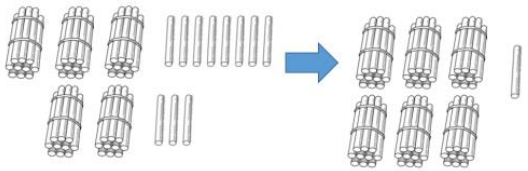
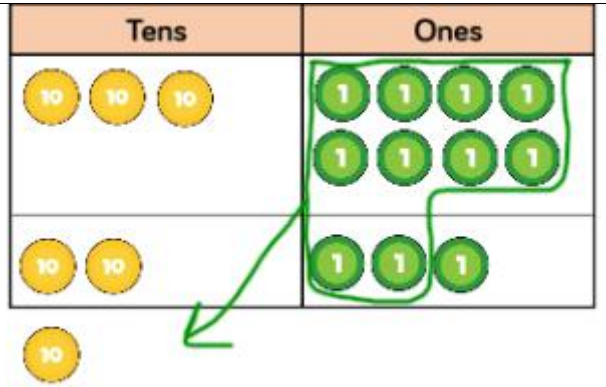
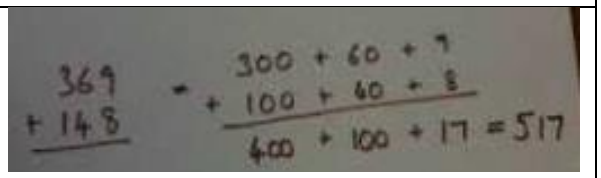
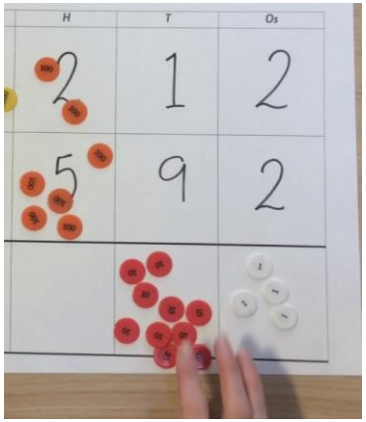
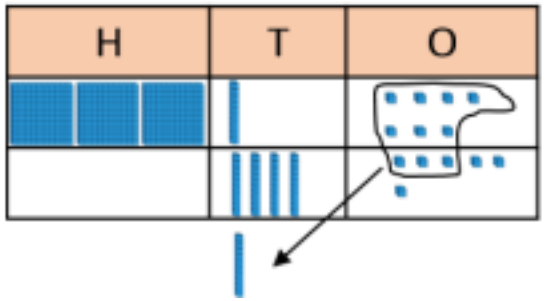
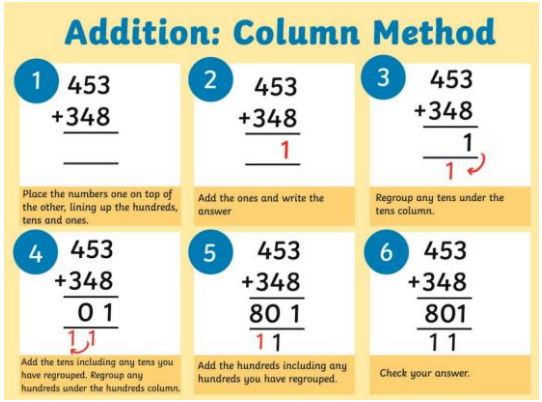
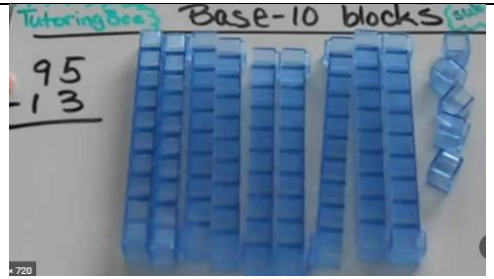
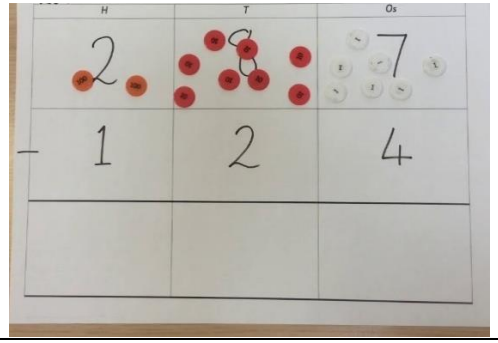
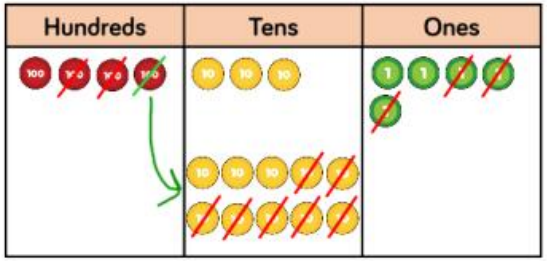
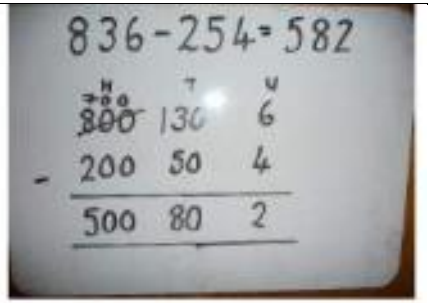
Year 3 - addition

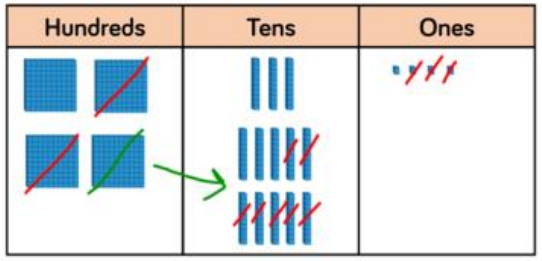
Objective/s	Concrete	Pictorial	Abstract
To add numbers with up to three digits, using formal written methods of columnar addition – numbers up to 1,000.	38 + 23 =  Use straws alongside the calculation to add. Children encouraged to use 'bunches' of ten when possible. This should progress onto using base 10 alongside the calculation when numbers get larger. Children should be taught when to exchange while	 Draw place value counters in a place value chart / be presented with pictures of place value counters in a place value chart to add. Children should be taught when to exchange – relating to their work in the concrete and be able to show this in their drawings. (Showing the abstract alongside the pictorial can help children make the connection).	 Start the formal written method by partitioning the numbers into clear place value columns (relating to the concrete and pictorial work). Children should be taught when to exchange and be able to show this in their calculations. 3 1 7 + 4 6 3 6 3 1

	exploring this practically, beginning with exchanging ten ones (progressing if children are secure).  Use place value counters alongside the calculation. Children should be taught when they need to exchange, beginning with exchanging ten ones (progressing if children are secure). Suggested time: Children must be secure adding using concrete resources before moving on to other methods (could need a whole week for this).	 Children draw or presented with pictures of base 10 to add. Children should be taught when to exchange – relating to their work in the concrete and be able to show this in their drawings. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 2 lessons with exchanging.	Children should progress on to the compact column method to add. Children should be taught when to exchange and be able to show this in their calculations. Possible rule to teach:  Suggested time: 2-3 lessons using the expanded columns method beginning without exchanging and progressing on to exchanging. 2-3 lessons using the compact column method beginning without exchanging and progressing on to exchanging. Some children may need the concrete/pictorial alongside the abstract.

KEY VOCABULARY	digits addition add more sum altogether total columnn method place value column exchange regroup

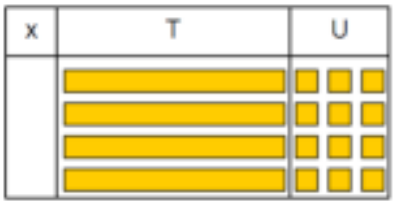
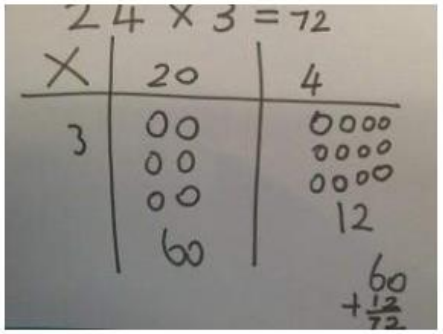
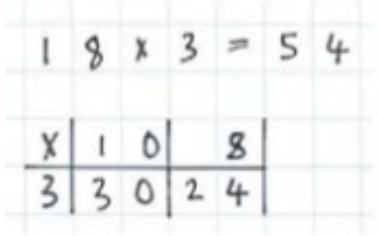
Year 3 - subtraction

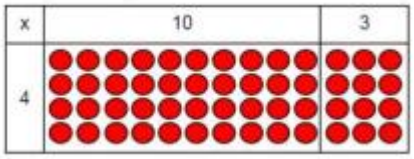
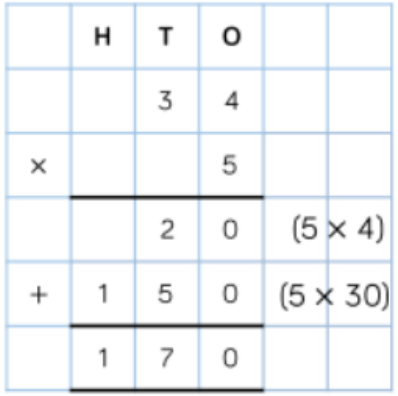
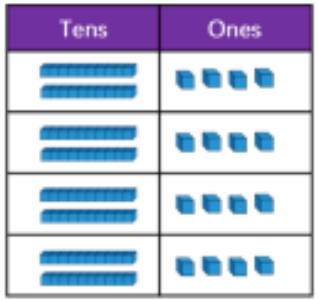
Objective/s	Concrete	Pictorial	Abstract
To subtract numbers with up to three digits, using formal written methods of columnar subtraction – numbers up to 1,000.	 Use base 10 alongside the calculation to subtract. Children should be taught when to exchange while exploring this practically, beginning with exchanging ten ones (progressing if children are secure). 	 Draw place value counters in a place value chart / be given pictures of place value counters in a place value chart to subtract. Children should be taught when to exchange – relating to their work in the concrete and be able to show this in their drawings. (Showing the abstract alongside the pictorial can help children make the connection).	 Start the formal written method by partitioning the numbers into clear place value columns (relating to the concrete and pictorial work). Children should be taught when to exchange and be able to show this in their calculations. $\begin{array}{r} {}^{3}\not{4}\,{}^{1}\not{3}5 \\ -\ 273 \\ \hline 262 \end{array}$ Children should progress on to the compact column method to subtract. Children should be taught when to

	Use place value counters alongside the calculation. Children should be taught when they need to exchange, beginning with exchanging ten and ones (progressing if children are secure). Suggested time: Children must be secure subtracting using concrete resources before moving on to other methods (could need a whole week for this).	 Given pictures of base 10 to subtract. Children should be taught when to exchange – relating to their work in the concrete and be able to show this in their drawings. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 2 lessons with exchanging.	exchange and be able to show this in their calculations. Possible rule to teach: **More on top?** Don't stop! 67 - 5 62 **More on the floor?** Pop next door to get 10 more! 66 - 9 57 **Are the numbers the same?** Zero's the game! 67 - 7 60 Suggested time: 2-3 lessons using the expanded columns method beginning without exchanging and progressing on to exchanging. 2-3 lessons using the compact column method beginning without exchanging and progressing on to exchanging. Some children may need the concrete/pictorial alongside the abstract.

KEY VOCABULARY	digits subtraction take away less fewer difference minus columnn method place value column exchange regroup

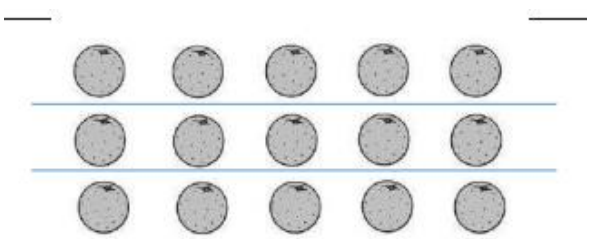
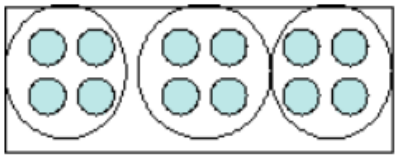
Year 3 - multiplication

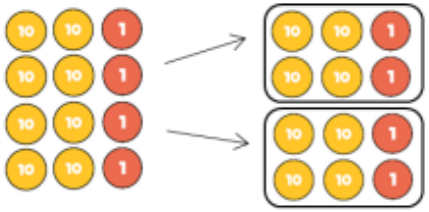
Objective/s	Concrete	Pictorial	Abstract
To multiply two-digit numbers by one-digit numbers, using (mental and progressing to) formal written methods. **(using times-table facts they are familiar with – see below)** **Year 2 – 2,5,10,3** **Year 3 – 4,8,6,11**	4 x 13 (four groups of 13)  Children use place value counters and/or base ten to show multiplication as repeated addition to multiply a two-digit number by a one-digit number. Children ***may*** be beginning to see when an exchange is needed and see that the exchanged value is added NOT multiplied but should find the answer by counting. (Showing the abstract alongside can help children make the connection). Suggested time: 1 lesson with exchanging, 1 lesson without exchanging.	2 x 34 =  Children then use their own place value counter drawings or drawings that are presented to them to multiply a two-digit number by a one-digit number (either through repeated addition or multiplication). Children ***may*** be beginning to see when an exchange is	 Use the grid as an abstract representation of the concrete and pictorial (arrays). Children ***may*** be beginning to see when an exchange is needed and see that the exchanged value is added NOT multiplied but should find the answer by counting. Some children will need pictorial / abstract alongside. Suggested time: Suggested time: 1 lesson with exchanging, 1 lesson without exchanging.

	13 x 4 =  This should progress on to making links to arrays from year 2 to show multiplication of a two-digit number by a one-digit number. Children should understand they need to count all of the counters to find the answer / add 40 to 12. Children ***may*** be beginning to see when an exchange is needed and see that the exchanged value is added NOT multiplied but should find the answer by counting. (Showing the abstract alongside can help children make the connection). Suggested time: until secure.	needed and see that the exchanged value is added NOT multiplied but should find the answer by counting. (Showing the abstract alongside can help children make the connection). Suggested time: until secure.	  ***<u>If secure</u>***, children MAY progress on to the expanded /compact column method to multiply a two-digit number by a one-digit number. It is always helpful to present the abstract along with concrete / pictorial to support children to understand the method.

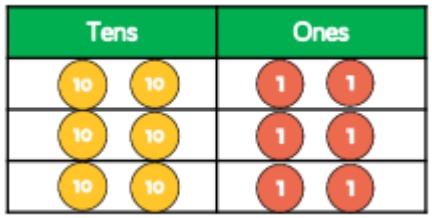
KEY VOCABULARY	digits multiplication multiply times array groups of lots of repeated addition product commutative column method place value column grid

Year 3 - division

Objective/s	Concrete	Pictorial	Abstract
To write and calculate mathematical statements for division **(using times-table facts they are familiar with – see below)** **Year 2 – 2,5,10,3** **Year 3 – 4,8,6,11)**	 Children explore arrays practically and are reminded of the inverse - using related multiplication facts to find division facts. E.g. if I know 5 x 3 = 15, I know 15 ÷ 5 = 3. Children know that dividing means sharing into equal groups. Suggested time: 1 lesson (recap from year 2 although some children may need longer). 84 ÷ 2 =	  Children draw their own arrays and use line to share into equal groups to find division facts. Some may also need to continue to use circles and drawings to share into equal groups (demonstrate how this method becomes more inefficient as the numbers get larger).	5 x 3 = 15 3 x 5 = 15 15 ÷ 5 = 3 15 ÷ 3 = 5 Children can find the inverse of known multiplication facts when presented with calculations. Suggested time: Suggested time: 1 lesson (recap from year 2 although some children may need longer). 29 ÷ 8 = 3 REMAINDER 5 Children are beginning to use known multiplication facts to realise when there is some 'left over' as a remainder.



66 ÷ 3=



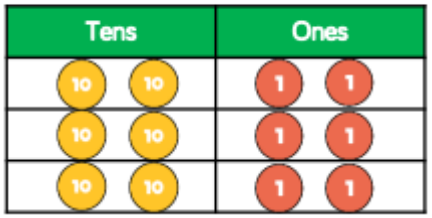
Children move on to dividing larger two-digit numbers (beyond their times table knowledge) by sharing base ten or place value counters into equal groups. The should share the tens into equal groups and then share the ones. Children are introduced to having some 'left over' as a remainder.

Suggested time: until secure.

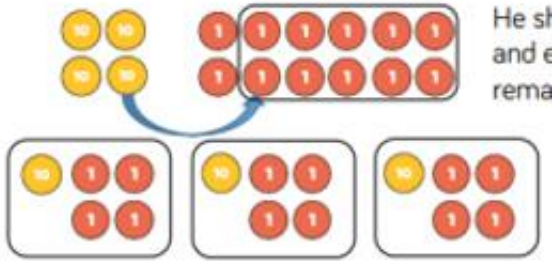
42 ÷ 3 =

Suggested time: Suggested time: 1 lesson (recap from year 2 although some children may need longer).

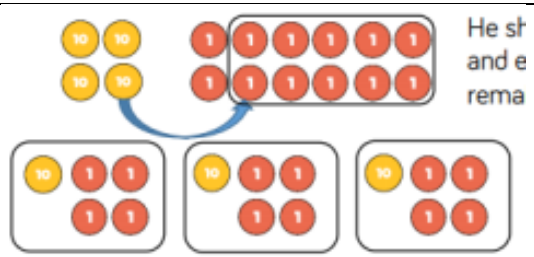
66 ÷ 3=



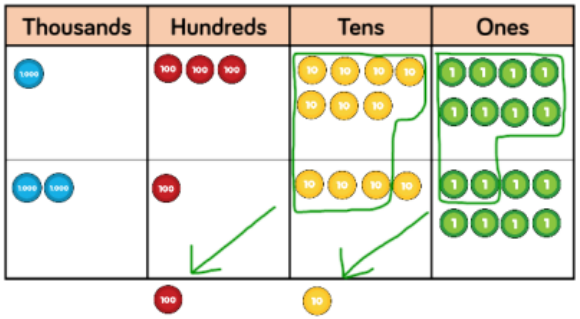
42 ÷ 3 =

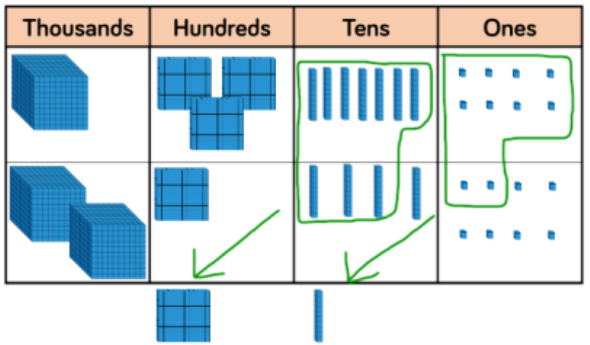


Children use their own drawings or drawings they are presented with to share tens and ones into equal groups (including when exchanging is necessary). Children are introduced to having some 'left over' as a remainder.

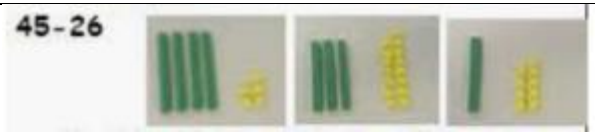
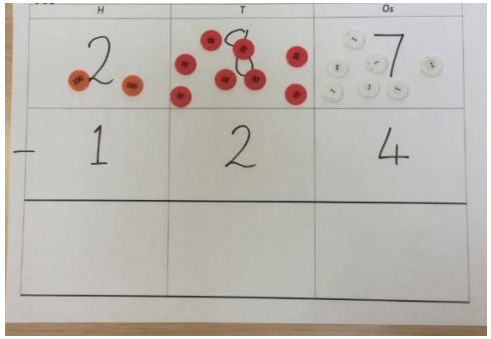
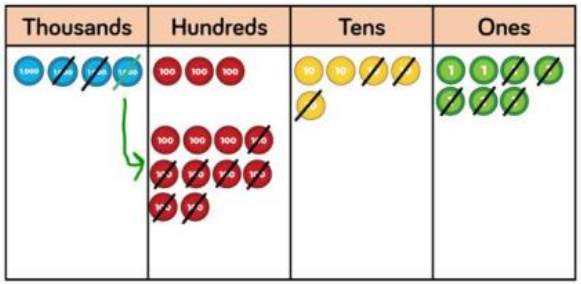
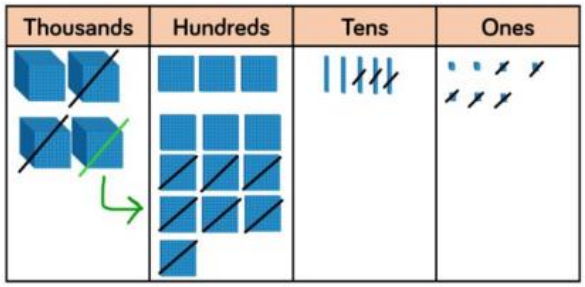
	 Children begin to understand that they can exchange a ten for ten ones to divide further and explore this practically. Children are introduced to having some 'left over' as a remainder. Suggested time: until secure.	Suggested time: until secure.	
KEY VOCABULARY	division divide share share into equal groups inverse remainder/left over array groups of/lots of		

Year 4 - addition

Objective/s	Concrete	Pictorial	Abstract
To add numbers with up to 4 digits using the formal written methods of columnar addition where appropriate– numbers up to 10,000.	Use place value counters alongside the calculation. Children should practise calculations that include more than one exchange, exchanging tens and hundreds (progressing if children are secure). Suggested time: 1 lesson without exchanging, 2 lessons with exchanging.	 Draw place value counters in a place value chart / be given pictures of place value counters in a place value chart to add. Children should be reminded when to exchange – relating to their work in the concrete and be able to show this in their drawings. (Showing the abstract alongside the pictorial can help children make the connection).	1 3 7 8 + 2 1 4 8 3 5 2 6 1 1 Use the column method to add. Children should be taught when to exchange (linking to their knowledge of the concrete and pictorial) and be able to show this in their calculations. Suggested time: Children should be secure using this method before moving into year 5 (could take a whole week). Some children may need the concrete/pictorial alongside the abstract.

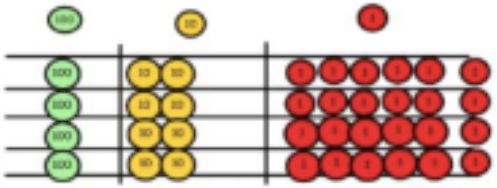
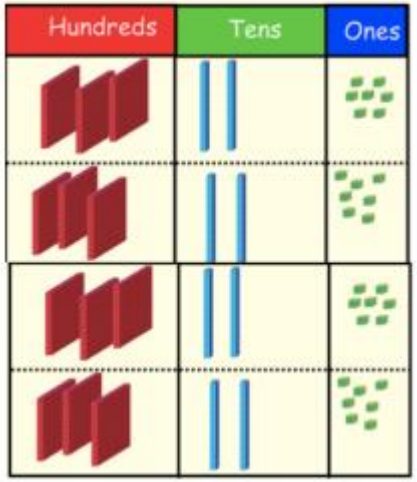
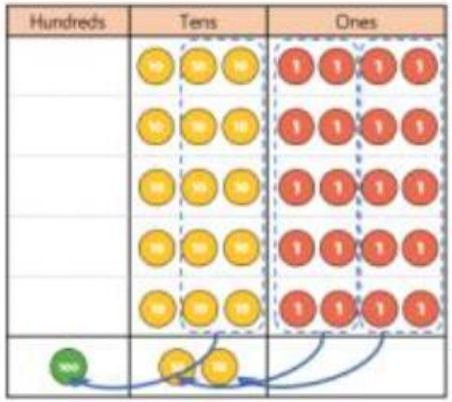
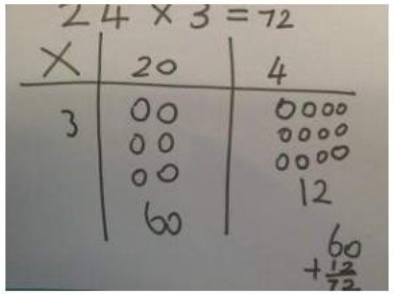
		 Given pictures of base 10 to add. Children should be reminded when to exchange – relating to their work in the concrete and be able to show this in their drawings. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 2 lessons with exchanging.	
KEY VOCABULARY	digits addition add more sum altogether total columnn method place value column exchange regroup commutative		

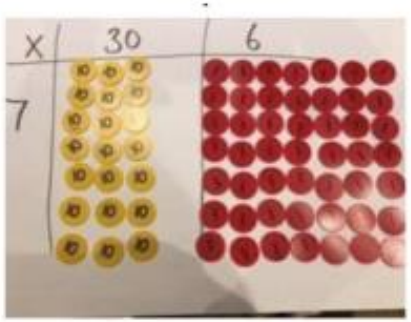
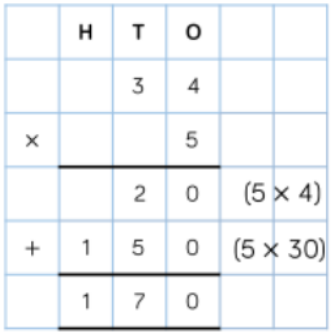
Year 4 - subtraction

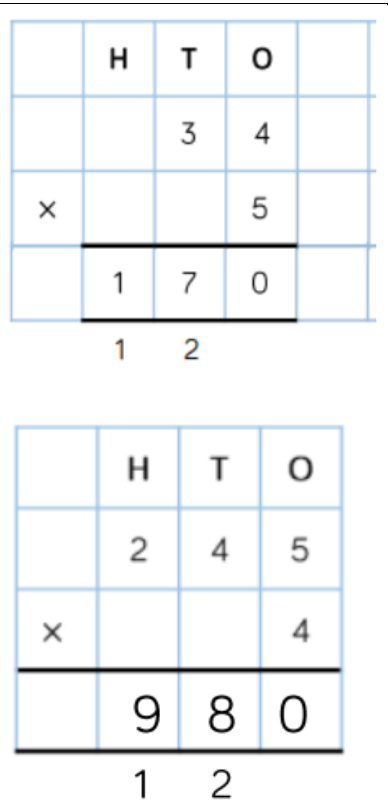
Objective/s	Concrete	Pictorial	Abstract
To subtract numbers with up to 4 digits using the formal written methods of columnar addition where appropriate– numbers up to 10,000.	 Use base ten to subtract alongside the calculation. Children should practise calculations that include more than one exchange, exchanging tens and hundreds (progressing if children are secure).  Use place value counters alongside the calculation. Children should practise	  Children draw / be given pictures of place value counters in a place value chart and base ten to subtract. Children should be reminded when to exchange – relating to their work in the concrete and be able to show this in their drawings.	$$\begin{array}{r} {}^{3}\not{4}\,{}^{1}357 \\ -\ 2735 \\ \hline 1622 \end{array}$$ Use the column method to subtract. Children should be taught when to exchange (linking to their knowledge of the concrete and pictorial) and be able to show this in their calculations. Suggested time: Children should be secure using this method before moving into year 5 (could take a whole week). Some children

	calculations that include more than one exchange, exchanging tens and hundreds (progressing if children are secure). Suggested time: 1 lesson without exchanging, 2 lessons with exchanging.	(Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 2 lessons with exchanging.	may need the concrete/pictorial alongside the abstract.
KEY VOCABULARY	digits subtraction take away less fewer difference minus columnn method place value column exchange		

Year 4 - multiplication

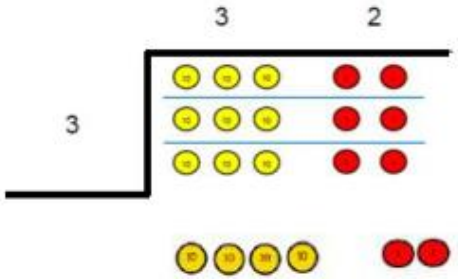
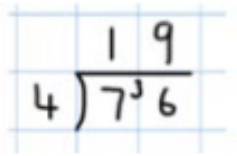
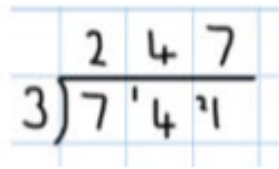
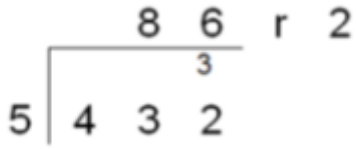
Objective/s	Concrete	Pictorial	Abstract
To multiply two-digit and three-digit numbers by a one-digit number using formal written layout.	4 x 126=  327 x 4 =  Use place value counters and/or base ten to show multiplication as repeated addition to multiply a two-digit or a	  Children then use their own place value counter drawings or drawings that are presented to them to multiply a two-digit or three-digit number by a one-	 210 + 35 = 245 Use the grid as an abstract representation of the concrete and pictorial. Children should be able to see when an exchange is needed when adding the multiplied values. Children need to be secure with multiplication fact e.g. knowing how to calculate 30 x 7. (Showing the column method alongside can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging (children should be secure using this method before moving on).

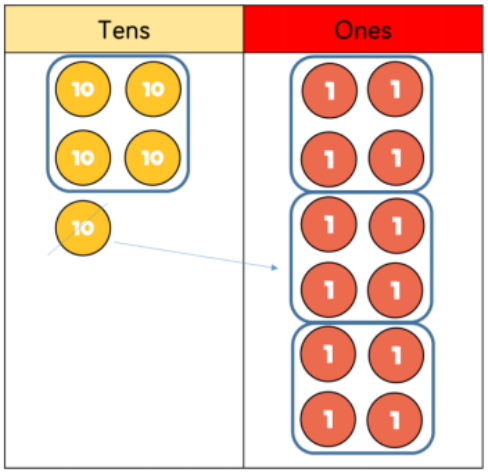
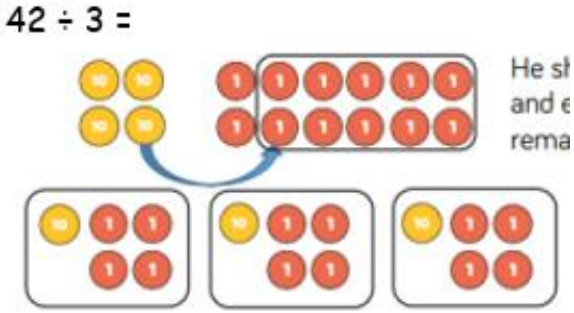
	three-digit number by a one-digit number. Children should be able to see when an exchange is needed and see that the exchanged value is added NOT multiplied. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging, beginning with 2-digits progressing to 3-digits. 36 X 7=  This should progress on to using place value counters shown as multiplication	digit number (either through repeated addition or multiplication). Children should be able to show when an exchange is needed and recognise that the exchanged value is added NOT multiplied. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging, beginning with 2-digits progressing to 3-digits.	 Children use expanded column method to multiply a two-digit or three-digit number by a one-digit number. Children should be able to show when an exchange is needed and know that the exchanged value is added NOT multiplied. Begin by showing the calculations at the side as a link to the grid method. Suggested time: 1 lesson without exchanging, 1 lesson with exchanging (children should be secure using this method before moving on), beginning with 2-digits progressing to 3-digits

	e.g. 30 x 7 ADD 6 x 7. Children should be able to see when an exchange is needed and see that the exchanged value is added NOT multiplied. Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.		 This should progress on to the compact column method to multiply two-digit and three-digit numbers by a one-digit number – showing exchanges where necessary.

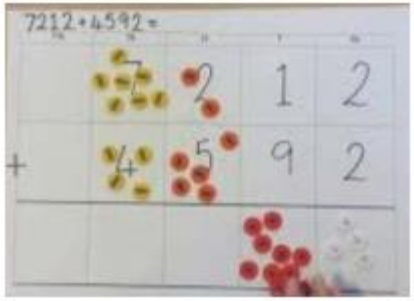
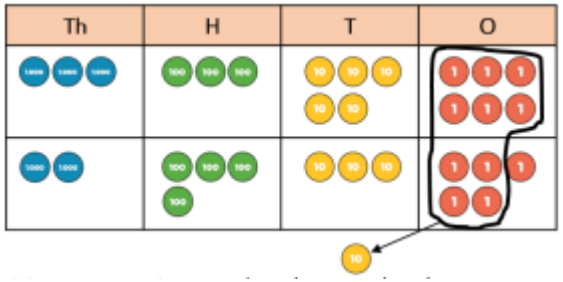
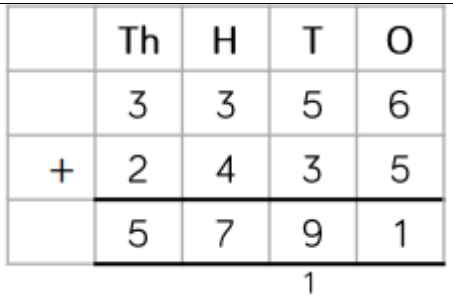
			Suggested time: 1 lesson without exchanging, 1 lesson with exchanging (preferred method for year 4/5).
KEY VOCABULARY	digits multiplication multiply times array groups of lots of repeated addition product commutative column method place value column grid		

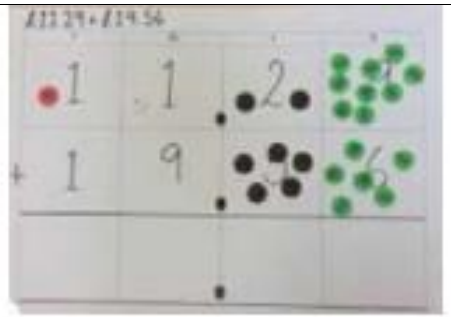
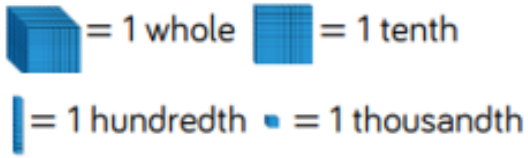
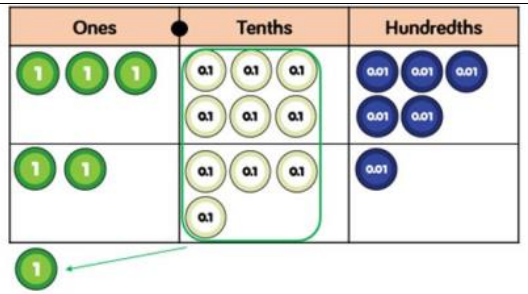
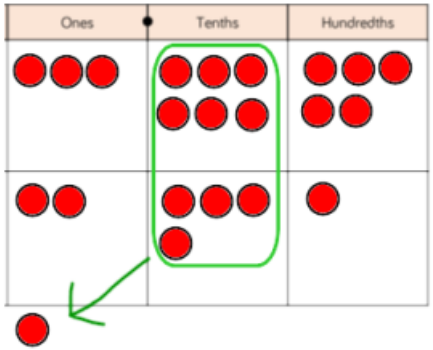
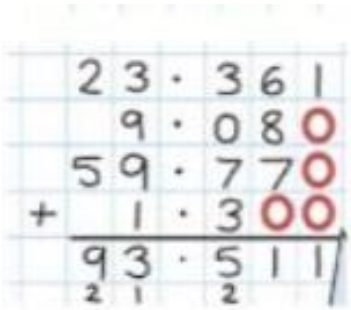
Year 4 - division

Objective/s	Concrete	Pictorial	Abstract
To divide two-digit and three-digit numbers by a one-digit number – non-statutory **To practise becoming fluent in the formal written method of short division with exact answers – non-statutory**	 Children use place value counters (alongside the abstract) – sharing hundreds, tens then ones - beginning with calculations that don't involve exchanging. Children realise that some can be 'left over' as a remainder. Suggested time: until secure.	 Children draw or are presented with pictures of place value counters. Children share into equal groups – sharing hundreds, tens then ones, beginning with calculations that don't involve exchanging. Children realise that some can be 'left over' as a remainder.	  Children are introduced to the formal written method of short division alongside the pictorial and abstract. Children should begin with calculation that require one exchange, moving on to calculations that require more than one.  Children can show that some division problems have a remainder. Suggested time: 2 lessons, one without exchanging, one with exchanging.

	 Children use place value counters to share larger numbers into equal groups, recognising that if there are tens or hundreds 'left over' these can be exchanged and then shared. Suggested time: until secure.	 Children use their own drawings or drawings they are presented with to share hundreds, tens and ones into equal groups (including when exchanging is necessary). Children realise there are sometimes some 'left over' as a remainder. Suggested time: 2 lessons, one without exchanging, one with exchanging.	
KEY VOCABULARY	division divide share share into equal groups remainder/left over groups of/lots of		

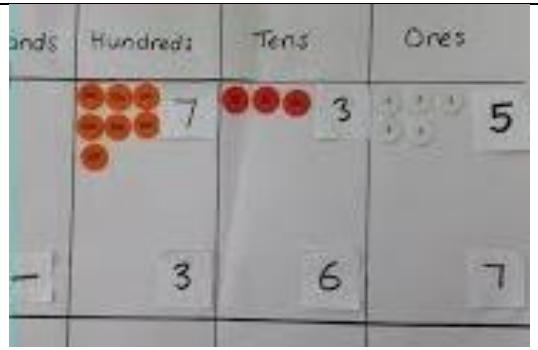
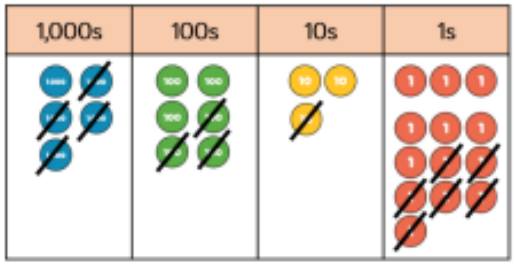
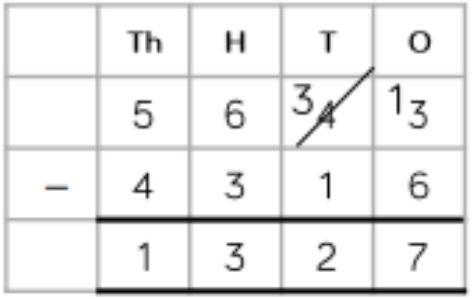
Year 5 - addition

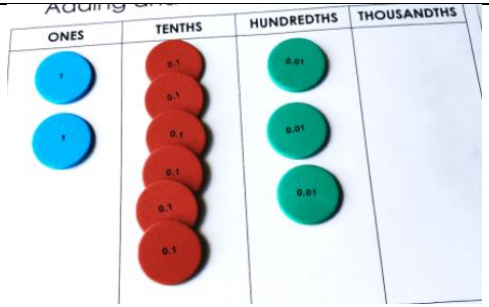
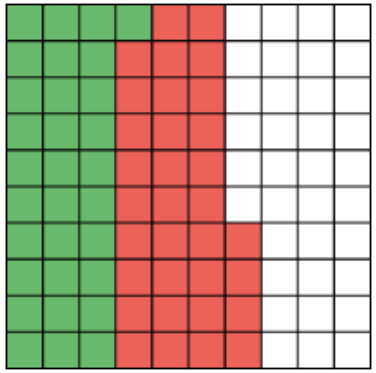
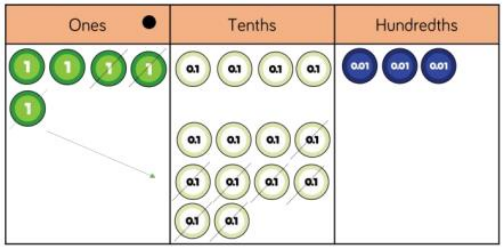
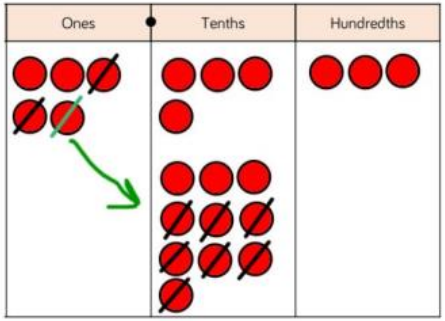
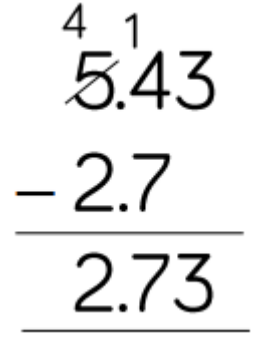
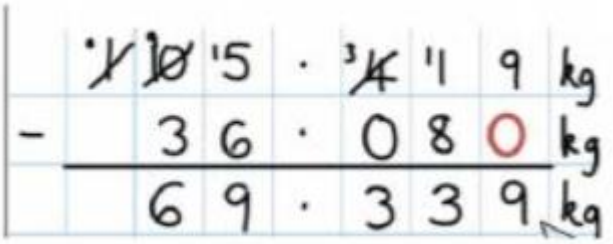
Objective/s	Concrete	Pictorial	Abstract
To add whole numbers with more than 4 digits, including using formal written methods (columnar addition) – numbers up to 1,000,000.	 Use place value counters along side the calculation. Children should know when to exchange. Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	 Draw place value counters in a place value chart to add. Children should know when to exchange and be able to show this in their drawings. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	 Use the column method to add. Children should know when to exchange and be able to show this in their calculations. Suggested time: 1 lesson without exchanging, 1 lesson with one exchange, 1 lesson with multiple exchanges. This should be taught until children are secure – preferred method for upper KS2.

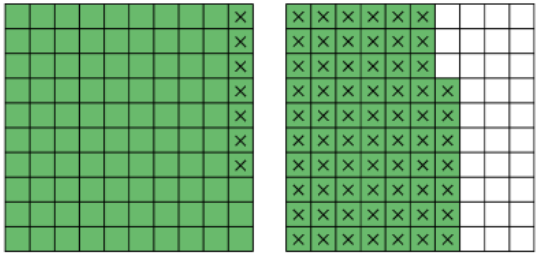
To practise adding decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 (for example, 0.83 + 0.17 = 1) – non-statutory – decimals with up to 3 decimal places.	 Use place value counters alongside the calculation. Children should know when to exchange.  Use base 10 (using the representations above) to add decimals. Children will first need to be taught how to represent decimals using base 10. Children should know when to exchange.	  Draw place value counters in place value chart to add decimals. Children should know when to exchange and be able to show this in their drawings. (Showing the abstract alongside the pictorial can help children make the connection).	3.65 + 2.41 6.06 1 Use the column method to add decimals. Children should know when to exchange and be able to show this in their calculations.  Children could be taught how to use 0 as a place holder when adding decimals. Possible rule to teach:

	(Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	 Use pictures of base 10 to add decimals. Children should know when to exchange. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	 Suggested time: 1 lesson without exchanging, 1 lesson with one exchange, 1 lesson with multiple exchanges. This should be taught until children are secure – preferred method for upper KS2.
KEY VOCABULARY	digits addition add more sum altogether total columnn method place value column exchange regroup decimal decimal point decimal places commutative		

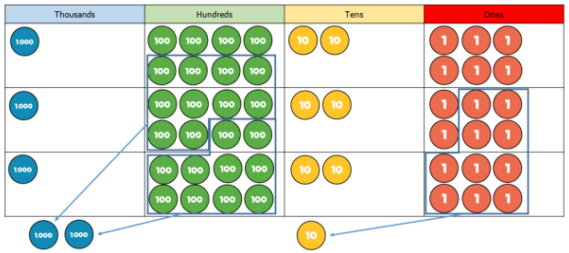
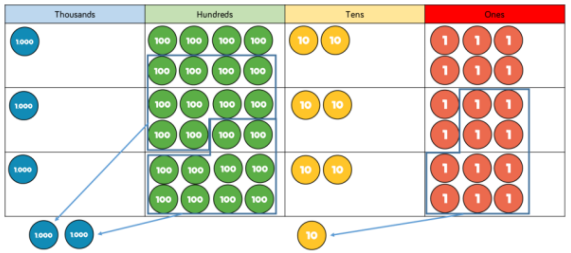
Year 5 - subtraction

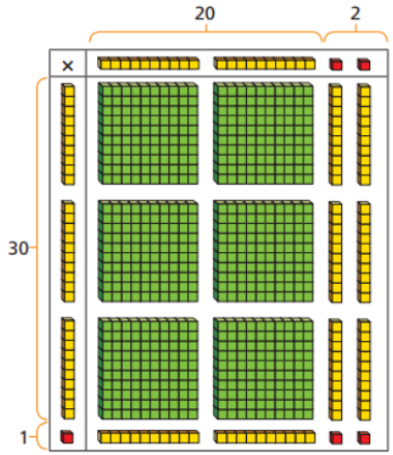
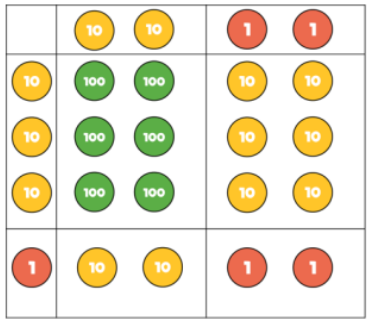
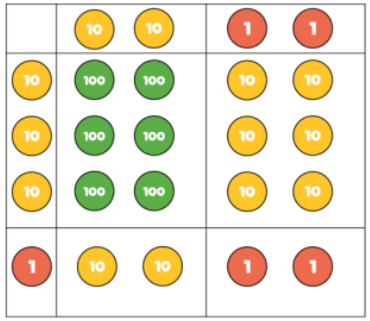
Objective/s	Concrete	Pictorial	Abstract
To subtract whole numbers with more than 4 digits, including using formal written methods (columnar subtraction) – numbers up to 1,000,000.	 Use place value counters alongside the calculation. Children should know when to exchange. Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	5643 – 4316 =  Draw place value counters in a place value chart to subtract. Children should know when to exchange and be able to show this in their drawings. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	 Use the column method to add. Children should know when to exchange and be able to show this in their calculations. Suggested time: 1 lesson without exchanging, 1 lesson with one exchange, 1 lesson with multiple exchanges. This should be taught until children are secure – preferred method for upper KS2.

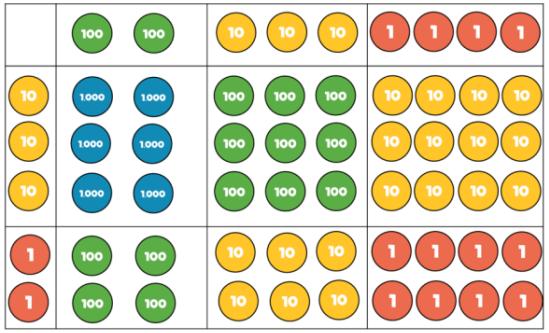
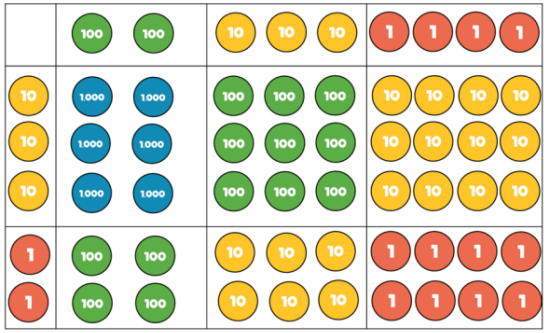
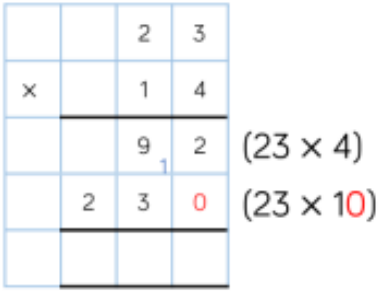
To practise subtracting decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 (for example, 1 - 0.83 = 0.17) – non-statutory – decimals with up to 3 decimal places.	 Use place value counters alongside the calculation. Children should know when to exchange.  $0.64 - 0.33 = ?$ Use base 10 to subtract decimals. Children will first need to be	  Draw place value counters in place value chart to subtract decimals. Children should know when to exchange and be able to show this in their drawings. (Showing the abstract alongside the pictorial can help children make the connection).	 Use the column method to subtract decimals. Children should know when to exchange and be able to show this in their calculations.  Children could be taught how to use 0 as a place holder when subtracting decimals. Suggested time: 1 lesson without exchanging, 1 lesson with one exchange, 1 lesson with multiple exchanges. This

	taught how to represent decimals using base 10. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	1.67 – 0.74 =  Use pictures of base 10 to subtract decimals. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	should be taught until children are secure – preferred method for upper KS2.
KEY VOCABULARY	digits subtraction take away less fewer difference minus columnn method place value column exchange regroup decimal decimal point decimal places		

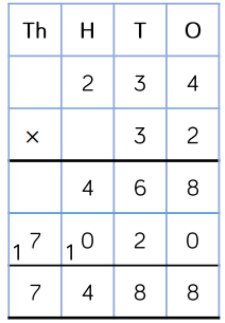
Year 5 - multiplication

Objective/s	Concrete	Pictorial	Abstract
To multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers	 Use place value counters as repeated addition to multiply a four-digit number by a one-digit number. Children should be able to see when an exchange is needed and see that the exchanged value is added NOT multiplied. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson.	 Children then use their own drawings or drawings that are presented to them to multiply a four-digit number by a one-digit number. Children should be able to show when an exchange is needed and recognise that the exchanged value is added NOT multiplied. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson.	 Children use the column method to multiply a four-digit number by a one-digit number. Children should be able to show when an exchange is needed and know that the exchanged value is added NOT multiplied. Suggested time: Children need to be secure with this method before moving on to multiplying 2-digits by 2-digits – preferred method for upper KS2.

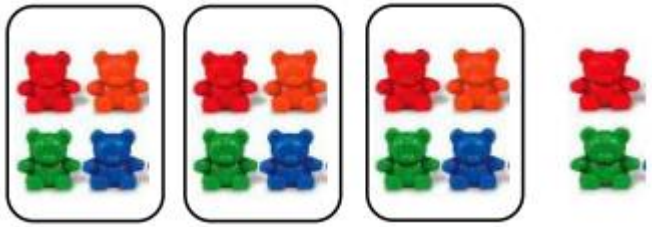
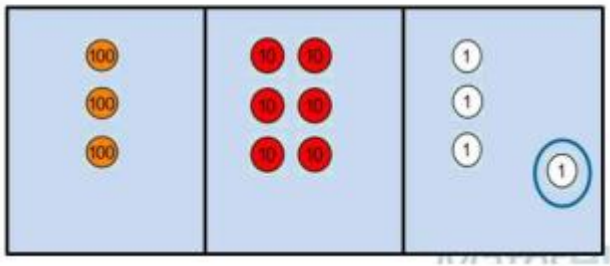
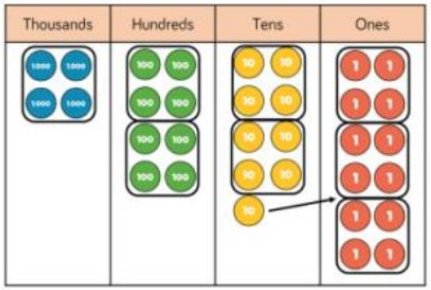
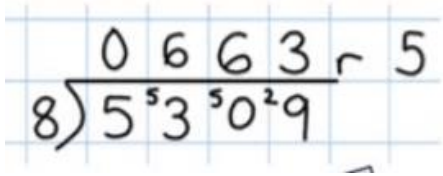
	  Use dienes and/or place value counters to show multiplying a two-digit number by a two-digit number. Children should be able to see when an exchange is needed when adding the multiplication answers. Children need	 Children draw / presented with place value counters to show multiplying a two-digit number by a two-digit number. Children should be able to see when an exchange is needed when adding the multiplication answers. Children need to be secure with multiplication fact e.g. knowing how to calculate 20 x 30. (Showing the abstract alongside the pictorial can help children make the connection – showing the grid will help make the clearest connection here). Suggested time: 1 lesson.	<table><tr><td>×</td><td>20</td><td>2</td></tr><tr><td>30</td><td>600</td><td>60</td></tr><tr><td>1</td><td>20</td><td>2</td></tr></table> Use the grid as an abstract representation of the concrete and pictorial. Children should be able to see when an exchange is needed when adding the multiplication answers. Children need to be secure with multiplication fact e.g. knowing how to calculate 20 x 30. (Showing the column method alongside this can help children make the connection). Suggested time: 2/3 lessons – children should be secure using this method before moving on to the column method.

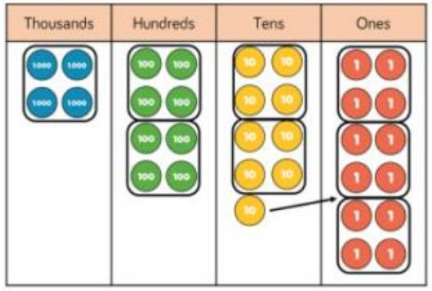
	to be secure with multiplication fact e.g. knowing how to calculate 20 x 30. (Showing the abstract alongside the pictorial can help children make the connection – showing the grid will help make the clearest connection here). Suggested time: 1 lesson.  This should progress on to using place value counters to show multiplying a three-digit or four-digit number by a two-digit number. Children should be able to see when an exchange is needed when adding the multiplication answers.	 This should progress on to drawing/using drawings of place value counters to show multiplying a three-digit or four-digit number by a two-digit number. Children should be able to see when an exchange is needed when adding the multiplication answers. (Showing the abstract alongside the pictorial can help children make the connection – showing the grid will help make the clearest connection here). Suggested time: 1 lesson for three-digits, 1 lesson for four-digits.	18 x 13 24 (3 x 8) 30 (3 x 10)) 80 (10 x 8) 100 (10 x 10) 234 The grid should progress on to using the expanded column method - the calculations at the side as a link to the grid. Suggested time: 1/2 lessons.  (23 x 4) (23 x 10)

	(Showing the abstract alongside the pictorial can help children make the connection – showing the grid will help make the clearest connection here). Suggested time: 1 lesson for three-digits, 1 lesson for four-digits.		This should progress on to using the compact column method (the calculations at the side as a link to the grid – once secure, these can be left out). Suggested time: 2/3 lessons – children should be secure using this method before moving in to year 6 and before moving on to multiplying a three-digit or four-digit number by a two-digit number. × | 200 | 30 | 4 30 | 6,000 | 900 | 120 2 | 400 | 60 | 8

			 This should be repeated for multiplying a three-digit or four-digit number by a two-digit number. Suggested time: 2/3 lessons for three-digits, 2/3 lessons for four-digits. Children should be secure using this method before moving in to year 6.
KEY VOCABULARY	digits multiplication multiply times array groups of lots of repeated addition product commutative column method place value column grid		

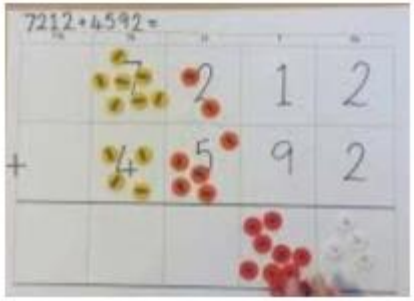
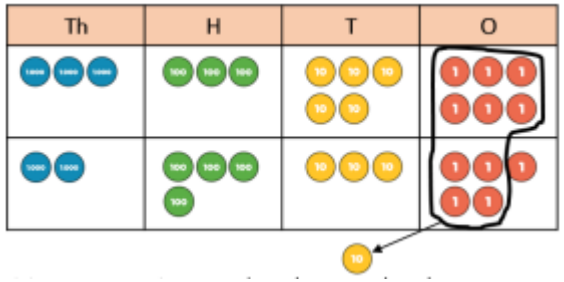
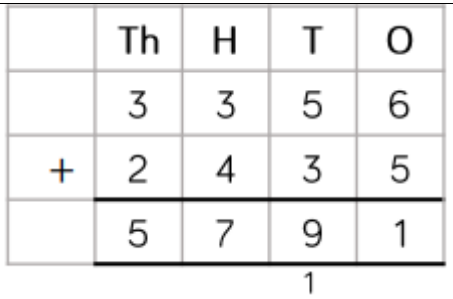
Year 5 - division

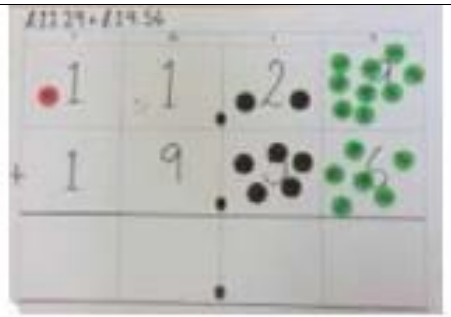
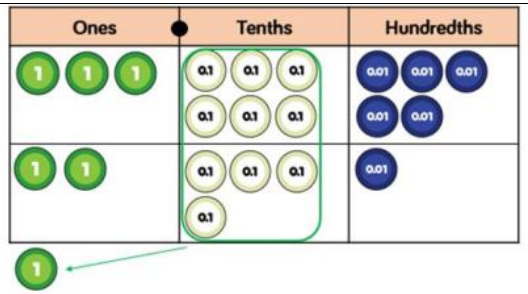
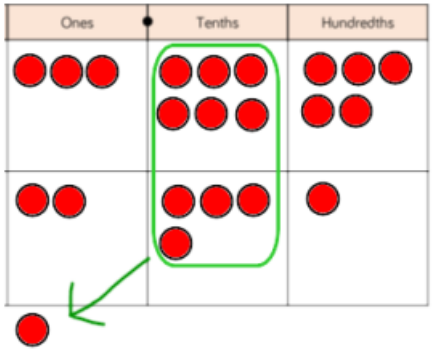
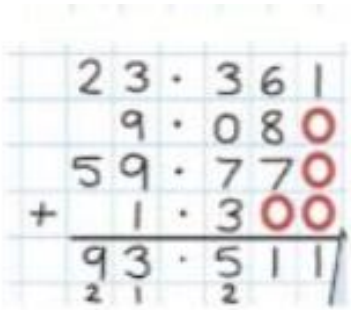
Objective/s	Concrete	Pictorial	Abstract
To divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	 Children use objects to share into equal groups to re-introduce remainders. Suggested time: recap. 364 ÷ 3 = 1 2 1 rem 1 3 | 3 6 4 	 Children draw equal groups to reintroduce remainders. Suggested time: recap.  1223 4 | 4892 Children use their own drawings or drawings they are presented with to share thousands, hundreds, tens and ones into equal groups (including when exchanging is	 Children are introduced to the formal written method of short division alongside the pictorial and abstract. Children should begin with calculations that require one exchange, moving on to calculations that require more than one. This should include problems that have remainders (some problems may require the remainder to be presented in fraction form). Suggested time: until secure (preferred method for upper KS2).

	Children use place value counters (alongside the abstract) – sharing hundreds, tens then ones - beginning with calculations that don't involve exchanging. Children realise are taught that there can be remainders. Suggested time: 1 / 2 lessons).  $4\overline{)4892}$ = 1223 Children use place value counters (alongside the abstract) to share larger numbers into equal groups, recognising that if there are remainders, these can be exchanged and then shared. Suggested time: 1 / 2 lessons, beginning with simpler divisions.	necessary). This should also include divisions that have a remainder. Suggested time: 1 / 2 lessons, beginning with simpler divisions.	

KEY VOCABULARY	division divide share share into equal groups remainder/left over groups of/lots of

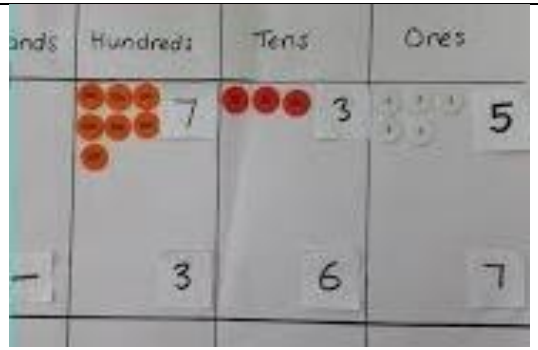
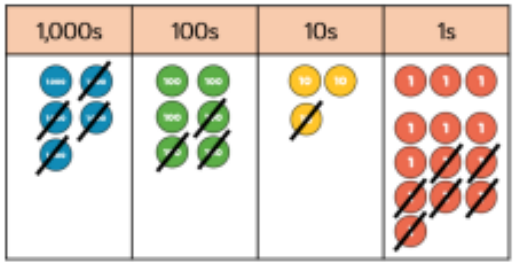
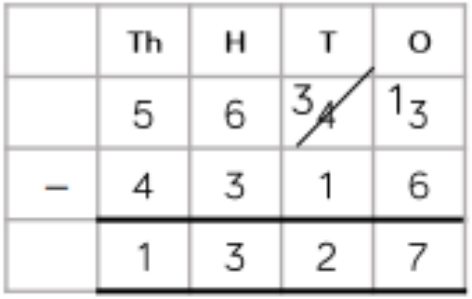
Year 6 - addition

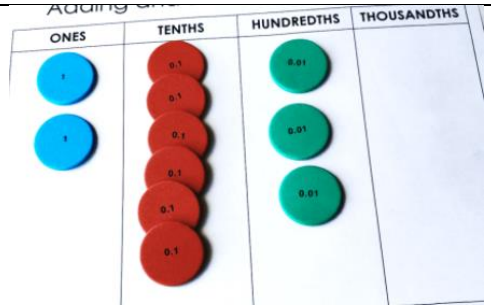
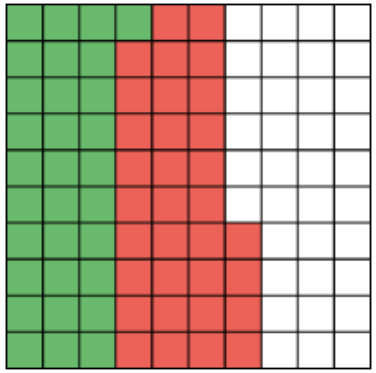
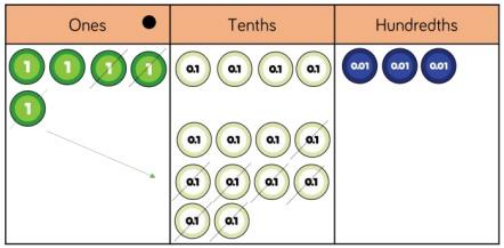
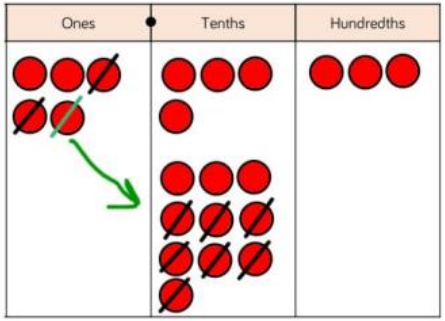
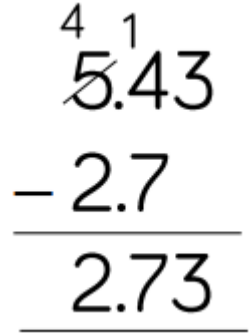
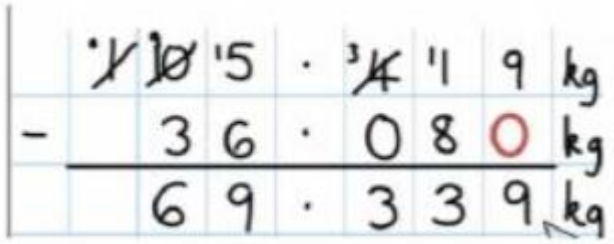
Objective/s	Concrete	Pictorial	Abstract
To practise addition with larger numbers, using the formal written methods of columnar addition – numbers up to 10,000,000.	 Use place value counters along side the calculation. Children should know when to exchange. Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	 Draw place value counters in a place value chart to add. Children should know when to exchange and be able to show this in their drawings. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	 Use the column method to add. Children should know when to exchange and be able to show this in their calculations. Suggested time: 1 lesson without exchanging, 1 lesson with one exchange, 1 lesson with multiple exchanges. This should be taught until children are secure – preferred method for upper KS2.

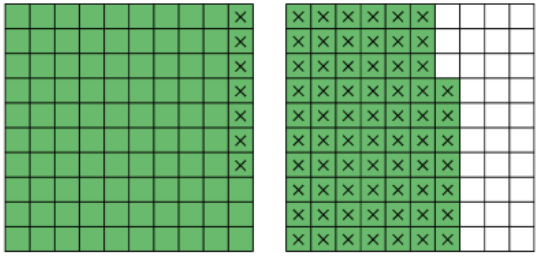
To practise calculations using decimal fraction equivalents to aid fluency.	 Use place value counters alongside the calculation. Children should know when to exchange. = 1 whole = 1 tenth = 1 hundredth = 1 thousandth Use base 10 (using the representations above) to add decimals. Children will first need to be taught how to represent decimals using base 10. Children should know when to exchange.	  Draw place value counters in place value chart to add decimals. Children should know when to exchange and be able to show this in their drawings. (Showing the abstract alongside the pictorial can help children make the connection).	3.65 + 2.41 6.06 1 Use the column method to add decimals. Children should know when to exchange and be able to show this in their calculations.  Children could be taught how to use 0 as a place holder when adding decimals. Possible rule to teach:

	(Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	 Use pictures of base 10 to add decimals. Children should know when to exchange. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	 Suggested time: 1 lesson without exchanging, 1 lesson with one exchange, 1 lesson with multiple exchanges. This should be taught until children are secure – preferred method for upper KS2.
KEY VOCABULARY	digits addition add more sum altogether total columnn method place value column exchange regroup decimal decimal point decimal places commutative		

Year 6 - subtraction

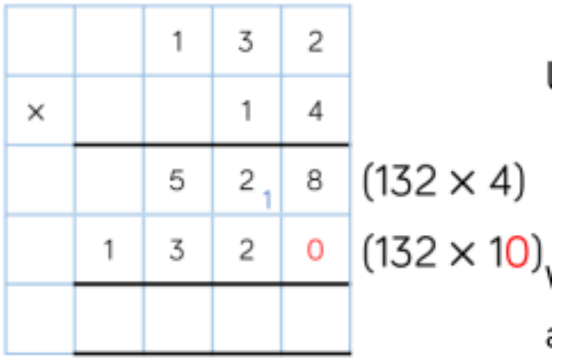
Objective/s	Concrete	Pictorial	Abstract
To practise subtraction with larger numbers, using the formal written methods (columnar subtraction) – numbers up to 10,000,000.	 Use place value counters alongside the calculation. Children should know when to exchange. Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	5643 – 4316 =  Draw place value counters in a place value chart to subtract. Children should know when to exchange and be able to show this in their drawings. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	 Use the column method to add. Children should know when to exchange and be able to show this in their calculations. Suggested time: 1 lesson without exchanging, 1 lesson with one exchange, 1 lesson with multiple exchanges. This should be taught until children are secure – preferred method for upper KS2.

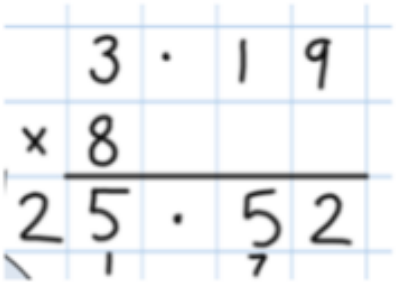
To practise calculations using decimal fraction equivalents to aid fluency.	 Use place value counters alongside the calculation. Children should know when to exchange.  $0.64 - 0.33 = ?$ Use base 10 to subtract decimals. Children will first need to be	  Draw place value counters in place value chart to subtract decimals. Children should know when to exchange and be able to show this in their drawings. (Showing the abstract alongside the pictorial can help children make the connection).	 Use the column method to subtract decimals. Children should know when to exchange and be able to show this in their calculations.  Children could be taught how to use 0 as a place holder when subtracting decimals. Suggested time: 1 lesson without exchanging, 1 lesson with one exchange, 1 lesson with multiple exchanges. This

	taught how to represent decimals using base 10. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	1.67 – 0.74 =  Use pictures of base 10 to subtract decimals. (Showing the abstract alongside the pictorial can help children make the connection). Suggested time: 1 lesson without exchanging, 1 lesson with exchanging.	should be taught until children are secure – preferred method for upper KS2.
KEY VOCABULARY	digits subtraction take away less fewer difference minus columnn method place value column exchange regroup decimal decimal point decimal places		

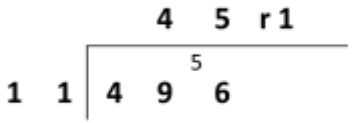
Year 6 - multiplication

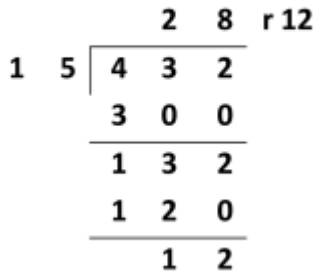
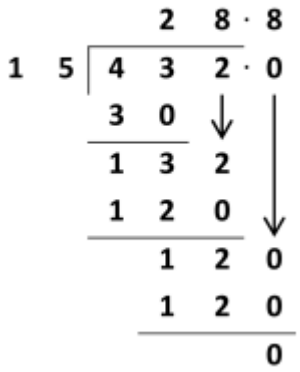
Objective/s	Concrete	Pictorial	Abstract
To multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication	See year 5 for skills recap.		<table><tr><td>×</td><td>200</td><td>30</td><td>4</td></tr><tr><td>30</td><td>6,000</td><td>900</td><td>120</td></tr><tr><td>2</td><td>400</td><td>60</td><td>8</td></tr></table> Use the grid as an abstract representation of the concrete and pictorial. Children should be able to see when an exchange is needed when adding the multiplication answers. Children need to be secure with multiplication fact e.g. knowing how to calculate 20 x 30. (Showing the column method alongside this can help children make the connection). Suggested time: if needed.

		 The grid should progress on to using the column method - the calculations at the side as a link to the grid – once secure they can be left out. Suggested time: 2/3 lessons for three-digits, 2/3 lessons for four-digits. Children should be secure using this method – preferred method for year 6.

Multiply one-digit numbers with up to 2 decimal places by whole numbers			 If secure, children could be shown how to use the column method to multiply (this is non-statutory and should only be taught if children are secure with the concrete and pictorial).
KEY VOCABULARY	digits multiplication multiply times array groups of lots of repeated addition product commutative column method place value column grid decimal place decimal number decimal point integer		

Year 6 - division

Objective/s	Concrete	Pictorial	Abstract
To divide numbers up to 4 digits by a two-digit number using the formal written method of short division. To divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division	See year 5 for skills recap.		496 ÷ 11 becomes  Answer: $45\frac{1}{11}$ Children are re-introduced to the formal written method of short division but this time dividing by a 2-digit number (where appropriate e.g. times tables facts they know or can easily work out). This should begin with calculations that require 0-1 exchanges, moving on to calculations that require more than one. This should include problems that have remainders (some problems may require the remainder to be presented in fraction / decimal form). Suggested time: until secure.

To use written division methods in cases where the answer has up to 2 decimal places		432 ÷ 15 becomes  2 8 r 12 15 | 432 300 132 120 12 432 ÷ 15 becomes  2 8 · 8 15 | 432 · 0 30 ↓ 132 120 ↓ 120 120 0 Children are introduced to the formal written method of long division dividing by a 2-digit number. This should include problems that have remainders (some problems may require the remainder to be presented in fraction form).

		Suggested time: until secure.
KEY VOCABULARY	division divide share share into equal groups remainder/left over groups of/lots of	