

Widney Junior School

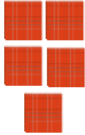


Written calculations policy

Year 3 Addition

Written methods

- Add numbers with up to three digits (HTO + HTO) using formal written methods of columnar addition and subtraction
- Estimate the answer to a calculation and use inverse operations to check answers

H	T	O
+ 		
		
9	3	5



Concrete and pictorial methods for addition

Children will build on concrete and pictorial methods for addition before being introduced to the formal written method of columnar addition. The amount of time that should be spent teaching and practising these methods will depend on how secure the children are in their recall of number facts and in their understanding of place value. Base 10 Diennes equipment can be substituted with 'Place Value counters' once children are completely secure in the value of the digits and the base ten nature of our number system. These should be introduced in the same way as other resources, with careful modelling of using exchange when regrouping.

Continue to integrate the concept of addition and subtraction being the inverse of each other with questions such as; 'If I have 161 in my answer bar at the bottom of the grid, what might my grid have looked like at the start?' 'Can you find an example where I wouldn't need to regroup?'

Formal written method of columnar addition

$$548 + 387$$

$$\begin{array}{r} 548 \\ + 387 \\ \hline 935 \\ \text{1 1} \end{array}$$

The use of concrete materials and pictorial methods leads to the formal written method of columnar addition so that children fully understand the procedure, and the effectiveness and efficiency of the method.

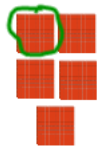
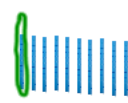
Carry digits are recorded below the line, using the words 'carry ten' or 'carry one hundred', not 'carry one'. Also referred to as regrouping when a column exceeds 9.

Where appropriate, place value columns are labelled, e.g. HTO, to remind children of the value of each of the digits.

Year 3 Subtraction

Written methods

- Subtract numbers with up to three digits (HTO + HTO) using formal written methods of columnar subtraction
- Estimate the answer to a calculation and use inverse operations to check answers

H	T	O
  -	 	 
3	5	6

Concrete and pictorial methods for subtraction

Children will build on concrete and pictorial methods for subtraction before being introduced to the formal written method of columnar subtraction. The amount of time that should be spent teaching and practising these methods will depend on how secure the children are in their recall of number facts and in their understanding of place value. Base 10 Diennes equipment can be substituted with 'Place Value counters' once children are completely secure in the value of the digits and the base ten nature of our number system. These should be introduced in the same way as other resources, with careful modelling of using exchange when regrouping.

Formal written method of columnar subtraction (decomposition)

The use of concrete materials and pictorial methods leads to the formal written method of columnar subtraction so that children fully understand the procedure, and the effectiveness and efficiency of the method. Children should be encouraged to find similarities and differences between both methods. Refer to each part of the calculation and ensure the children make links between the two representations: *How have I shown the one ten exchanged for ten ones in the written method? Why have I changed the 5 to a 4 in the tens column? How did this look with the practical equipment?*

Start by subtracting the least significant digits first, i.e. the ones, then the tens, and finally the hundreds. Refer to subtracting the hundreds, for example, by saying 'five hundred subtract one hundred', not 'five subtract one'.

In this example, the ones to be subtracted are larger than the ones you are subtracting from and the same occurs in the tens column. You exchange one of the 5 hundreds for 10 tens, crossing out 5 and writing a superscript 4. You then need to exchange one of the tens for 10 ones, crossing out the 10 tens and writing a superscript 9. The calculation then becomes 13 subtract 7, 90 subtract 40 and finally 400 subtract 100.

Where appropriate, place value columns are labelled, e.g. HTO, to remind children of the value of each of the digits.

Continue to integrate the concept of addition and subtraction being the inverse of each other with questions such as; 'If I had 126 in my answer bar at the bottom of the grid, and I had subtracted 37 as we have done here, what must my starting number have been? Did I still need to exchange?'

$$503 - 147$$

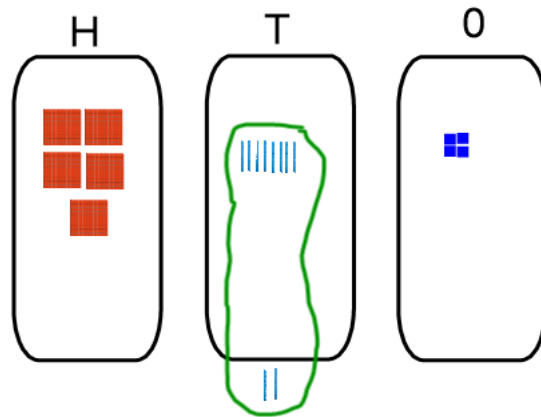
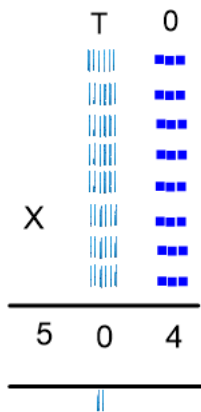
$$\begin{array}{r}
 \overset{4}{5}\overset{9}{0}\overset{1}{3} \\
 - 147 \\
 \hline
 356
 \end{array}$$

Year 3 multiplication

Written methods

- Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for **two-digit** numbers times **one-digit** numbers, using mental and progressing to formal written methods (T0X0)

Concrete and pictorial methods for multiplication



Formal written method of short multiplication

Children will be introduced to the formal written method of short multiplication alongside concrete and pictorial methods for multiplication so that children fully understand the procedure, and the effectiveness of the method. The amount of time that should be spent teaching and practicing with resources will depend on how secure the children are in their understanding of place value.

$$\begin{array}{r} 63 \\ \times 8 \\ \hline 504 \end{array}$$

Children should describe what they do by referring to the actual values of the digits in the columns (e.g. when multiplying the tens in 63×8 it is 'sixty multiplied by eight', not 'six multiplied by eight', although the relationship 6×8

should be stressed).

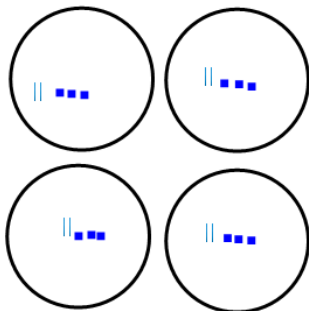
Where appropriate, place value columns are labelled, e.g. HTO, to remind children of the value of each of the digits

Year 3 Division

Written methods

Short division (without a remainder):

- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for **two**-digit numbers times **one**-digit numbers, using mental and progressing to formal written methods ($T0 \div 0$)



$$\begin{array}{r} 23 \\ 4 \overline{)92} \end{array}$$

Concrete and pictorial methods for Division

Children will build on concrete and pictorial methods for division before being introduced to the formal written method of short division.

In this example, you would say I have 9 tens and 2 ones. ($90 + 2$). I am going to share 92 between four groups because that is the number that I am dividing by. How can I share 9 tens equally into 4 groups? How many tens go equally into four groups? (2) Because four goes into 90 20 times. We have a ten left over so I am going to exchange this ten for ten ones. I now have 12 ones. How can I share 12 equally into four groups? (3). How many do I have now in each group?

The amount of time that should be spent teaching and practising with resources depends on how secure the children are in their understanding of place value.

Base 10 Diennes equipment can be substituted with 'Place Value counters' once children are completely secure in the value of the digits.

Formal written method of short division

Children should then be introduced to the formal written methods of short division. Children should describe what they are doing using phrases similar to the following: 'How many fours divide into 90 so that the answer is a multiple of 10? (20) There are 20 fours or 80, with 12 remaining. How many fours in 12? (3) So 92 divided by four is 23.' The superscript 1 represents the 1 ten that is remaining after 4 has been divided into 90. It is written in front of the 2 to show that 12 now has to be divided by 4.

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Year 4 Addition

Written methods

- Add numbers with up to four digits, using the formal written methods of columnar addition (including money and measures (ThHTO + ThHTO))
- Estimate and use inverse operations to check the answer to a calculation

TH	H	T	O
 + 	 	 	 
7	8	3	4

Concrete and pictorial methods for addition

Children will recap and build on concrete and pictorial methods for addition as taught in year 3. The amount of time that should be spent teaching and practising these methods will depend on how secure the children are in their recall of number facts and in their understanding of place value.

Base 10 Diennes equipment can be substituted with 'Place Value counters' once children are completely secure in the value of the digits and the base ten nature of our number system. These should be introduced in the same way as other resources, with careful modelling of using exchange when regrouping.

Formal written method of columnar addition

$$2456 + 5378$$

$$\begin{array}{r}
 2456 \\
 + 5378 \\
 \hline
 7834 \\
 \text{1} \quad \text{1}
 \end{array}$$

$$£1.45 + £2.45$$

$$\begin{array}{r}
 1.46 \\
 + 2.49 \\
 \hline
 3.95
 \end{array}$$

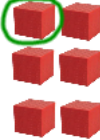
The use of concrete materials and pictorial methods leads to the formal written method of columnar addition so that children fully understand the procedure, and the effectiveness and efficiency of the method.

Carry digits are recorded below the line, using the words 'carry ten', 'carry one hundred', or 'carry one thousand', not 'carry one'. Also referred to as regrouping when a column exceeds 9.

Use other practical resources such as coins (£1, 10p, 1p) and masses (100g, 10g, 1g) when adding in the context of measures (to 2 d.p.) Encourage children to explain their thinking in terms of the practical equipment, continuing to make use of the base board where appropriate.

Year 4 subtraction

- Subtract numbers with up to four digits, using the formal written methods of columnar subtraction (including money and measures (ThHTO + ThHTO))
- Estimate and use inverse operations to check the answer to a calculation

TH	H	T	O
 	 	  	 
3	8	7	2

Formal written method of columnar subtraction (decomposition)

The use of concrete materials and pictorial methods leads to the formal written method of columnar subtraction so that children fully understand the procedure, and the effectiveness and efficiency of the method.

Start by subtracting the least significant digits first, i.e. the ones, then the tens, then the hundreds and finally the thousands. Refer to subtracting the tens, for example, by saying ‘11 tens subtract four tens’, not ‘11 subtract four’.

In this example the tens and the hundreds to be subtracted are larger than both the tens and hundreds you are subtracting from. The calculation begins 8 subtract 6. Then you exchange one of the 4 hundreds for 10 tens, crossing out 4 and writing a superscript 3, and crossing out the 1 and writing a superscript 11. The calculation then becomes 11 tens subtract 4 tens. You then exchange one of the 6 thousands for 10 hundreds, crossing out the 6 and writing a superscript 5, and writing a superscript 1 in front of the 3 to make 13 hundreds. The calculation then becomes 13 hundreds subtract 5 hundreds. Then finally 5000 subtract 2000.

Where appropriate, place value columns are labelled, e.g. ThHTO, to remind children of the value of each of the digits.

£4.45-£2.27

$$\begin{array}{r} 4.45 \\ - 2.27 \\ \hline 2.38 \end{array}$$

6418-2546

$$\begin{array}{r} \overset{5}{\cancel{6}}\overset{13}{\cancel{4}}\overset{1}{1}8 \\ - 2546 \\ \hline 3872 \end{array}$$

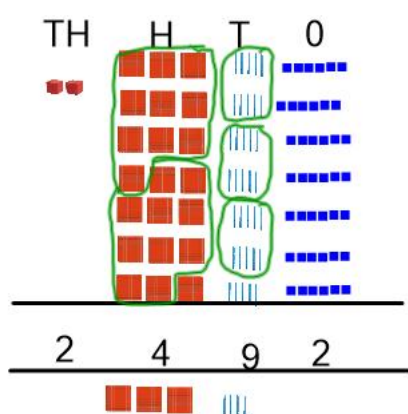
Year 4 Multiplication

Written methods

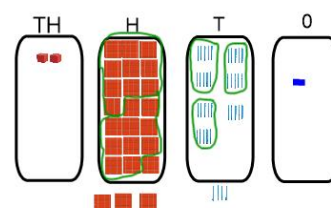
Short multiplication:

- Multiply a two-digit or three-digit number by a one-digit number using formal written layout (TO $\times$ O/HTO $\times$ O)

Formal written method of short multiplication



$$\begin{array}{r} 356 \\ \times 7 \\ \hline 2492 \end{array}$$



Children will be introduced to the formal written method of short multiplication alongside concrete and pictorial methods for multiplication so that children fully understand the procedure, and the effectiveness of the method. The amount of time that should be spent teaching and practising with resources will depend on how secure the children are in their understanding of place value.

Children should describe what they do by referring to the actual values of the digits in the columns (e.g. when multiplying the tens in 356×7 it is 'fifty multiplied by seven', not 'five multiplied by seven', although the relationship 5×7 should be stressed).

Where appropriate, place value columns are labelled, e.g. THTO, to remind children of the value of each of the digits.

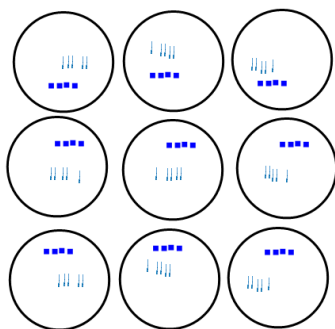
Year 4 Division

Written methods

Concrete and pictorial methods for Division

Short division (without a remainder):

- Divide a two-digit or three-digit number by a one-digit number ($TO \div O$ / $HTO \div O$)
- Estimate and check the answer to a calculation



In this example, you would say I have 4 hundreds, 8 tens and 6 ones. ($400 + 80 + 6$). I am going to share 486 between nine groups because that is the number that I am dividing by. Can I share 4 hundreds equally into 9 groups? No. So I am going to exchange my 4 hundreds into forty tens. I now have 48 tens. How can I share them into 9 equal groups (5 times because 50 nines go into 450. I have 3 tens left over so I am going to exchange them into 30 ones. I now have 36 ones. How can I share these into 9 equal groups? (4) How many do I have now in each group?

The amount of time that should be spent teaching and practising with resources depends on how secure the children are in their understanding of place value.

Base 10 Diennes equipment can be substituted with 'Place Value counters' once children are completely secure in the value of the digits.

$$\begin{array}{r} 54 \\ 9 \overline{) 486} \\ \underline{45} \\ 36 \\ \underline{36} \\ 0 \end{array}$$

Formal
written
method of short division

Children should describe what they are doing using phrases similar to the following: 'How many nines divide into 480 so that the answer is a multiple of 10? (50) There are 50 nines or 450, with 36 remaining. How many nines in 36? (4) So 486 divided by nine is 54.'

The superscript 3 represents the 3 tens that are remaining after 9 has been divided into 480. It is written in front of the 6 to show that 36 now has to be divided by 9.

Year 5 Addition

Written methods

- Add whole numbers with more than four digits, using columnar addition.
- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

$$12,957 + 14,635$$

$$\begin{array}{r} 12957 \\ + 14635 \\ \hline 27592 \\ \text{1} \quad \text{1} \end{array}$$

Formal written method of columnar addition

Carry digits are recorded below the line, using the words 'carry ten', 'carry one hundred', 'carry one thousand' or 'carry ten thousand', not 'carry one'. Also referred to as regrouping when a column exceeds 9.

Where appropriate, place value columns are labelled, e.g. T^o-th, to remind children of the value of each of the digits.

Any children working below the standard for that year group will build on the use of concrete apparatus and pictorial methods as seen in years 3 and 4

$$56.47 + 84.84$$

$$\begin{array}{r} 56.47 \\ + 84.84 \\ \hline 141.31 \\ \text{1} \quad \text{1} \quad \text{1} \end{array}$$

Year 5 Subtraction

Written methods

- Subtract whole numbers with more than four digits, using columnar addition.
- Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
- Solve subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

$$45,257 - 17,488$$

$$\begin{array}{r} \overset{3}{4} \overset{14}{5} \overset{11}{2} \overset{14}{5} \overset{1}{7} \\ - 17488 \\ \hline 27769 \end{array}$$

$$83.72 - 36.49$$

$$\begin{array}{r} \overset{7}{8} \overset{1}{3} \overset{8}{.} \overset{1}{7} \overset{2}{2} \\ - 36.29 \\ \hline 47.43 \end{array}$$

Formal written method of columnar subtraction

Start by subtracting the least significant digits first, i.e. in the first example, the ones, then the tens, then the hundreds then the thousands and finally the tens of thousands. Refer to subtracting the tens, for example, by saying '14 tens subtract 8 tens', not '14 subtract 8'.

In the first example the ones, tens, hundreds and thousands to be subtracted are all larger than all of the ones, tens, hundreds and thousands you are subtracting from.

The calculation begins by exchanging one of the 5 tens for 10 ones, crossing out the 5 and writing a superscript 4, and crossing out the 7 and writing a superscript 17. The calculation then becomes 17 subtract 8.

You then exchange one of the 2 hundreds for 10 tens, crossing out the 2 and writing a superscript 1, and writing a superscript 1 in front of the 4 to make 14 tens. The calculation then becomes 14 tens subtract 8 tens.

Next, you exchange one of the 5 thousands for 10 hundreds, crossing out the 5 and writing a superscript 4, and writing a

superscript 1 in front of the 1 to make 11 hundreds. The calculation then becomes 11 hundreds subtract 4 hundreds.

Then you exchange one of the 4 tens of thousands for 10 thousands, crossing out the 4 and writing a superscript 3, and writing a superscript 1 in front of the 4 to make 14 thousands. The calculation then becomes 14 thousands subtract 7 thousands.

Then finally 30 000 subtract 10 000.

Where appropriate, place value columns are labelled, e.g. TO-th, to remind children of the value of each of the digits.

Children should continue to use the place value counters, in columns, to support their conceptual understanding of subtraction

Teachers should ensure they include examples in context as well as those requiring the subtraction of several numbers and different numbers of decimal places.

Any children working below the standard for that year group will build on the use of concrete apparatus and pictorial methods as seen in years 3 and 4

Year 5 Multiplication

Written methods

- Multiply numbers up to four digits by a one- or 2-digit number using a formal written method, including long multiplication for two digit numbers. (HTO $\times$ O/ThHTO $\times$ O) (TO $\times$ TO/HTO $\times$ TO)
- Solve problems involving multiplication and division.

$$\begin{array}{r} 378 \\ \times 4 \\ \hline 1512 \\ \hline \end{array}$$

3 3

Short multiplication:

Formal written method of short multiplication

Consolidation of short multiplication should continue with increasingly large numbers, using the same method as that taught previously in year 4.

Children should describe what they do by referring to the actual values of the digits in the columns (e.g. when multiplying the tens in 378×4 it is 'seventy multiplied by four', not 'seven multiplied by four', although the relationship 7×4 should be stressed).

Where appropriate, place value columns are labelled, e.g. ThHTO, to remind children of the value of each of the digits.

Any children working below the standard for that year group will build on the use of concrete apparatus and pictorial methods as seen in years 3 and 4

Long multiplication:

Extend to long multiplication for 3-digit by a 2-digit number, maintaining the importance of verbalising the value of the digits involved.

In this calculation, the children will solve 8×6 , 40×6 , 300×6 (carrying/regrouping the numbers accordingly). They will then put a zero down to show the place holder of 4 as 40 (ten times bigger). Then they will solve 8×40 , 40×40 , 300×40 Finally add the two products together.

Where appropriate, place value columns are labelled, e.g. HTO, to remind children of the value of each of the digits.

$$\begin{array}{r} 348 \\ \times 46 \\ \hline 2088 \\ 13920 \\ \hline 16008 \end{array}$$

Year 5 Division

Written methods

- Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for context. (HTO $\div$ O/ThHTO $\div$ O)
- Solve problems involving multiplication and division.

Formal written method of short division

Whole number remainder

$$\begin{array}{r} 46\text{r}3 \\ 6 \overline{) 279} \end{array}$$

Decimal remainder

$$\begin{array}{r} 46.5 \\ 6 \overline{) 279.0} \end{array}$$

Following on from Year 4, children should be given the opportunity to consolidate their understanding of the formal written method for division, expressing remainders as whole numbers. Ensure examples are given in context, where children are required to decide whether the remainder should be left, or the answer rounded up or down.

Children should describe what they are doing using phrases similar to the following: 'How many sixes divide into 270 so that the answer is a multiple of 10? (40) There are 40 sixes or 240, with 30 remaining.' The superscript 3 represents the 3 tens that are remaining after 6 has been divided into 270. It is written in front of the 9 to show that 39 now has to be divided by 6.

Children then ask: 'How many sixes in 39?' (6 remainder 3). Depending on the context, the remainder is written as a whole number, fraction, decimal or rounded up or down.

Any children working below the standard for that year group will build on the use of concrete apparatus and pictorial methods as seen in years 3 and 4

Fraction remainder

$$\begin{array}{r} 46\frac{1}{2} \\ 6 \overline{) 279} \end{array}$$

Year 6 Addition

Written methods

- solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why (numbers more than 4 digits, including decimals up to 3 places)
- use their knowledge of the order of operations to carry out calculations involving the four operations
- use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

Formal written method of columnar addition

$$456,287 + 359,849$$

$$\begin{array}{r} 456287 \\ + 359849 \\ \hline 816136 \\ \text{1 1 1 1 1} \end{array}$$

$$57.486 + 45.378$$

$$\begin{array}{r} 57.486 \\ + 45.378 \\ \hline 102.864 \\ \text{1 1 1} \end{array}$$

Carry digits are recorded below the line, using the words 'carry ten', 'carry one hundred', 'carry one thousand', ... not 'carry one'. Also referred to as regrouping when a column exceeds 9.

Where appropriate, place value columns are labelled, e.g. Tth, to remind children of the value of each of the digits.

Any children working below the standard for that year group will build on the use of concrete apparatus and pictorial methods as seen in years 3 and 4

Year 6 Subtraction

- Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why (numbers more than 4 digits, including decimals up to 3 [places])
- use their knowledge of the order of operations to carry out calculations involving the four operations

Written methods

$$746,291 - 298,354$$

$$\begin{array}{r} \overset{6}{7} \overset{13}{4} \overset{15}{6} \overset{1}{2} \overset{8}{9} \overset{1}{1} \\ - 298\,354 \\ \hline 447\,937 \end{array}$$

$$63.237 - 45.869$$

$$\begin{array}{r} \overset{2}{6} \overset{11}{3} \overset{12}{2} \overset{1}{3} \overset{1}{7} \\ - 45.869 \\ \hline 23.368 \end{array}$$

Formal written method of columnar subtraction (decomposition)

Start by subtracting the least significant digits first, i.e. in the first example, the ones, then the tens ... and finally the hundreds of thousands. Refer to subtracting the tens, for example, by saying '8 tens subtract 5 tens', not '8 subtract 5'.

In the first example, the ones, tens, thousands and tens of thousands to be subtracted are all larger than all of the ones, tens, thousands and tens of thousands you are subtracting from.

The calculation begins by exchanging one of the 9 tens for 10 ones, crossing out the 9 and writing a superscript 8, and writing a superscript 11. The calculation then becomes 11 subtract 4.

You then calculate 8 tens subtract 5 tens.

Next, you exchange one of the 6 thousands for 10 hundreds, crossing out the 6 and writing a superscript 5, and crossing out the 2 and writing a superscript 12. The calculation then becomes 12 hundreds subtract 3 hundreds.

Then you exchange one of the 4 tens of thousands for 10 thousands, crossing out the 4 and writing a superscript 3, and writing a superscript 1 in front of the 5 to make 15 thousands. The calculation then becomes 15 thousands subtract 8 thousands.

Next, you exchange one of the 7 hundreds of thousands for 10 tens of thousands, crossing out the 7 and writing a superscript 6, and writing a superscript 1 in front of the 3 to make 13 tens of thousands. The calculation then becomes 13 tens of thousands subtract 9 tens of thousands.

Then, finally, 600 000 subtract 200 000.

Where appropriate, place value columns are labelled, e.g. Tth, to remind children of the value of each of the digits.

Any children working below the standard for that year group will build on the use of concrete apparatus and pictorial methods as seen in years 3 and 4

Year 6 Multiplication

Written methods

- Multiply multi-digit numbers up to 4 digits by a one-digit whole number
Multiply one-digit or two-digit numbers with up to two decimal places by a one-digit number

$$\begin{array}{r} 5643 \\ \times \quad 8 \\ \hline 45144 \\ \text{5 3 2} \end{array}$$

Formal written method of short multiplication

Children should describe what they do by referring to the actual values of the digits in the columns (e.g. when multiplying the tens in 5643×8 it is 'forty multiplied by eight', not 'four multiplied by eight', although the relationship 4×8 should be stressed).

Where appropriate, place value columns are labelled, e.g. TTHTHTO, to remind children of the value of each of the digits.

Formal written method of short multiplication (with decimals)

$$\begin{array}{r} 4.83 \\ \times \quad 6 \\ \hline 28.98 \\ \text{4 1} \end{array}$$

Children will treat this calculation as a whole number (but keeping the decimal point in) $.483 \times 6$ is 'eighty multiplied by six, not 'eight multiplied by six', although for both methods the relationship 8×6 should be stressed. Where appropriate, place value columns are labelled, e.g. HTO, to remind children of the value of each of the digits.

When children arrive at an answer they then need to adjust the answer accordingly.

4.83×6 is equivalent to $483 \times 6 \div 100$

$$2898 \div 100 = 28.98$$

Year 6 Multiplication

Written methods continued

- Multiply multi-digit numbers up to four digits by a two-digit number (TO $\times$ TO / HTO $\times$ TO)

Formal written method of long multiplication

285 is multiplied by 60 (using knowledge of 285×6), then 285 is multiplied by 3, and finally the two products are added together.

$$\begin{array}{r} 285 \\ \times 63 \\ \hline 855 \\ 2 1 \\ 17100 \\ 5 3 \\ \hline 17955 \end{array}$$

Children should describe what they do by referring to the actual values of the digits in the columns (e.g. when multiplying the tens in 285×63 it is 'eighty multiplied by sixty', not 'eight multiplied by six', although the relationship 8×6 should be stressed).

In this calculation, the children will solve 5×3 , 80×3 , 200×3 (carrying/regrouping the numbers accordingly). They will then put a zero down to show the place holder of 6 as 60 (ten times bigger). Then they will solve 5×60 , 80×60 , 200×60 Finally add the two products together.

Where appropriate, place value columns are labelled, e.g. HTO, to remind children of the value of each of the digits

Year 6 Multiplication

Written methods continued

- Multiply one-digit numbers with up to two decimal places by a two-digit number

Long multiplication (Decimals):

Formal written method of long multiplication

$$\begin{array}{r} 7.56 \\ \times \quad 34 \\ \hline 3024 \\ 22680 \\ \hline 257.04 \end{array}$$

Children will treat this calculation as a whole number (but keeping the decimal point in)

The first step is to show all of the calculations involved, e.g. 756 is multiplied by 4, then by 30 (using knowledge of 756×3), finally the two products are added together.

In this calculation, the children will solve 6×4 , 50×4 , and 700×4 (carrying/regrouping the numbers accordingly). They will then put a zero down to show the place holder of 3 as 30 (ten times bigger). Then they will solve 6×30 , 50×30 , 500×30 Finally add the two products together.

Where appropriate, place value columns are labelled, e.g. HTO, to remind children of the value of each of the digits.

When children arrive at an answer they then need to adjust the answer accordingly.

7.56×34 is equivalent to $756 \times 34 \div 100$

$25704 \div 100 = 257.04$

Year 6 Division

Written methods

- Divide numbers up to 4 digits by a one-digit number using the formal written method of short division, interpreting remainders according to the context. (HTO $\div$ O/ThHTO $\div$ O)

Formal written method of short division

Whole number remainder

$$\begin{array}{r} 229 \text{ r } 6 \\ 8 \overline{) 1838} \end{array}$$

Fraction remainder

$$\begin{array}{r} 229 \frac{3}{4} \\ 8 \overline{) 1838} \end{array}$$

Decimal remainder

$$\begin{array}{r} 229.75 \\ 8 \overline{) 1838.00} \end{array}$$

Following on from Year 5, children will now be confident using a compact layout for short division of a four-digit number by a single digit number. Children should describe what they are doing using phrases similar to the following: 'How many eights divide into 1800 so that the answer is a multiple of 100?' (200) There are 200 eights or 1600, with 200 remaining. The superscript 2 represents the 2 hundreds that are remaining after 8 has been divided into 1800. It is written in front of the 3 to show that a total of 23 tens (230) now have to be divided by eight.

Children then ask: 'How many eights divide into 230 so that the answer is a multiple of 10?' (20) There are 20 eights or 160, with 70 remaining. The superscript 7 represents the 7 tens that are remaining after 8 has been divided into 230. It is written in front of the 8 to show that 78 now has to be divided by 8. Children then ask: 'How many eights in 78?' (9 remainder 6). Depending on the context, the remainder is written as a whole number, fraction, decimal or rounded up or down.

Any children working below the standard for that year group will build on the use of concrete apparatus and pictorial methods as seen in years 3 and 4

$$\begin{array}{r} 7.56 \\ 6 \overline{) 45.36} \end{array}$$

Method 1: Calculating with decimals

Phrases similar to those above for short division of whole numbers should be used for short division involving decimals.

An emphasis should be placed on recognising the value of each of the digits in the dividend.

- Divide numbers up to 4 digits by a two-digit number using the formal written method of long division, interpreting remainders according to the context. (HTO $\div$ O/ThHTO $\div$ O)

Formal written method of long division

$$\begin{array}{r} 324 \text{ r } 4 \\ 18 \overline{) 5836} \\ \underline{- 54} \downarrow \\ 43 \downarrow \\ \underline{- 36} \downarrow \\ 76 \\ \underline{- 72} \\ 4 \end{array}$$

$$5836 \div 18 = 324 \text{ r } 4 \text{ or } 324\frac{2}{9}$$

Long division (Decimals)

Formal written method of long division

$58.32 \div 18$ is equivalent to $5832 \div 18 \div 100$

$$\begin{array}{r} 324 \\ 18 \overline{) 58.32} \\ \underline{- 54} \\ 43 \\ \underline{- 36} \\ 72 \\ \underline{- 72} \\ 0 \end{array}$$

$$324 \div 100 = 3.24$$

Converting decimals to whole numbers before calculating, then converting the answer back to decimals.

$58.32 \div 18$ is equivalent to
 $5832 \div 18 \div 100$