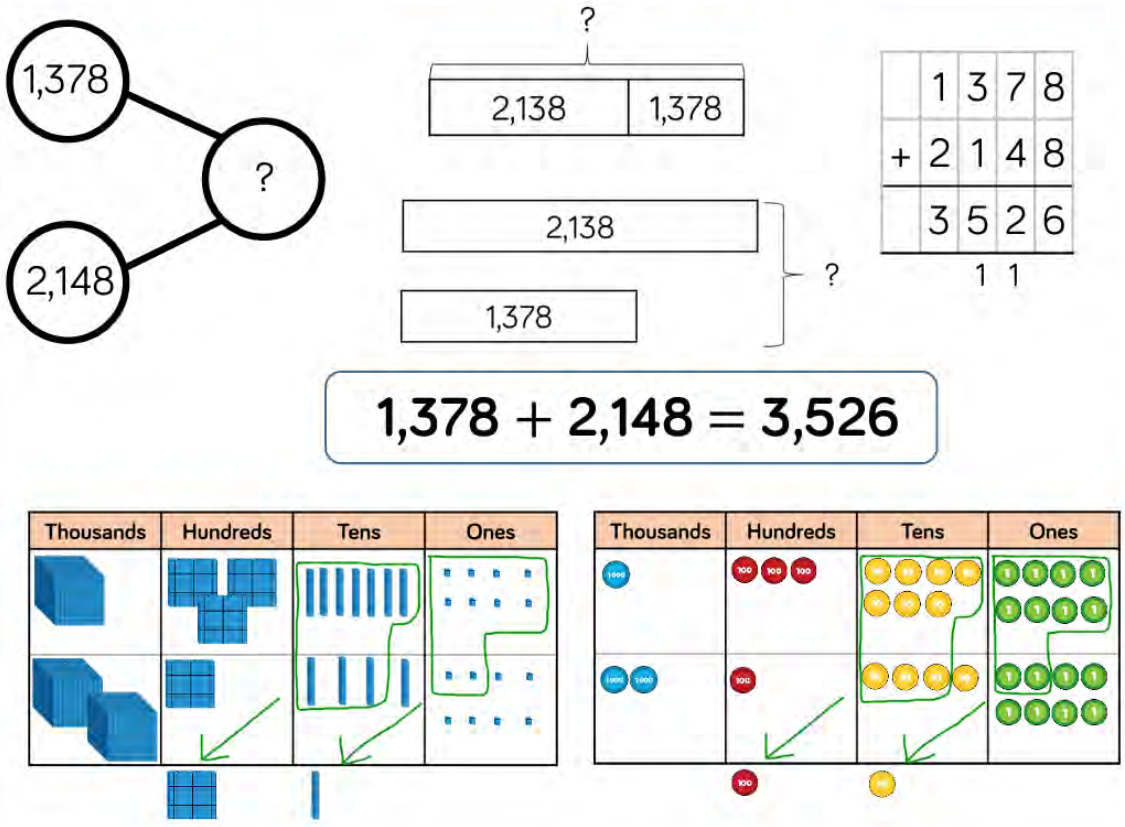
Skill: Add 1 and 2-digit numbers to 20	Year: 1/2
	When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten. In Year 1, this is only done just by counting on. From Year 2, use different manipulatives can be used to represent this exchange alongside number lines to support children in understanding how to partition their jumps.

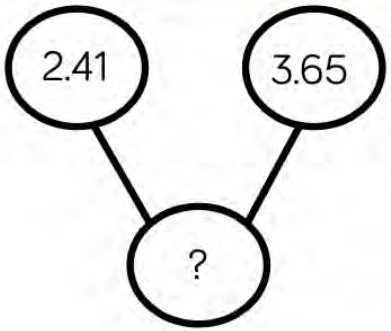
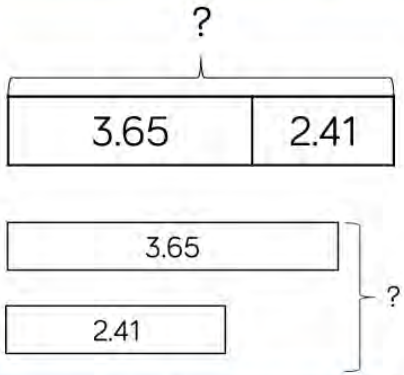
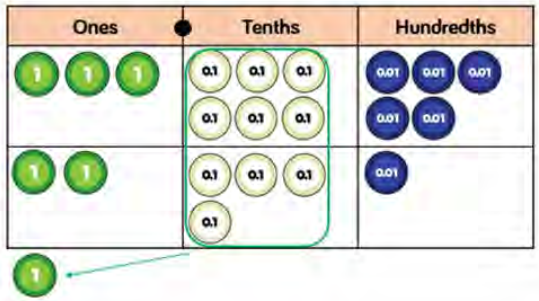
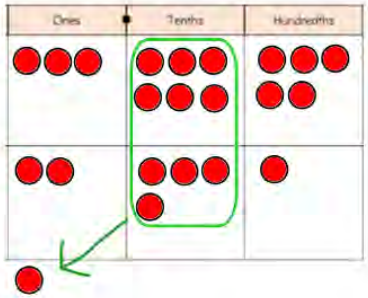
Skill: Add three 1-digit numbers	Year: 2
  $7 + 6 + 3 = 16$  $7 + 6 + 3 = 16$ 10 	When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently. This supports children in their understanding of commutativity. Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.

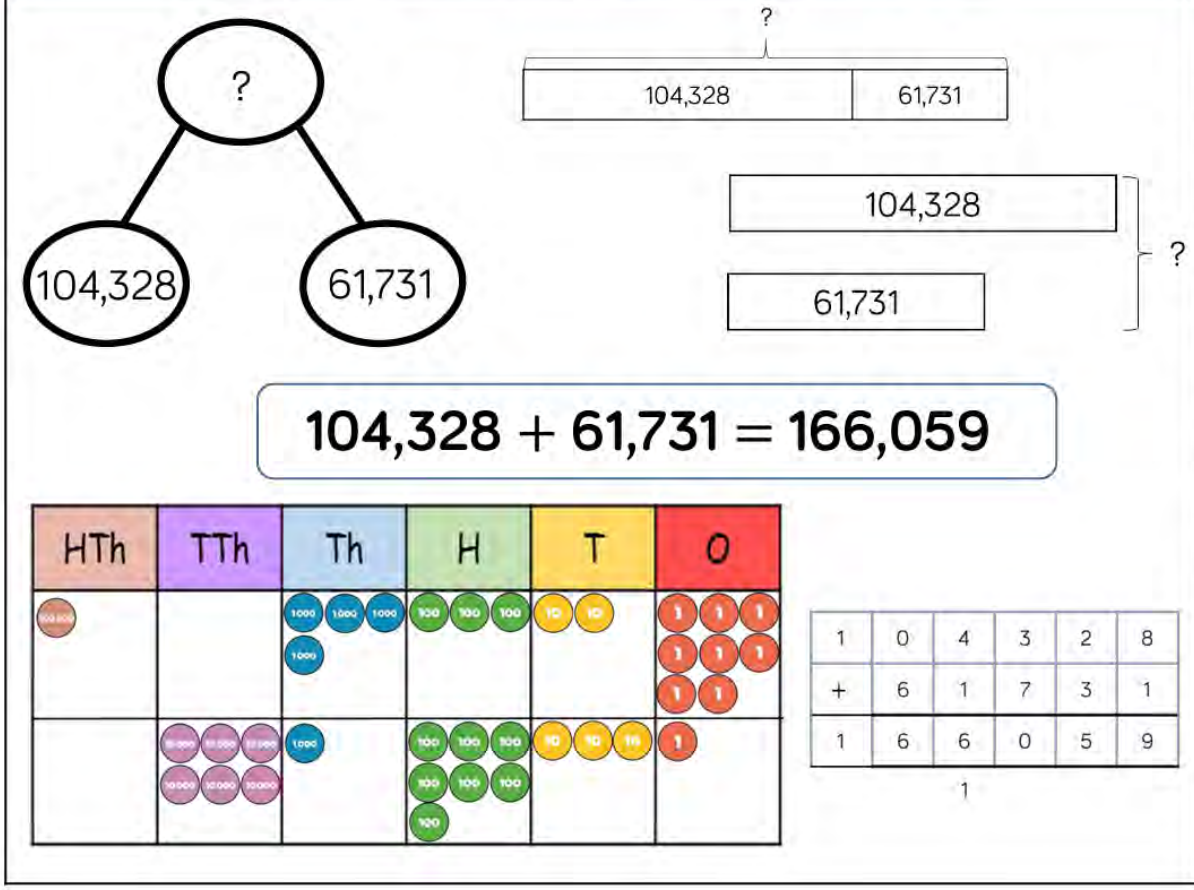
Skill: Add 1-digit and 2-digit numbers to 100	Year: 2/3
    **38 + 5 = 43**  	When adding single digits to a two-digit number, children should be encouraged to count on from the larger number. They should also apply their knowledge of number bonds to add more efficiently e.g. 8 + 5 = 13 so 38 + 5 = 43. 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
	Children can use a blank number line and other representations to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient. From Year 3, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.

Skill: Add numbers with up to 3 digits	Year: 3
   $265 + 164 = 429$  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
	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.

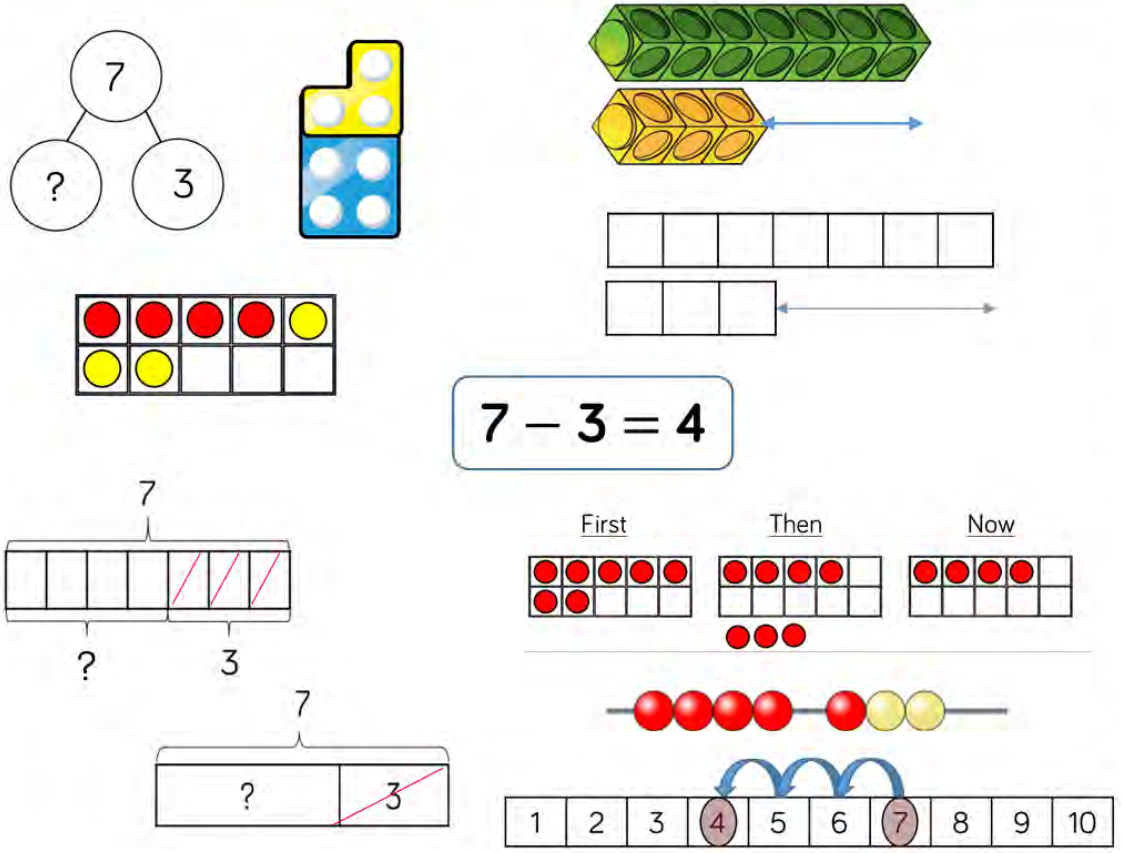
Skill: Add with up to 3 decimal places	Year: 5
  $3.65 + 2.41 = 6.06$  	$\begin{array}{r} 3.65 \\ +\ 2.41 \\ \hline 6.06 \\ \hline 1 \end{array}$ Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1, 2 and then 3 decimal places. 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.

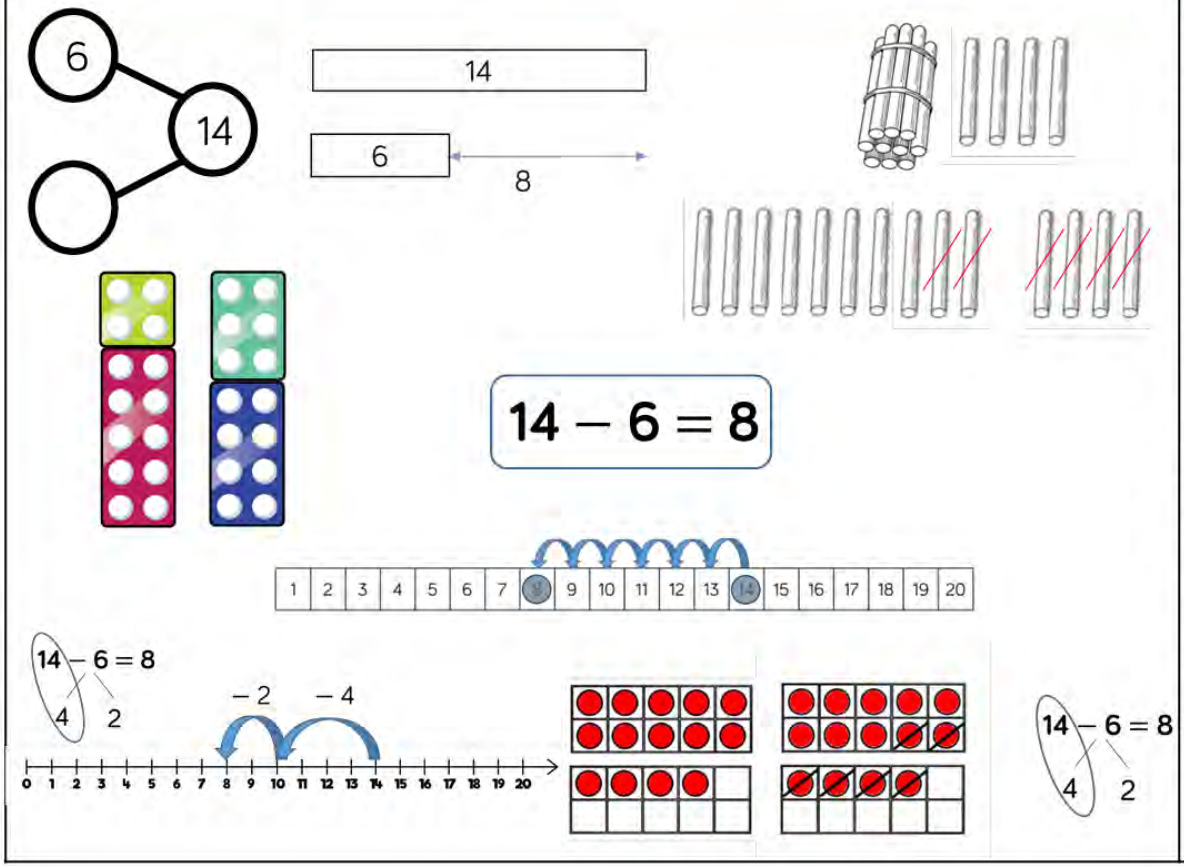
Skill: Add numbers with more than 4 digits	Year: 5/6
	Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits. At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.

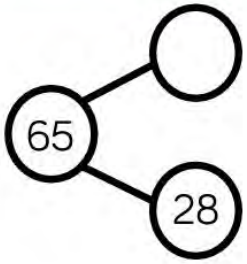
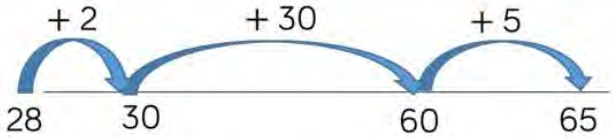
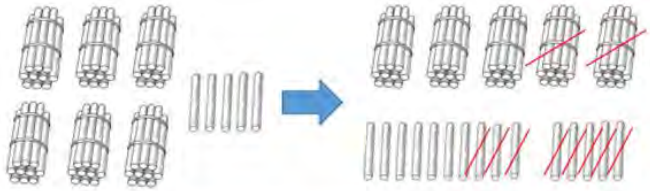
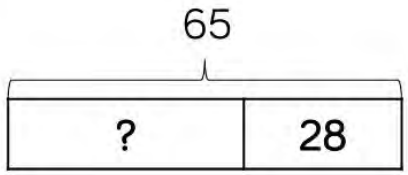
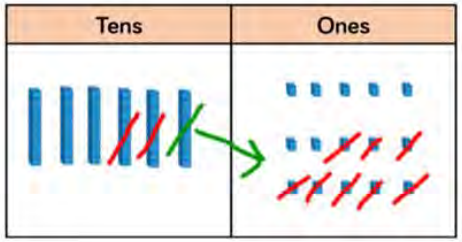
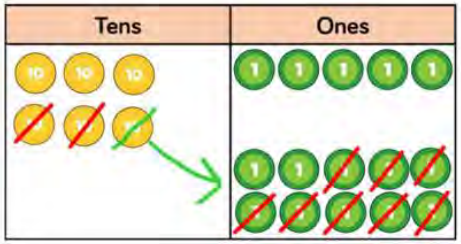
1	0	4	3	2	8
+	6	1	7	3	1
1	6	6	0	5	9
		1			

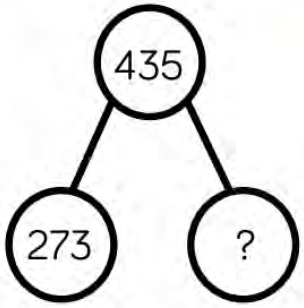
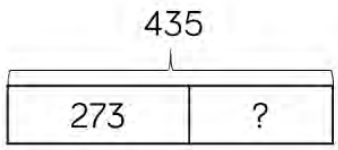
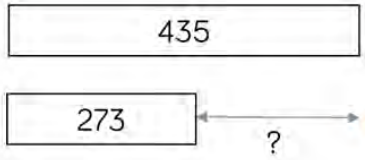
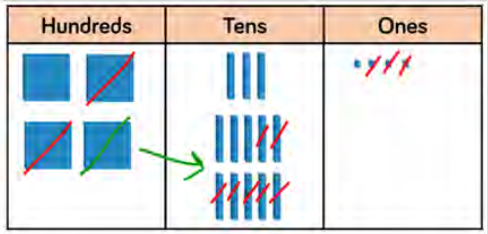
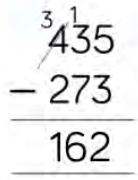
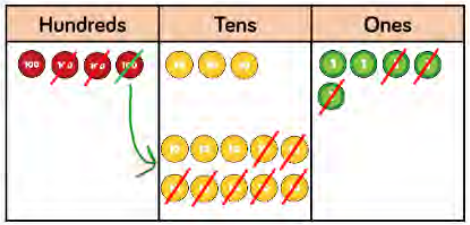
Skill	Year	Representations and models	
Subtract two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes	Ten frames (within 10) Bead strings (10) Number tracks
Subtract 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)	Bead string (20) Number tracks Number lines (labelled) Straws
Subtract 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled)	Number lines (blank) Straws Hundred square
Subtract two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws	Base 10 Place value counters

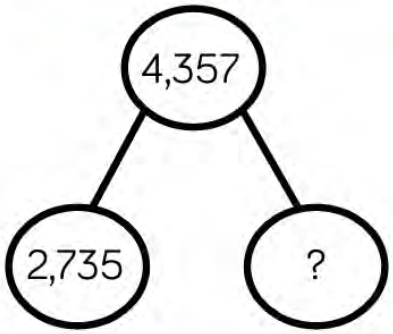
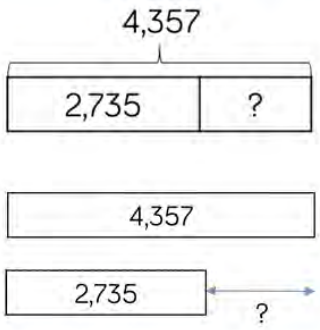
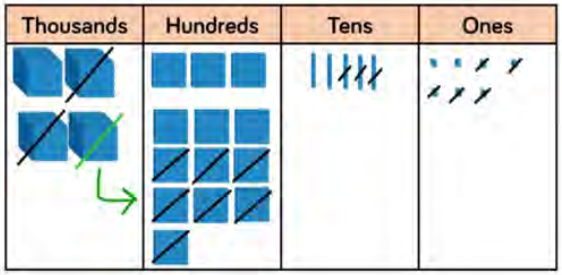
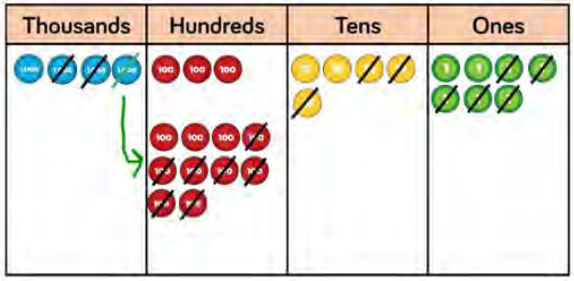
Skill	Year	Representations and models	
Subtract with up to 3-digits	3	Part-whole model Bar model	Base 10 Place value counters Column subtraction
Subtract with up to 4-digits	4	Part-whole model Bar model	Base 10 Place value counters Column subtraction
Subtract with more than 4 digits	5	Part-whole model Bar model	Place value counters Column subtraction
Subtract with up to 3 decimal places	5	Part-whole model Bar model	Place value counters Column subtraction

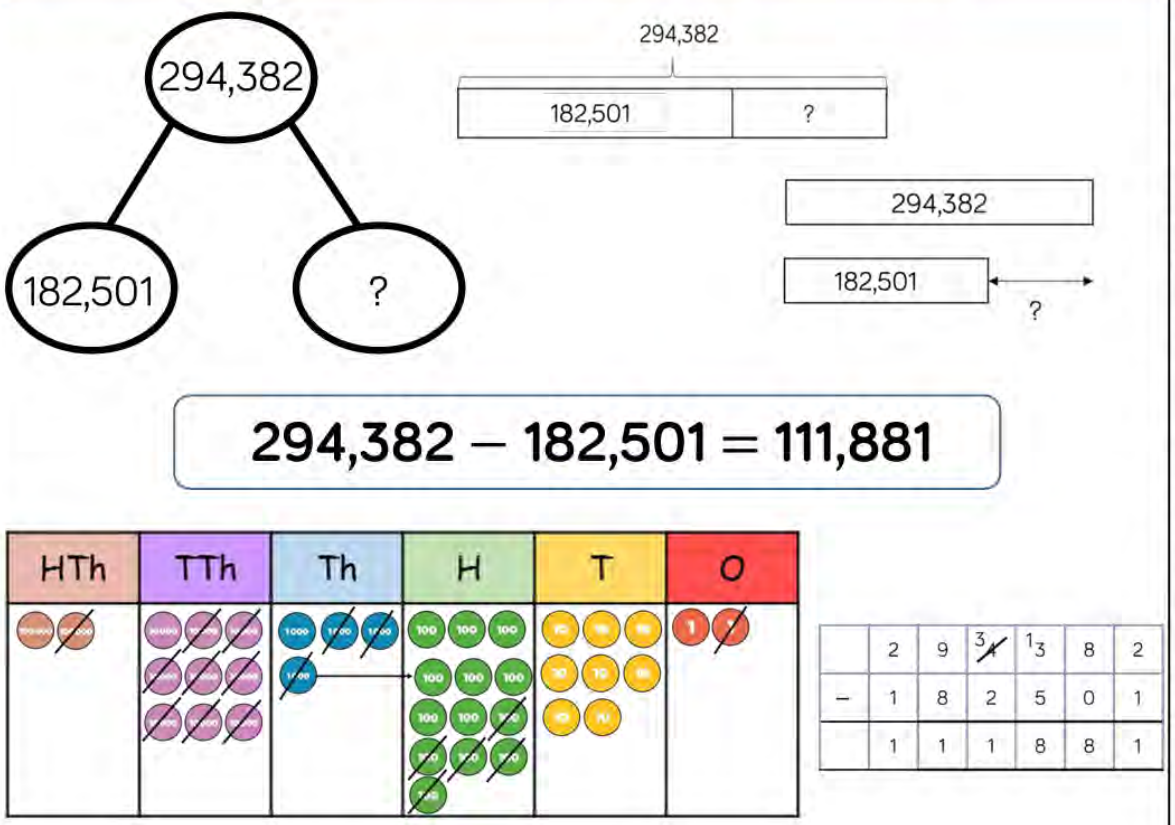
Skill: Subtract 1-digit numbers within 10	Year: 1
	Part-whole models, bar models, ten frames and number shapes support partitioning. Ten frames, number tracks, single bar models and bead strings support reduction. Cubes and bar models with two bars can support finding the difference.

Skill: Subtract 1 and 2-digit numbers to 20	Year: 1/2
	In Year 1, subtracting one-digit numbers that cross 10, is done by counting back, using objects, number tracks and number lines. From Year 2, children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this.

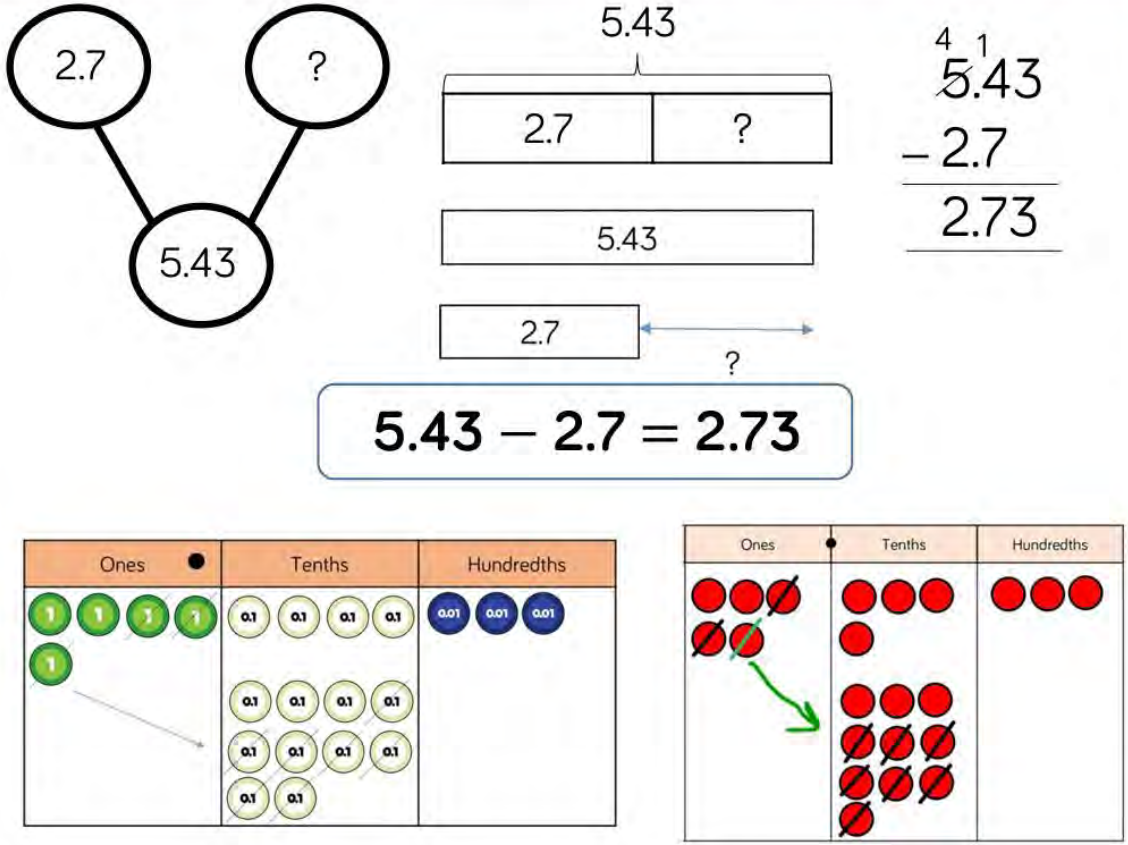
Skill: Subtract 1 and 2-digit numbers to 100	Year: 2/3
    $65 - 28 = 37$  $\begin{array}{r} {}^{5}\not{6}\,{}^{1}\not{5} \\ -\ 2\ 8 \\ \hline 3\ 7 \end{array}$ 	Children can also use a blank number line to count back to find the difference. Encourage them to jump to multiples of 10 to become more efficient.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

Skill: Subtract numbers with up to 3 digits	Year: 3
   **435 − 273 = 162**   	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
  3 1 ~~4~~357 − 2735 1622 **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.

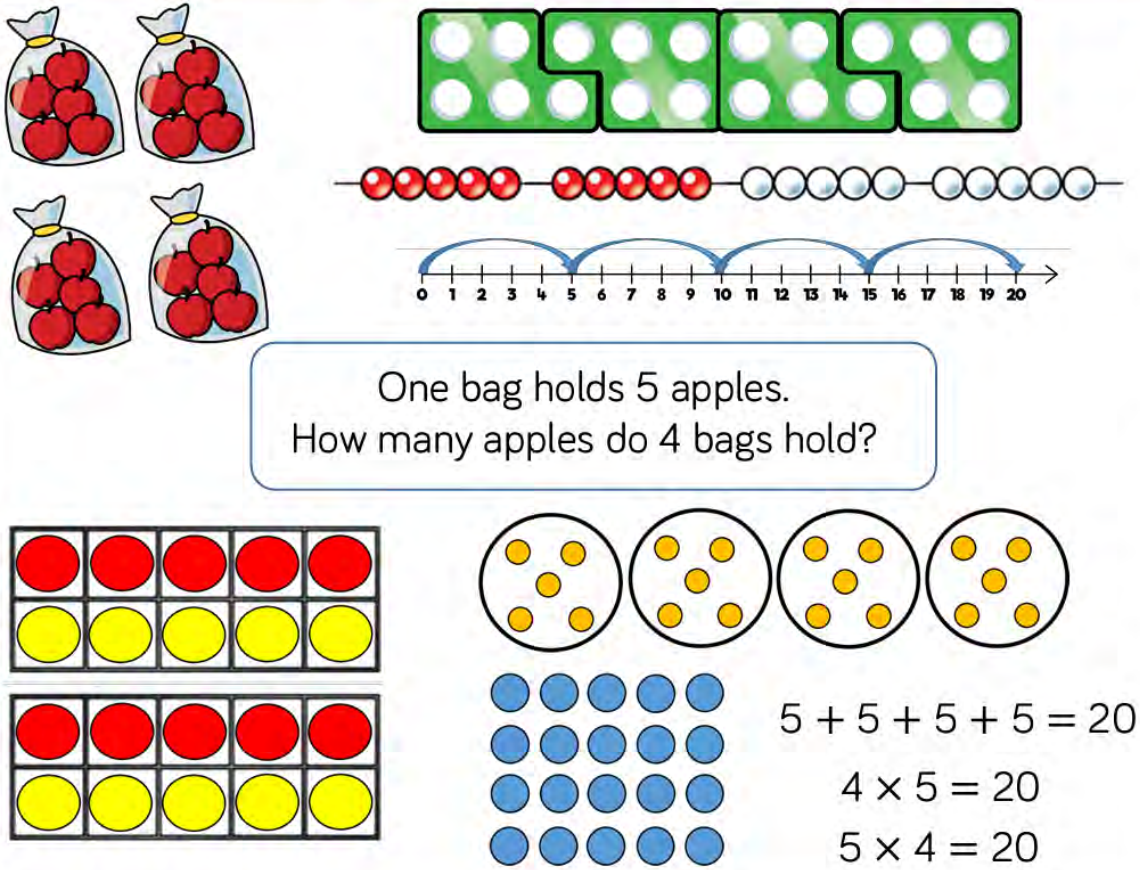
Skill: Subtract numbers with more than 4 digits	Year: 5/6
	Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits. At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.

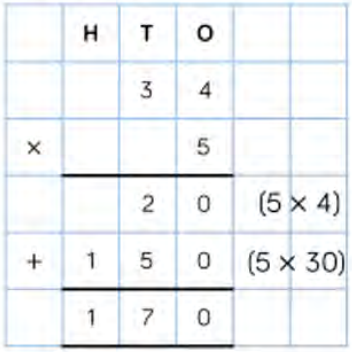
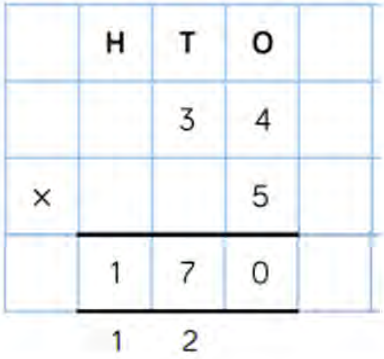
	2	9	$^{3}\not{4}$	$^{1}3$	8	2
−	1	8	2	5	0	1
	1	1	1	8	8	1

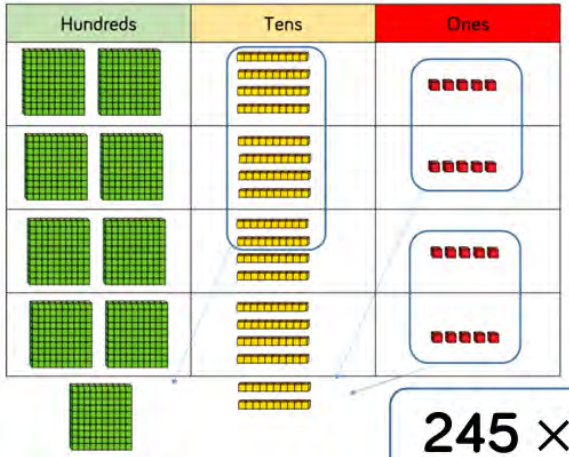
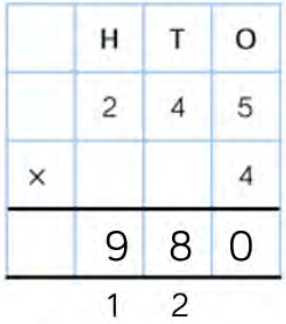
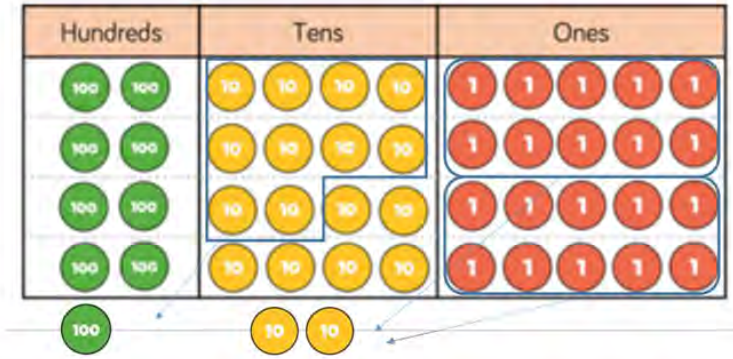
Skill: Subtract with up to 3 decimal places	Year: 5/6
	Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places. Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures.

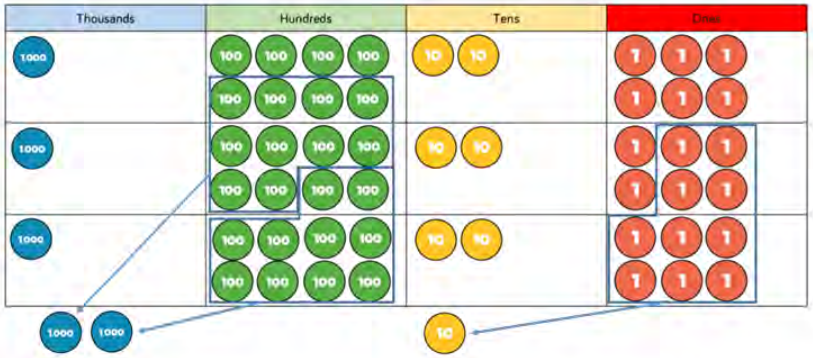
Skill	Year	Representations and models	
Solve one-step problems with multiplication	1/2	Bar model Number shapes Counters	Ten frames Bead strings Number lines
Multiply 2-digit by 1-digit numbers	3/4	Place value counters Base 10	Expanded written method Short written method
Multiply 3-digit by 1-digit numbers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

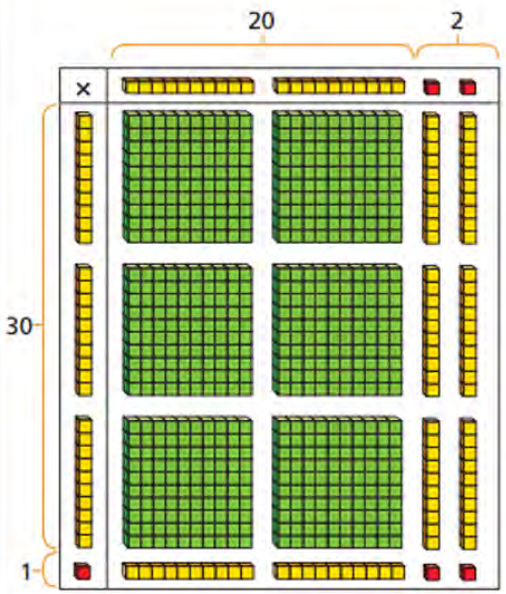
Skill	Year	Representations and models	
Multiply 2-digit by 2-digit numbers	5	Place value counters Base 10	Short written method Grid method
Multiply 2-digit by 3-digit numbers	5	Place value counters	Short written method Grid method
Multiply 2-digit by 4-digit numbers	5/6	Formal written method	

Skill: Solve 1-step problems using multiplication	Year: 1/2
	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
  $34 \times 5 = 170$  	Informal methods and the expanded method are used in Year 3 before moving on to the short multiplication method in Year 4. Place value counters should be used to support the understanding of the method rather than supporting the multiplication, as children should use times table knowledge.

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

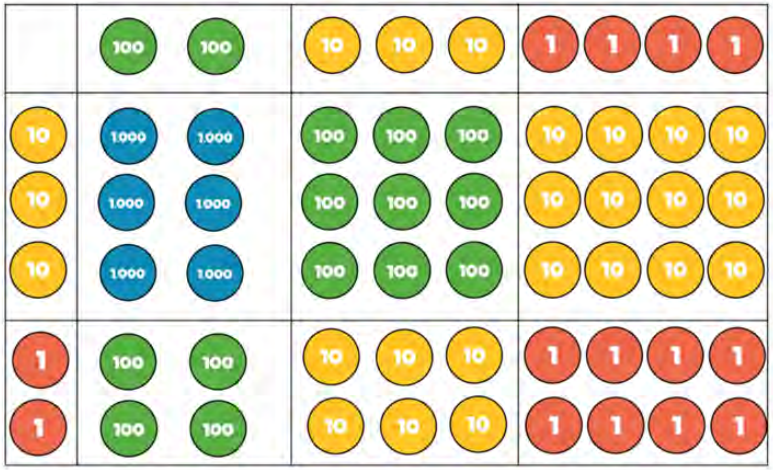
Skill: Multiply 4-digit numbers by 1-digit numbers	Year: 5
 $1{,}826 \times 3 = 5{,}478$ |	Th | H | T | O | |---|---|---|---|---| | | 1 | 8 | 2 | 6 | | × | | | | 3 | | | 5 | 4 | 7 | 8 | | | 2 | | 1 | |	When multiplying 4-digit numbers, place value counters are the best manipulative to use to support 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
  $22 \times 31 = 682$	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.

×	20	2
30	600	60
1	20	2

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

Skill: Multiply 3-digit numbers by 2-digit numbers	Year: 5



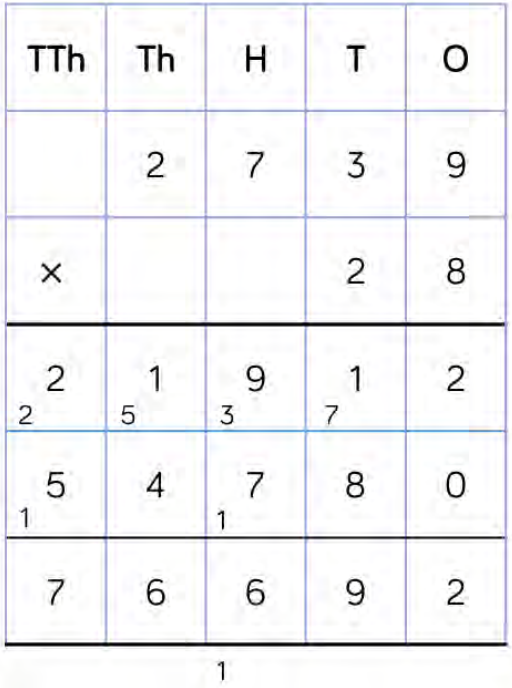
Th	H	T	O
	2	3	4
×		3	2
	4	6	8
^{1}	^{7}	^{1}0	2	0
7	4	8	8

×	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.

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

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

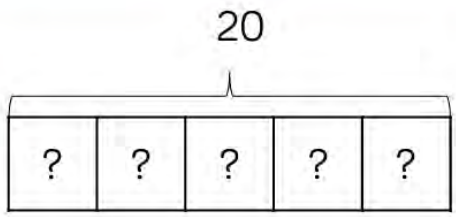
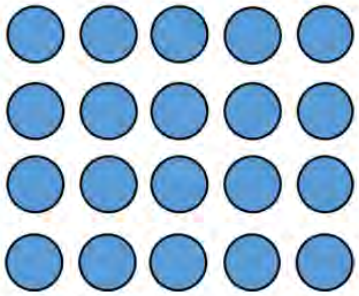
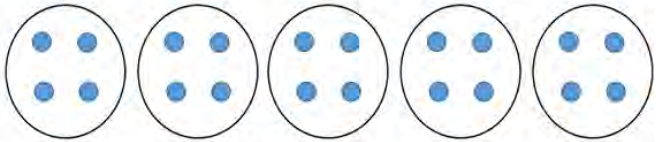
TTh	Th	H	T	O
	2	7	3	9
×			2	8
2 (2)	1 (5)	9 (3)	1 (7)	2
5 (1)	4	7 (1)	8	0
7	6	6	9	2
		1		

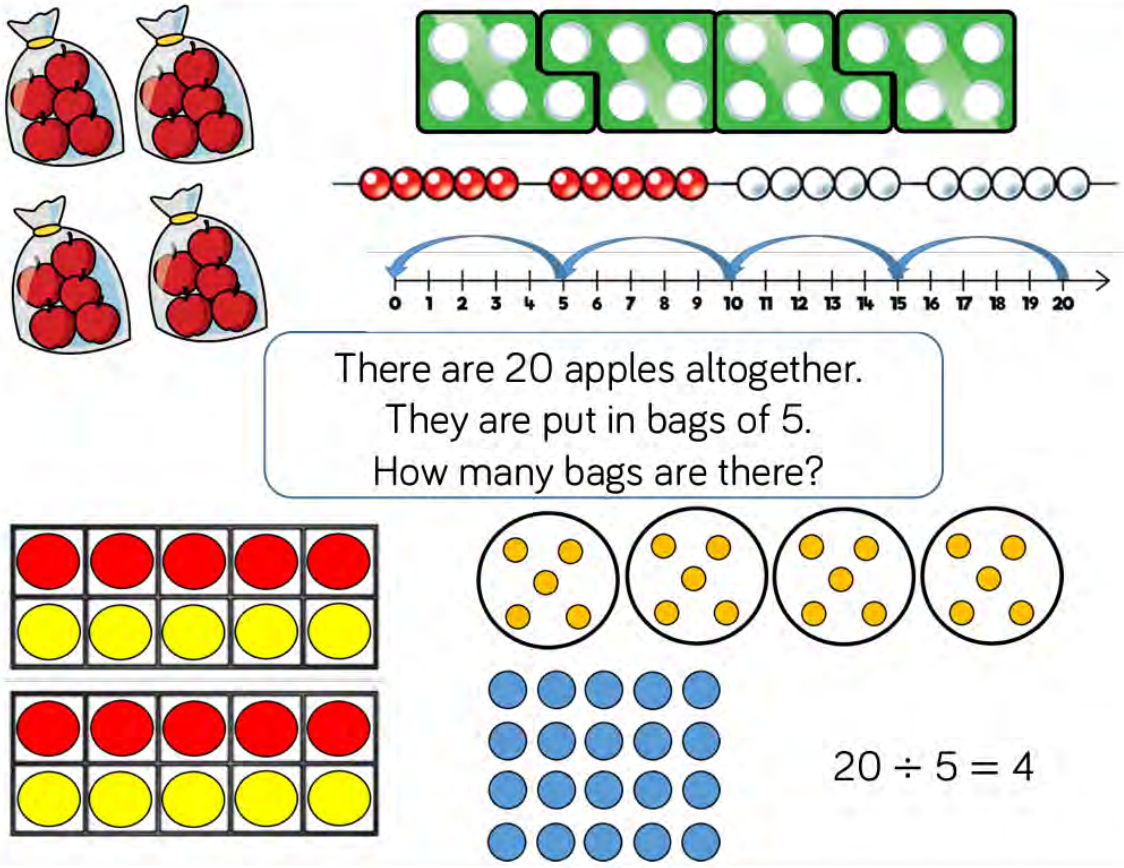
$2{,}739 \times 28 = 76{,}692$

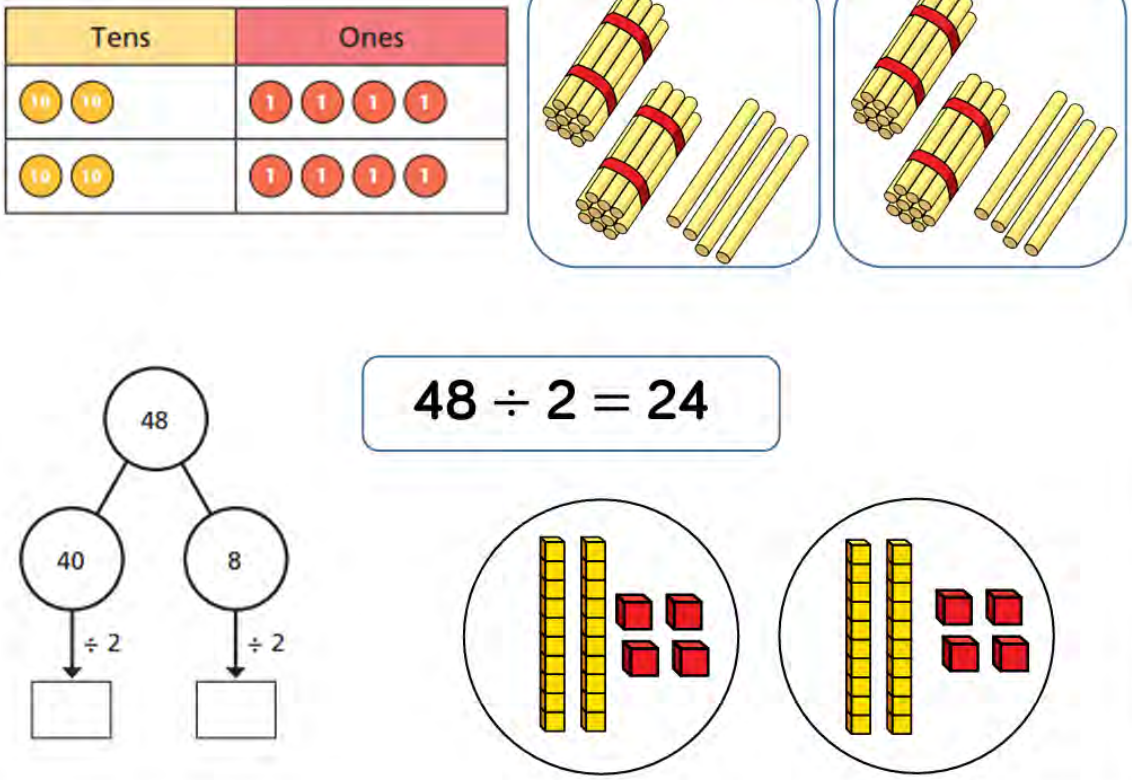
Skill	Year	Representations and models	
Solve one-step problems with division (sharing)	1/2	Bar model Real life objects	Arrays Counters
Solve one-step problems with division (grouping)	1/2	Real life objects Number shapes Bead strings Ten frames	Number lines Arrays Counters
Divide 2-digits by 1-digit (no exchange sharing)	3	Straws Base 10 Bar model	Place value counters Part-whole model
Divide 2-digits by 1-digit (sharing with exchange)	3	Straws Base 10 Bar model	Place value counters Part-whole model

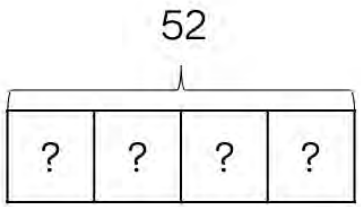
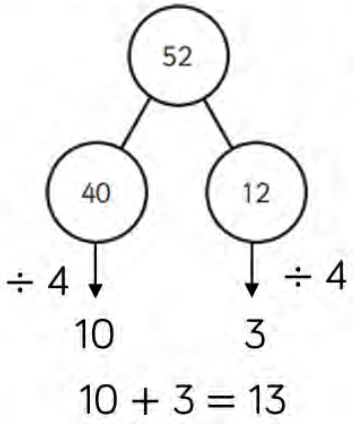
Skill	Year	Representations and models	
Divide 2-digits by 1-digit (sharing with remainders)	3/4	Straws Base 10 Bar model	Place value counters Part-whole model
Divide 2-digits by 1-digit (grouping)	4/5	Place value counters Counters	Place value grid Written short division
Divide 3-digits by 1-digit (sharing with exchange)	4	Base 10 Bar model	Place value counters Part-whole model
Divide 3-digits by 1-digit (grouping)	4/5	Place value counters Counters	Place value grid Written short division

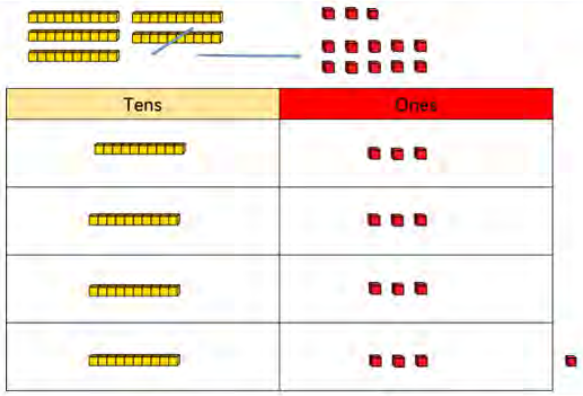
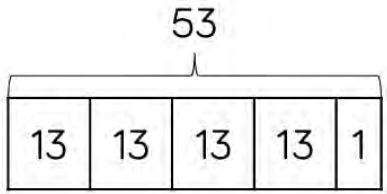
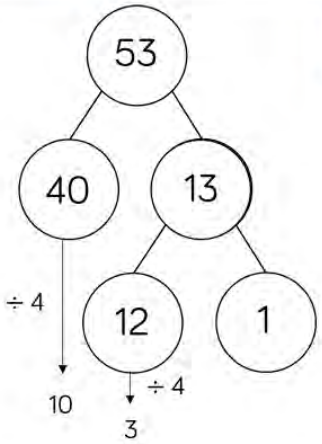
Skill	Year	Representations and models	
Divide 4-digits by 1-digit (grouping)	5	Place value counters Counters	Place value grid Written short division
Divide multi-digits by 2-digits (short division)	6	Written short division	List of multiples
Divide multi-digits by 2-digits (long division)	6	Written long division	List of multiples

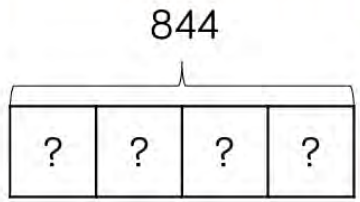
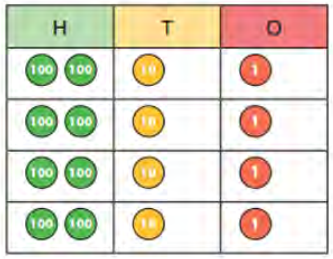
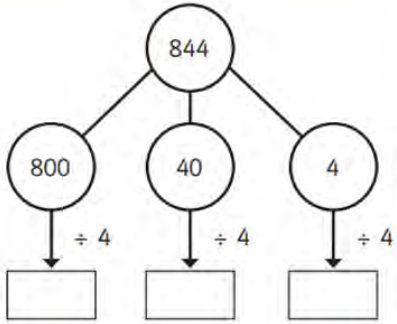
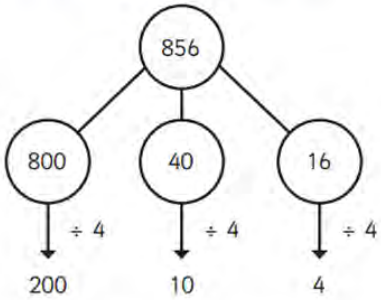
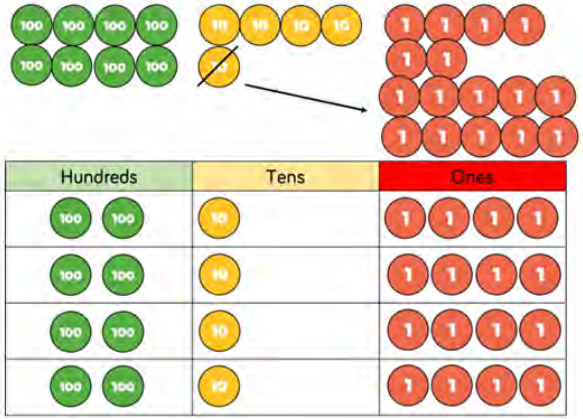
Skill: Solve 1-step problems using multiplication (sharing)	Year: 1/2
  There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag?   $20 \div 5 = 4$	Children solve problems by sharing amounts into equal groups. In Year 1, children use concrete and pictorial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

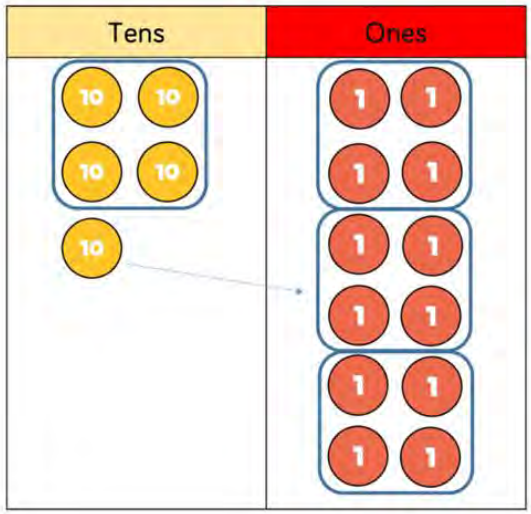
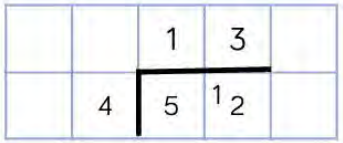
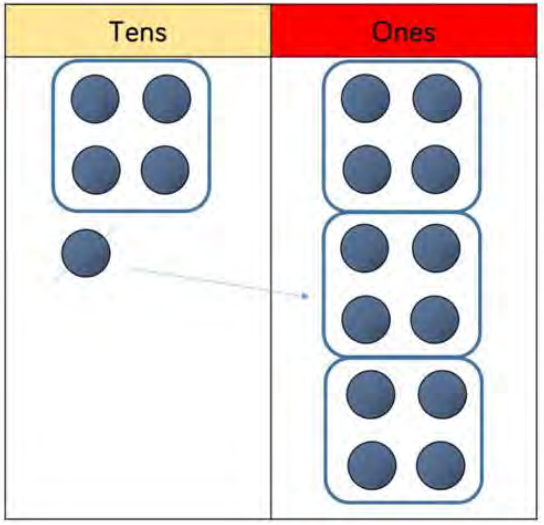
Skill: Solve 1-step problems using division (grouping)	Year: 1/2
	Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line. They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.

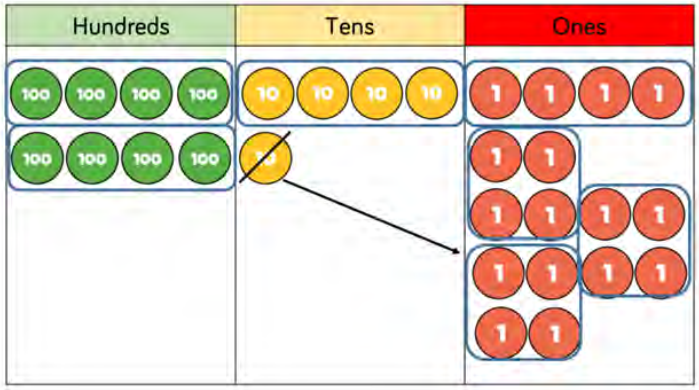
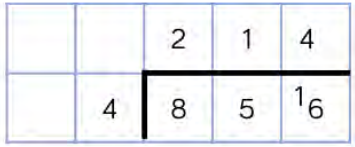
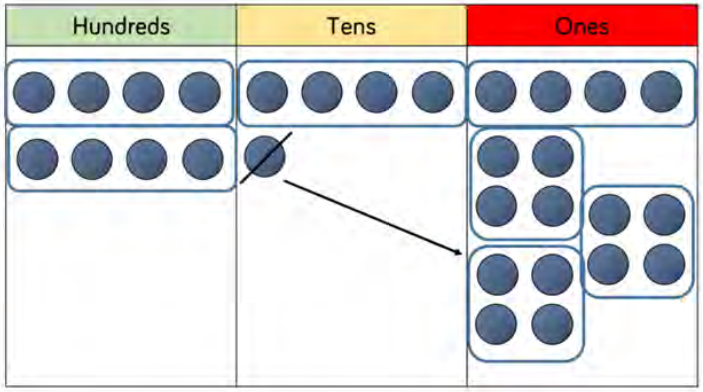
Skill: Divide 2-digits by 1-digit (sharing with no exchange)	Year: 3
	When dividing larger numbers, children can use manipulatives that allow them to partition into tens and ones. Straws, Base 10 and place value counters can all be used to share numbers into equal groups. Part-whole models can provide children with a clear written method that matches the concrete representation.

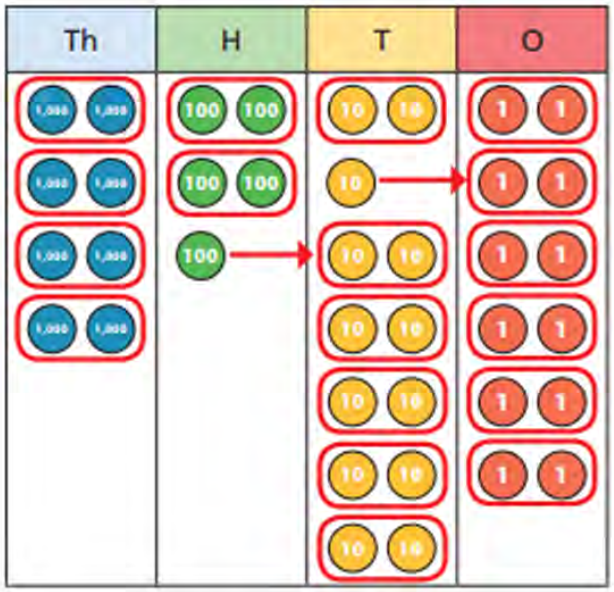
Skill: Divide 2-digits by 1-digit (sharing with exchange)	Year: 3/4
  **52 ÷ 4 = 13**  	When dividing numbers involving an exchange, children can use Base 10 and place value counters to exchange one ten for ten ones. Children should start with the equipment outside the place value grid before sharing 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.

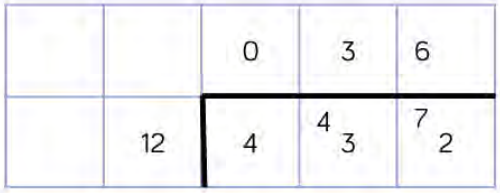
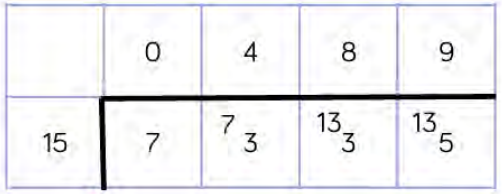
Skill: Divide 3-digits by 1-digit (sharing)	Year: 4
844 ÷ 4 = 211    **856 ÷ 4 = 214**  	Children can continue to use place value counters to share 3-digit numbers into equal groups. Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows. This method can also help to highlight remainders. Flexible partitioning in a part-whole model supports this method.

Skill: Divide 2-digits by 1-digit (grouping)	Year: 5
   $52 \div 4 = 13$	When using the short division method, children use grouping. Starting with the largest place value, they group by the divisor. Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?' Remainders can also be seen as they are left ungrouped.

Skill: Divide 3-digits by 1-digit (grouping)	Year: 5
   $856 \div 4 = 214$	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**  15 30 45 60 75 90 105 120 135 150	When children begin to divide up to 4-digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective. Children can write out multiples to support their calculations with larger remainders. Children will also solve problems with remainders where the quotient can be rounded as appropriate.

Skill: Divide multi-digits by 2-digits (long division)	Year: 6

		0	3	6
1	2	4	3	2
	–	3	6	0
			7	2
	–		7	2
				0

(×30)

(×6)

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

$432 \div 12 = 36$

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

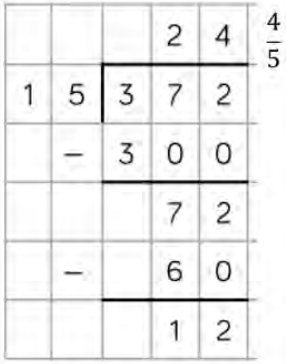
	0	4	8	9	
15	7	3	3	5	
–	6	0	0	0	(×400
	1	3	3	5	
–	1	2	0	0	(×80)
		1	3	5	
–		1	3	5	(×9)
				0	

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

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
$372 \div 15 = 24\ r12$  $1 \times 15 = 15$ $2 \times 15 = 30$ $3 \times 15 = 45$ $4 \times 15 = 60$ $5 \times 15 = 75$ $10 \times 15 = 150$  $372 \div 15 = 24\frac{4}{5}$	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.