Park Hall Junior Academy's Mathematics Calculation Policy

Parents' guide Year 6

/

Contents

The purpose of this guide is to outline the various calculation methods for addition, subtraction, multiplication and division that children are taught as they progress through the school, many of which look different to the methods that you may have been taught in your primary school days. This guide will also explain to you how we teach each method therefore creating a level of consistency between home and school. Hopefully, this consistency will prevent confusion of the teaching of too many methods and will support your child's progression in Mathematics. The methods below are mainly used for written calculations (calculations that are too difficult to complete mentally). Your child will also be taught a range of mental strategies to consolidate their understanding of number facts and begin to develop ways of recording to support their thinking and calculation methods. As children progress through the school and are taught more formal written methods, they are still encouraged to think about mental strategies they could use first and only use written methods for those calculations they cannot solve in their heads.

When faced with a calculation problem, encourage your child to ask:

Can I do this in my head?

Could I do this in my head using drawings or jottings to help me?

Do I need to use a written method?

Should I use a calculator?

Also help your child to estimate and then check the answer. Encourage them to ask:

Is the answer sensible?

We hope the explanations and examples of strategies will help you to assist your child at home.

Addition

Compact column method with crossing the boundaries – larger numbers.

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

Children write the addition they are solving before they present it in a column.

Children write the answer at the end next to the calculation they have written out.

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

Miss a line!

The addition sign positioned on the left side on the bottom line of the addition.

Children add the 1s and find the answer '18'. They partition the answer into 10s and 1s (10 and 8).

They put the 1s number under the line in the 1s column and **carry** the 10s into the 10s column placing it on the line they missed out. Remind children that they are just putting '1' and not '10' as '1' is '1 lot of 10' which is the same as '10'.

Then they add the 10s column and find the answer '22 10s' or '220' (remind children that this is the 10s column). They partition the answer into 100s and 10s (200 and 20). They put the 10s number under the line in the 10s column – remind children that they have '1 lot of 10' so they just write '1' and not '10'.

Then **carry** the 100s into the 100s column placing it on the line they missed out – again remind children that this is '2 lots of 100' so we just put a '2' not '200'.

Then they add the 100s column and find the answer '11 100's or '1100' (remind children that this is the 100s column).

They partition the answer into 1000s and 100s (1000 and 100). They put the 100s number under the line in the 100s column – remind children they have '1 lot of 100' so they write '1' and not '100'.

Then **carry** the 1000s into the 1000s column placing it on the line they missed out – again remind children that this is '1 lot of 1000' so we put '1' and not '1000'.

Then add the 1000s.

Compact column method. Adding several large numbers and decimal numbers with up to 2 decimal places including money.

1	4	.	6	4	+	£	2	8	.	7	8	+	£	1	2	.	2	6	=
														£	5	5	.	6	8
						£	1	4	.	6	4								
						£	2	8	.	7	8								
					+	£	1	2	.	2	6								
						£	1	1	.	1									
						£	5	5	.	6	8								

Children write the addition they are solving before they present it in a column.

The decimal point is to have a box of its own.

Children write the answer at the end next to the calculation they have written out.

Children are to write the pound sign at the beginning of each row.

Miss a line!

The addition sign positioned on the left side on the bottom line of the addition.

Children add the $\frac{1}{100}$s and find the answer 0.18. They partition the answer into $\frac{1}{100}$s and $\frac{1}{10}$s '0.08' and '0.1'.

They put the $\frac{1}{100}$s number under the line in the $\frac{1}{100}$s column and **carry** the $\frac{1}{10}$s into the $\frac{1}{10}$s column placing it on the line they missed out.

Then they add the $\frac{1}{10}$s column and recognise that the answer is 1.6 They partition the answer into $\frac{1}{10}$s and 1s '0.6' and '1'). They put the $\frac{1}{10}$s number under the line in the $\frac{1}{10}$s column.

Then **carry** the 1s into the 1s column placing it on the line they missed out.

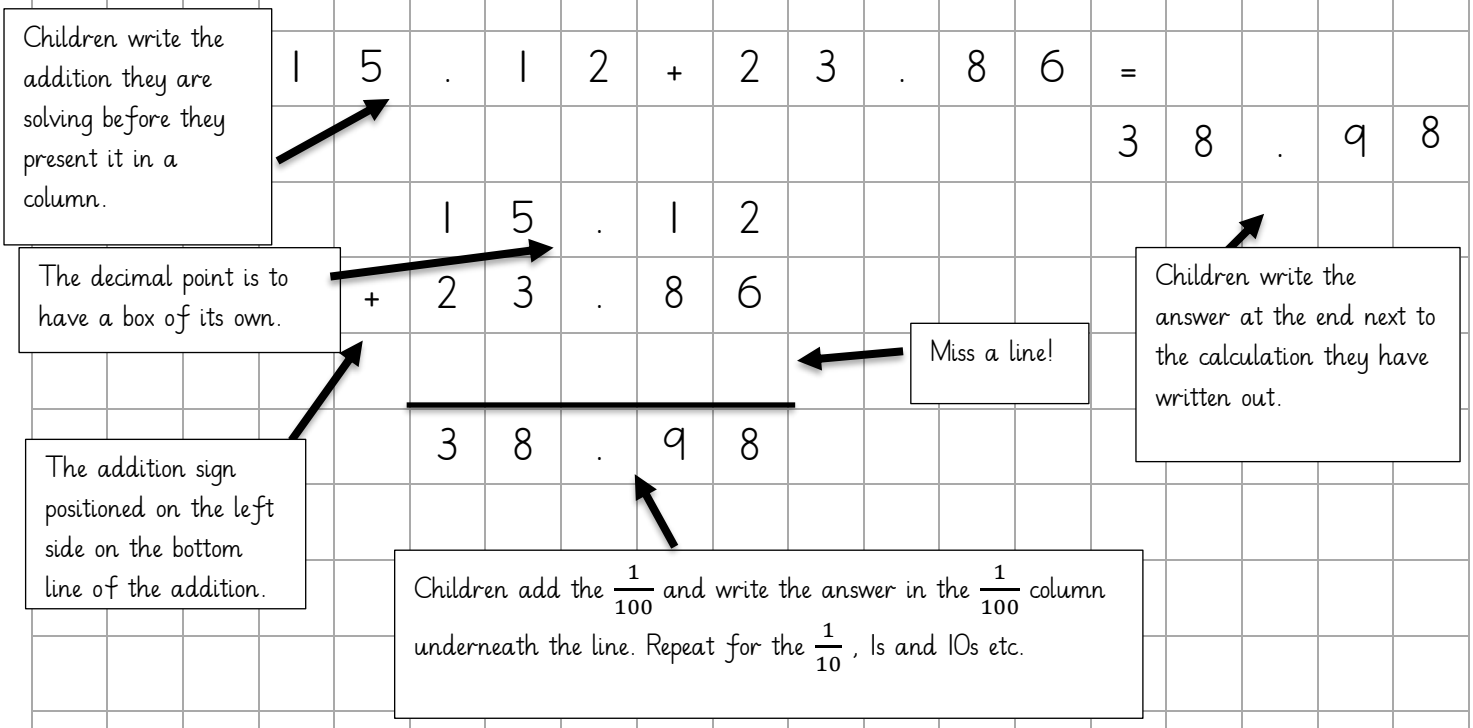
Add the 1s column and find the answer '15'.

They partition the answer into 1s and 10s '5' and '10'. They put the 1s number under the line in the 1s column –.

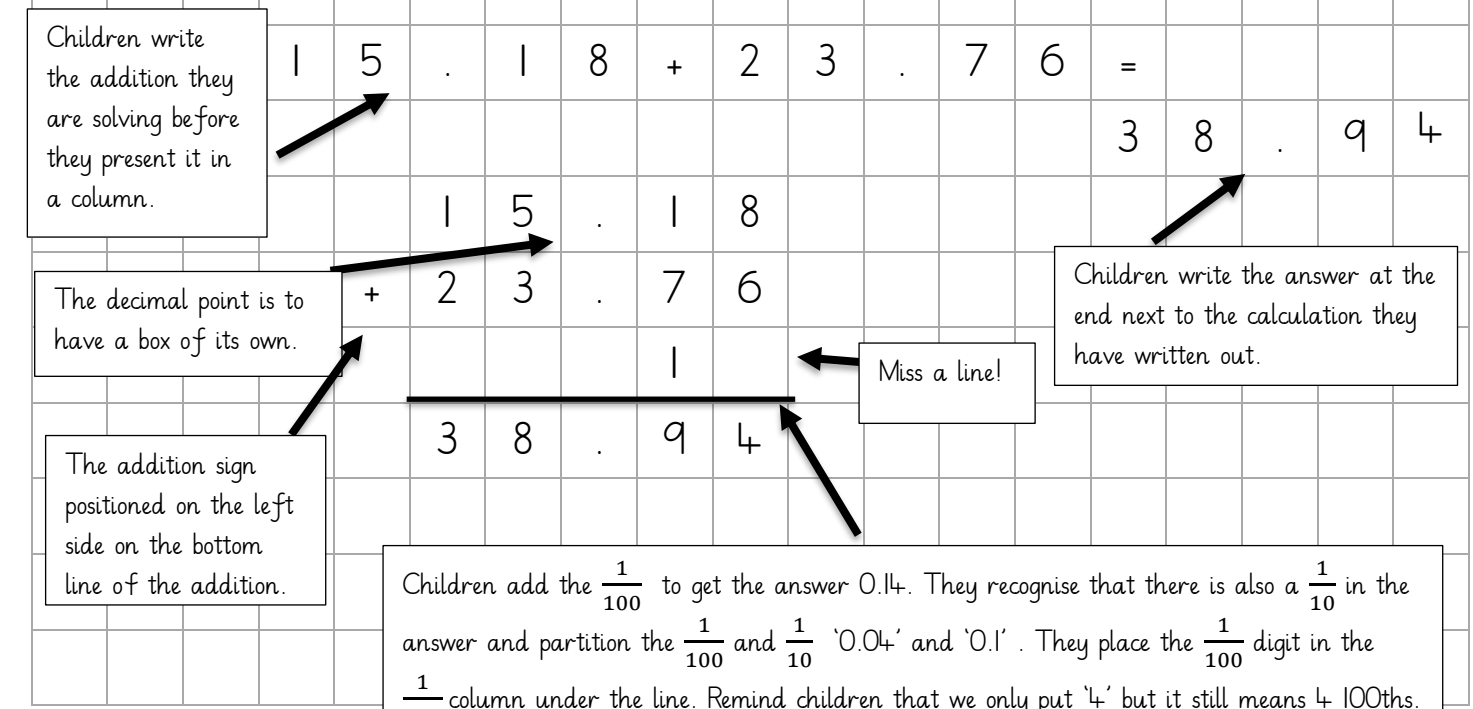
Then **carry** the 10s into the 10s column placing it on the line they missed out.

Then add the 10s.

Compact column method. Adding decimal numbers with up to 2 decimal places without crossing boundaries.



Compact column method. Adding decimal numbers with up to 2 decimal places crossing the $\frac{1}{10}$ boundary.



Compact column method. Adding decimal numbers with up to 2 decimal places.

Crossing the 1s boundary.

Children write the addition they are solving before they present it in a column.

1	5	.	4	2	+	2	3	.	8	6	=				
											3	9	.	2	8
		1	5	.	4	2									
	+	2	3	.	8	6									
			1												
		3	9	.	2	8									

The decimal point is to have a box of its own.

The addition sign positioned on the left side on the bottom line of the addition.

Miss a line!

Children write the answer at the end next to the calculation they have written out.

Children add the $\frac{1}{100}$ and put the answer in the $\frac{1}{100}$ column under the line. They then add the $\frac{1}{10}$ and find the answer 1.2 which includes a 1s number. They partition the number into '1' and '0.2' and put the $\frac{1}{10}$ digit '2' in the correct column under the line. Remind children that we only put 2 but it still means 2 10ths.

They put the 1s digit in the 1s column placing it on the line they missed out.

Compact column method. Adding decimal numbers with up to 2 decimal places.

Crossing the 10s boundary.

Children write the addition they are solving before they present it in a column.

1	8	.	1	2	+	2	3	.	8	6	=				
											4	1	.	9	8
		1	8	.	1	2									
	+	2	3	.	8	6									
		1													
		4	1	.	9	8									

The decimal point is to have a box of its own.

The addition sign positioned on the left side on the bottom line of the addition.

Miss a line!

Children write the answer at the end next to the calculation they have written out.

Children add the $\frac{1}{100}$ and put the answer in the $\frac{1}{100}$ column under the line and repeat for the $\frac{1}{10}$s.

Add the 1s to find the answer '11' They recognise that their answer also includes a 10s number and partition it into 10s and 1s '10' and '1'. They put the 1s digit in the correct column under the line.

They put the 10s digit in the 10s column placing it on the line they missed out. Remind children that we are only putting '1' as it is '1 lot of 10' which is the same as 10.

Adding unlike fractions including mixed numbers.

Children need to recognise that they need to change the denominator so that they are the same.

Remind children whatever happens to the denominator happens to the numerator.

They write what they are multiplying them by in the space that was left.

Leave a space between the fraction and the addition.

$$2\frac{1}{4} \quad \begin{matrix}\times 3\\ \times 3\end{matrix} \quad + \quad 1\frac{1}{3} \quad \begin{matrix}\times 4\\ \times 4\end{matrix} \quad = \quad 3\frac{7}{12}$$

Children then re-write the addition with the new fraction. Miss a line between the two calculations.

$$2\frac{3}{12} \quad + \quad 1\frac{4}{12} \quad = \quad 3\frac{7}{12}$$

Children are to place the numbers in the correct place value columns.

Children are to then add the whole numbers.

$$2 \quad + \quad 1 \quad = \quad 3$$

Children are to then add the answer for the whole number and the fraction together.

$$3 \quad + \quad \frac{7}{12} \quad = \quad 3\frac{7}{12}$$

Subtraction

Counting up on a number line. Finding change from £1

Write out the question. One digit per square.

At the end, children write the answer next to the calculation they have written out.

Children are to leave two lines between the question and the number line.

The first jump only needs to be two squares. The next jump can go to the end.

The jumps should use the two lines that were left so they can write in the jumps.

£ 1 - 3 2 p = 6 8 p

+ 8p + 60p

40p

Children do not need to use one digit per square here.

Children are to write the number they are counting from at the beginning of the number line.

3 2 p £ 1

The first 'jump' always moves to the nearest multiple of 10.

The next 'jump' moves to the £1.

1 0 0 p

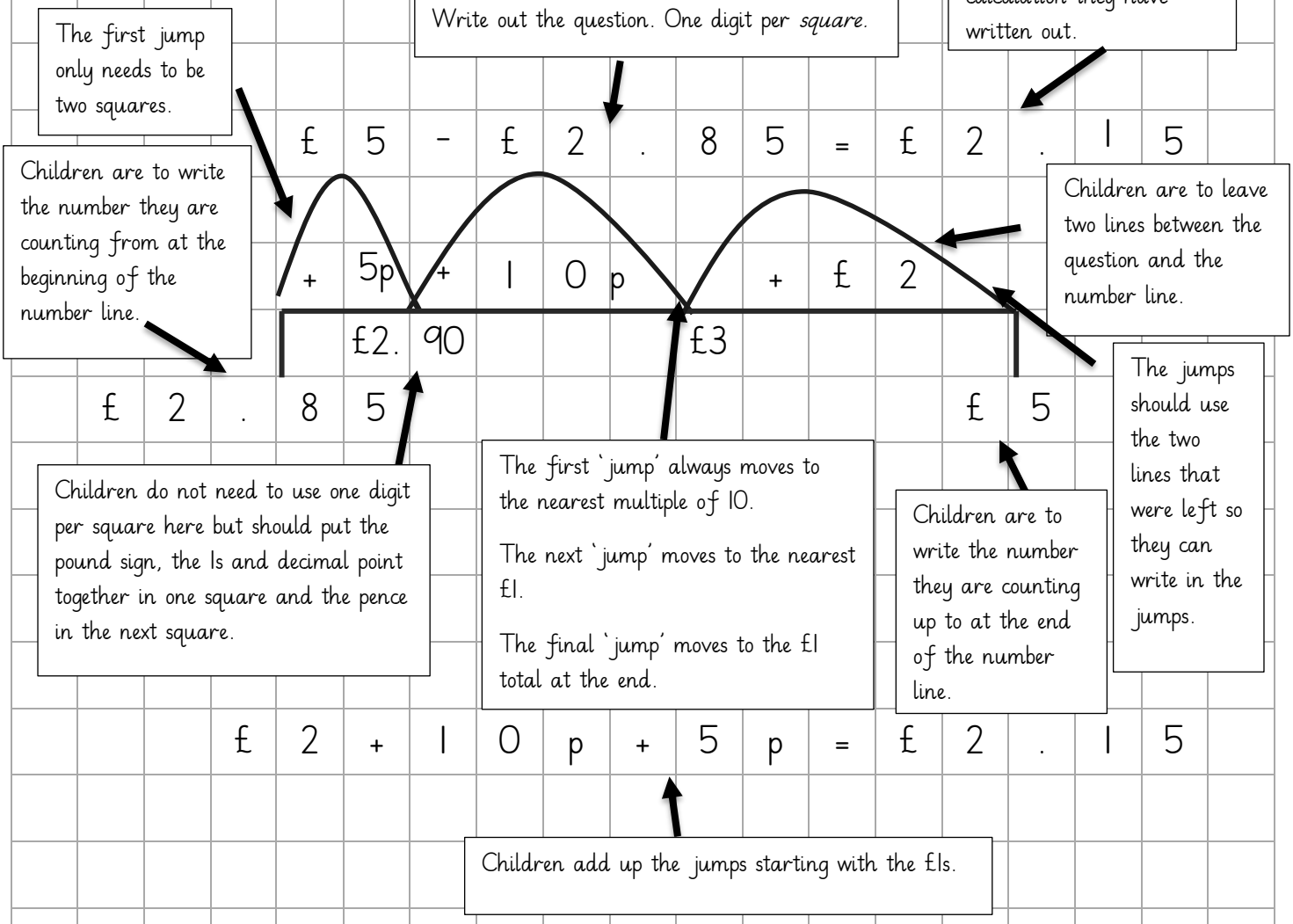
Children are to write the number they are counting up to at the end of the number line.

They may also want to write 100p underneath £1 to remind them that they are counting up to 100 and not 1. (Place value of money misconception - remind children £1 = 100p).

6 0 p + 8 p = 6 8 p

Children add up the jumps starting with the 10s.

Counting up on a number line. Finding change from £5



The first jump only needs to be two squares.

Write out the question. One digit per *square*.

At the end, children write the answer next to the calculation they have written out.

Children are to write the number they are counting from at the beginning of the number line.

Children are to leave two lines between the question and the number line.

The jumps should use the two lines that were left so they can write in the jumps.

Children do not need to use one digit per square here but should put the pound sign, the Is and decimal point together in one square and the pence in the next square.

The first 'jump' always moves to the nearest multiple of 10.

The next 'jump' moves to the nearest £1.

The final 'jump' moves to the £1 total at the end.

Children are to write the number they are counting up to at the end of the number line.

Children add up the jumps starting with the £1s.

NB Finding change for £10 is similar apart from the end number.

Along with finding change from £20 as long as the amount being taken away is over £10.

Similar to finding change from £50 as long as the amount being taken away is over £40.

Also when finding change from £100 as long as the amount being taken away is over £90.

Counting up on a number line. Finding change from £20.

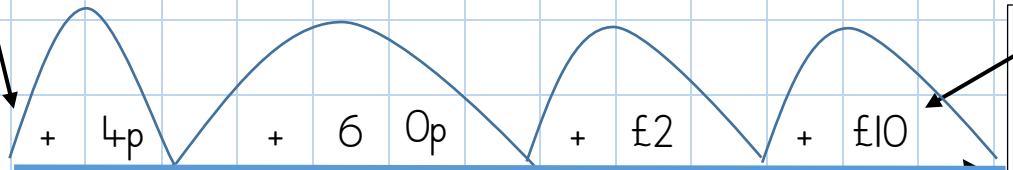
The first jump only needs to be two squares.

Write out the question. One digit per square.

At the end, children write the answer next to the calculation they have written out.

Children are to write the number they are counting from at the beginning of the number line.

£ 2 0 - £ 7 . 3 6 = £ 1 2 . 6 4



Children are to leave two lines between the question and the number line.

£7.40 £8 £10

£ 7 . 3 6 £ 2 0

The jumps should use the two lines that were left so they can write in the jumps.

Children do not need to use one digit per square here but should put the pound sign, the Is and decimal point together in one square and the pence in the next square.

The number the children have 'jumped to' should go at the end of the jump.

The first 'jump' always moves to the nearest multiple of 10.

The next 'jump' moves to the nearest £1.

The next 'jump' moves to £10

The final 'jump' moves to £20

Children are to write the number they are counting up to at the end of the number line.

£ 1 0 + £ 2 + 6 0 p + 4 p =

£ 1 2 . 6 4

Children add up the jumps starting with the £10s.

NB See finding change from £5 for any amount being taken away that is over £10.

//

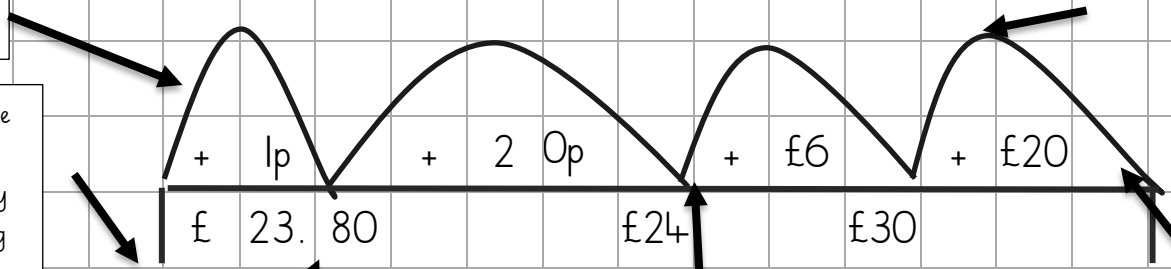
Counting up on a number line. Finding change from £50.

Write out the question. One digit per square.

At the end, children write the answer next to the calculation they have written out.

The first jump only needs to be two squares.

£50 - £23.79 = £26.21



Children are to write the number they are counting from at the beginning of the number line.

£23.80 £24 £30

£23.79 £50

Children do not need to use one digit per square here but should put the pound sign in one square, the 1s and 10s and decimal point together in one square and the pence in the next square.

The first 'jump' always moves to the nearest multiple of 10.

The next 'jump' moves to the nearest £1.

The next 'jump' moves to £10

The final 'jump' moves to £50

The jumps should use the two lines that were left so they can write in the jumps.

Children are to write the number they are counting up to at the end of the number line.

£20 + £6 + 20p + 1p = £26.21

Children add up the jumps starting with the £10s.

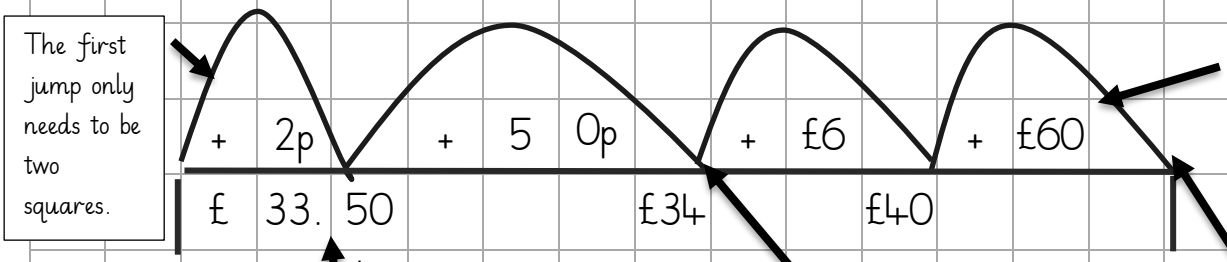
NB See finding change from £5 for any amount being taken away that is over £40.

Counting up on a number line. Finding change from £100

Write out the question. One digit per square.

At the end, children write the answer next to the calculation they have written out.

£100 - £33.48 = £66.52



The first jump only needs to be two squares.

Children are to leave two lines between the question and the number line.

£33.48 £100

Children are to write the number they are counting from at the beginning of the number line.

Children do not need to use one digit per square here but should put the pound sign in one square, the 1s and 10s and decimal point together in one square and the pence in the next square.

The first 'jump' always moves to the nearest multiple of 10.

The next 'jump' moves to the nearest £1.

The next 'jump' moves to £10

The final 'jump' moves to £100

The jumps should use the two lines that were left so they can write in the jumps.

Children are to write the number they are counting up to at the end of the number line.

£60 + £6 + 50p + 2p = £66.52

Children add up the jumps starting with the £10s.

NB See finding change from £5 for any amount being taken away that is over £90.

Counting up on a number line dealing with money.

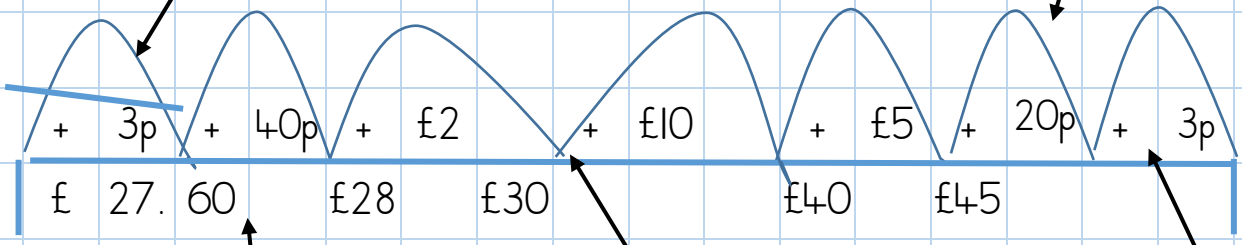
When adding the jumps children may want to cross them off as they may become confused.

Write out the question. One digit per square.

Children are to leave two lines between the question and the number line.

At the end, children write the answer next to the calculation they have written out.

£ 4 5 . 2 3 - £ 2 7 . 5 7 = 1 7 . 6 6



£ 2 7 . 5 7 £ 4 5 . 2 3

Children are to write the number they are counting from at the beginning of the number line.

Children do not need to use one digit per square here but should put the pound sign in one square, the 1s and 10s and decimal point together in one square and the pence in the next square.

The first 'jump' always moves to the nearest multiple of 10.

The next 'jump' moves to the nearest £1.

The next 'jump' moves to £10

Children are to write the number they are counting up to at the end of the number line.

Children at the end may want to add 23p but they need to split this up as it will become confusing when they come to add them.

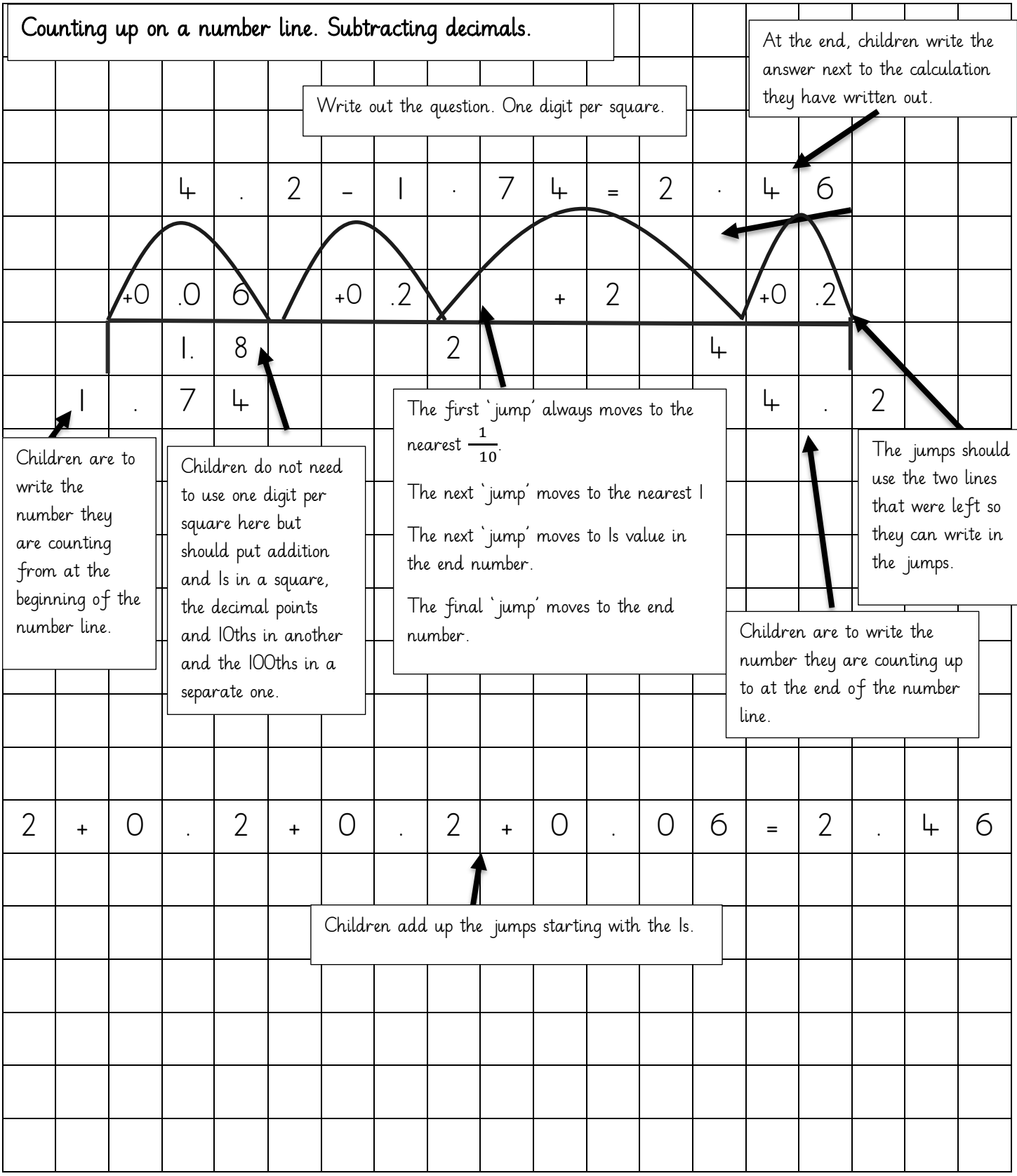
£ 1 0 + £ 5 + £ 2 + 4 0 p + 2 0 p +

3 p + 3 p = £ 1 7 . 6 6

Children add up the jumps starting with the £10s.

When adding the jumps children may want to cross them off as they may become confused.

Counting up on a number line. Subtracting decimals.

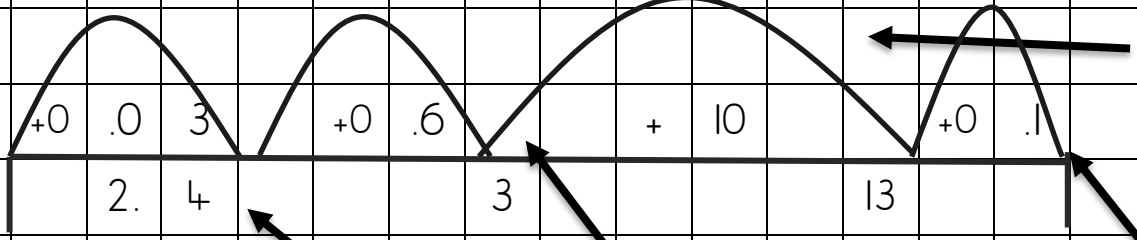


Counting up on a number line. Subtracting decimals.

At the end, children write the answer next to the calculation they have written out.

Write out the question. One digit per square.

13.1 - 2.37 = 10.73



2.4 3 13

2.37 13.1

Children are to write the number they are counting from at the beginning of the number line.

Children do not need to use one digit per square here but should put addition and 1s in a square, the decimal points and 10ths in another and the 100ths in a separate one.

The first 'jump' always moves to the nearest $\frac{1}{10}$.

The next 'jump' moves to the nearest 1

The next 'jump' moves to 1s value in the end number.

The final 'jump' moves to the end number.

The jumps should use the two lines that were left so they can write in the jumps.

Children are to write the number they are counting up to at the end of the number line.

10 + 0.6 + 0.1 + 0.03 =

10.73

Children add up the jumps starting with the 1s/10s.

Compact column subtraction with exchanging for larger numbers.

3	4	6	8	5	-	1	6	4	5	8	=	1	8	2	2	7
						2	14		7	15						
						~~3~~	~~4~~	6	~~8~~	~~5~~						
				-		1	6	4	5	8						
						1	8	2	2	7						

Children write the subtraction they are solving before they present it in a column.

At the end, children write the answer next to the calculation they have written out.

Miss two lines between the question and the working out.

Remind children that this stands for '15' ones, '7' tens, '14' thousands, '2' ten-thousands.

When exchanging, children are to cross out the previous number and write the new number above.

Children can add in a zero when there is no digit in a place value column.

The subtraction sign positioned on the left side on the bottom line of the subtraction.

The children need to recognise that they cannot subtract the 1s (the Commutative Law does not work for either subtraction or division). Children need to make the '5' larger by **exchanging** (do not use the term 'borrowing'). We take '10' from '8' (remind children this means 8 tens so the same as 80) and add it to the '5'. The '80' becomes '70'. Now subtract the 1s.

The children subtract the 10s.

The children subtract the 100s.

The children then need to recognise that they cannot subtract the 1000s (the Commutative Law does not work for either subtraction or division). The children need to make the '4' (remind children this means 4 thousands so the same as 4000) larger by **exchanging** (do not use the term 'borrowing'). We take '10,000' from '3' (remind children this means 3 ten-thousands so the same as 30,000) and add it to the '4' (remind children this means 14 thousands so the same as 14,000). Now subtract the 1000s.

They then subtract the 10,000s.

Subtract unlike fractions including mixed numbers

Children need to recognise that they need to change the denominator so that they are the same.

Remind children whatever happens to the denominator happens to the numerator.

They write what they are multiplying them by in the space that was left.

Leave a space between the fraction and the subtraction.

$$2\frac{3}{4} \quad \begin{matrix} \times 3 \\ \times 3 \end{matrix} \quad - \quad 1\frac{1}{3} \quad \begin{matrix} \times 4 \\ \times 4 \end{matrix} \quad = \quad 1\frac{5}{12}$$

Children then re-write the subtraction with the new fraction. Miss a line between the two calculations.

$$2\frac{9}{12} \quad - \quad 1\frac{4}{12} \quad = \quad 1\frac{5}{12}$$

Children are to place the numbers in the correct place value columns.

Children are to then subtract the whole numbers.

$$2 \quad - \quad 1 \quad = \quad 1$$

Children are to then add the answer for the whole number and the fraction together.

$$1 \quad + \quad \frac{5}{12} \quad = \quad 1\frac{5}{12}$$

Multiplication

Grid method using numbers with up to 2 decimal places x 1-digit numbers.

Children are to draw a grid.

2 rows down.

Column 1 – 1 square

Column 2 – 2 squares

Column 3 – 3 squares

Column 4 – 4 squares

At the end, children write the answer next to the calculation they have written out.

1 . 3 4 x 6 = 8 . 0 4

The multiplication sign positioned in the top left corner of the grid.

X		1	0	.	3	0	.	0	4
6		6	1	.	8	0	.	2	4

Children need to place the numbers into the correct place value in the columns.

The 1-digit number goes underneath the multiplication sign.

The children need to partition the number into 1s, 10ths and 100ths. The 1s go into the column next to the multiplication sign then the 10ths, then the 100ths.

Children then need to multiply the 1-digit number by the partitioned number.

If children struggle with multiplying the 100ths and 10ths e.g. 0.3 x 6. Remind them to solve 3 x 6 then make it 10 times smaller. Or 0.04 x 6. Remind them to solve 4 x 6 then make it 100 times smaller.

6 + 1 . 8 + 0 . 2 4 = 8 . 0 4

The children then add the answers to the multiplications. The can use any method taught to add numbers do not use a new method if it hasn't been taught yet.

Long Multiplication 2-digit numbers x 2-digit numbers.

6 2 x 4 4 = 2 7 2 8

Children are to write out the question then write the numbers in the column layout.

Make sure the numbers are lined up in the correct place value columns – children are to write the place value above each column.

At the end, children write the answer next to the calculation they have written out.

Always write two extra place value columns in case the answer requires it.

Explain to children that we are going to partition the second number '44 = 40 + 4'

We are then going to multiply the first number by each of the two numbers we have after partitioning '62 x 40' and '62 x 4'

The multiplication sign positioned on the left side on the bottom line of the multiplication.

1000s	100s	10s	1s
		6	2
x		4	4
2	4	8	0
		~~8~~	
	2	4	8
	1		
2	7	2	8

40 x 62 or (40 x 2) + (40 x 60).

The carried '80' from '40 x 2'

(4 x 2) + (4 x 60)

Miss 3 lines!

Miss a line between each multiplication and a line at the end as they would for column addition.

The carried '100' from the addition.

Children then add up the answers to the multiplication. Remind children to leave a line as they would do for column addition.

Remind children not to add the carried numbers that are crossed out.

Firstly, children multiply '40 x 62'. They are to work out '40 x 2' to begin with which is '80'. They place the '0' in the 1s column and carry the '80' to the 10s column placing it on the row below. Then they work out '40 x 60' They can multiply '4 x 6' them multiply it by 100 if unsure. They get the answer '240' and add the carried digits.

Next, children multiply '4 x 2'. This equals '8'. They put the '8' in the 1s column.

The children then multiply '4 x 60' and added the carried digits.

Make sure children are crossing out the carried digits when they have added them.

Long Multiplication 3-digit numbers x 2-digit numbers.

3	6	4	x	3	2	=	1	1	6	4	8

Children are to write out the question then write the numbers in the column layout.

Make sure the numbers are lined up in the correct place value columns – children are to write the place value above each column.

At the end, children write the answer next to the calculation they have written out.

Always write two extra place value columns in case the answer requires it.

Explain to children that we are going to partition the second number '32 = 30 + 2'

We are then going to multiply the first number by each of the two numbers we have after partitioning '364 x 30' and '364 x 2'

	1000s	100s	10s	1s
		3	6	4
x			3	2
	1	0	9	2	0
		7	2	8
	1	1	6	4	8

The multiplication sign positioned on the left side on the bottom line of the multiplication.

(30 x 364) Multiply by 10 then multiply by 3.

The carried '100' from '30 x 4' and the carried '1000' from '30 x 60

(2 x 4) + (2 x 60) + (2 x 300)

The carried '100' from '2 x 60'

Miss 3 lines!

Miss a line between each multiplication and a line at the end as they would for column addition.

The carried '1000' from the addition.

Children then add up the answers to the multiplication. Remind children to leave a line as they would do for column addition.

Remind children not to add the carried numbers that are crossed out.

Firstly, children multiply '30 x 364'. Remind children that they can multiply by 10 then 'multiply by 3'. When we multiply a number by 10, we make it 10 times bigger and all the digits move one place to the left and a Zero fills the 1s column. **Children may want to fill the 1s column with a zero first then multiply each number by '3'** When multiplying by '3', you may need to carry. When carrying, write the digit on the row below and cross it out when you have added it.

Next, children multiply '2 x 4'. This equals '8'. They put the '8' in the 1s column.

The children then multiply '2 x 60'. This equals '120'. They put the '20' in the 10s column and carry the '100' into the 100s column and place it on the row below.

Finally, the children multiply '2 x 300' and add the carried digits. Remembering to cross it off once they have added it.

Make sure children are crossing out the carried digits when they have added them.

Long Multiplication 4-digit numbers x 2-digit numbers.

Children are to write out the question then write the numbers in the column layout.

Make sure the numbers are lined up in the correct place value columns – children are to write the place value above each column.

	2	3	6	4	x	2	3	=	5	4	3	7	2

Always write an extra place value column in case the answer requires it.

Explain to children that we are going to partition the second number '23 = 20 + 3'

We are then going to multiply the first number by each of the two numbers we have after partitioning '2364 x 20' and '2364 x 3'

		10000s	1000s	100s	10s	1s	
			2	3	6	4	
		x			2	3	
		4	7	2	8	0	(20 x 2364) (Multiply by 10 then multiply by 2)
			~~1~~				The carried '1000' from '20 x 60'
			7	0	9	2	(3 x 4) + (3 x 60) + (3 x 300) + (3 x 2000)
			~~1~~	~~1~~	~~1~~		The carried '10' from '3 x 4', the carried 100 from '3 x 60' and the carried '1000' from '3 x 300'
		1		1			
		5	4	3	7	2	

The multiplication sign goes on the bottom line of the calculation. Make sure it is placed next to the last place value column.

Miss a line!

The carried '100' and '10,000' from the addition.

Children then add up the answers to the multiplication. Remind children to leave a line as they would do for column addition.

Remind children not to add the carried numbers that are crossed out.

Firstly, children multiply '20 x 2364'. Remind children that they can multiply by 10 then 'multiply by 2'. When we multiply a number by 10, we make it 10 times bigger and all the digits move one place to the left and a Zero fills the 1s column. **Children may want to fill the 1s column with a zero first then multiply each number by '2'** When multiplying by '2', you may need to carry. When carrying, write the digit on the row below and cross it out when you have added it.

Next, children multiply '3 x 4'. This equals '12'. They put the '2' in the 1s column and carry the '10' into the 10s column and place it on the row below.

The children then multiply '3 x 60' and add the carried digits. Remembering to cross off the carried digits when they have added it. This equals '190'. They put the '290' in the 10s column and carry the '100' into the 100s column and place it on the row below.

Then, the children multiply '3 x 300' and add the carried digits. Remembering to cross it off once they have added it. This equals '1000'. They put '0' in the 100s column and carry the '1000' into the 1000s column and place it on the row below.

Short multiplication of decimal numbers using x 100 and ÷100

At the end, children write the answer next to the calculation they have written out.

Firstly, children are to multiply this number by 100 to make it a whole number.

13.72 x 6 = 82.32

13.72 x 100 = 1372

Always write an extra place value column in case the answer requires it.

Children are to write out the question then write the numbers in the short multiplication layout.

Make sure the numbers are lined up in the correct place value columns- children are to write the place value above each column.

	10000s	1000s	100s	10s	1s
		1	3	7	2
x					6
		~~2~~	~~4~~	~~1~~	
		8	2	3	2

The multiplication sign positioned on the left side on the bottom line of the multiplication.

Miss a line!

The carried '10' from '2 x 6', the carried '400' from '70 x 6' and the carried '2000' from '300 x 6'.

When using short multiplication, always start with the lowest value (the 1s) being multiplied.

Children start with '2 x 6' which is '12'. Children write the '2' in the 1s column in the answer space and carry the '10' into the 10s column and place it on the line above the answer space.

Then children solve '70 x 6' which is '420'. Next they add the carried '10' – '430'. They place the '30' (remind children that we only write '3' as '3 tens' = '30') in the 10s column in the answer space and carry the '400' into the 100s column and place it on the line above the answer space.

Next, they solve '300 x 6' which is '1800' and add the carried '400' = '2200'. Children write the '200' (remind children that we only write '2' as '2 hundreds = 200) in the 100s column in the answer space and carry '2000' into the 1000s column and place it on the line above the answer space.

Finally, they solve '1000 x 6' which is '1000' and add the carried '2000' – '8000'. There is nothing left to multiply so children can place the '8000' in the correct place value column in the answer space.

8232 ÷ 100 = 82.32

Finally, as we multiplied the start number by 100, we must now divide it by 100.

Short multiplication of money.

£32.43 x 6 = £194.58

Always write an extra place value column in case the answer requires it.

At the end, children write the answer next to the calculation they have written out.

Children are to write out the question then write the numbers in the short multiplication layout.

Make sure the numbers are lined up in the correct place value columns- children are to write the place value above each column.

The pound sign is in line with the multiplication sign.

Explain that we are still multiplying by '6' even though it seems to be in the $\frac{1}{100}$ column.

The multiplication sign positioned on the left side on the bottom line of the multiplication.

Miss a line!

The carried '10p' from '3p x 6', the carried '£1' from '40p x 6' and the carried '£10' from '£2 x 6'.

Children may want to write the pound sign and the decimal point in the answer box before they begin working it out so they don't forget about them.

	£	100s	10s	1s		$\frac{1}{10}$	$\frac{1}{100}$
	£		3	2	.	4	3
x							6
			~~1~~	~~2~~		~~1~~	
	£	1	9	4	.	5	8

When using short multiplication, always start with the lowest value (the 1s) being multiplied.

Children start with '3p x 6' which is '18p'. Children write the '8p' in the $\frac{1}{100}$ column in the answer space and carry the '10p' into the $\frac{1}{10}$ column and place it on the line above the answer space.

Then children solve '40p x 6' which is '£2.40'. Next they add the carried '10p' – '£2.50'. They place the '50p' (remind children that we only write '5' as '5 tens' = '50') in the $\frac{1}{10}$ column in the answer space and carry the '£2' into the 1s column and place it on the line above the answer space.

Next, they solve '£2 x 6' which is '£12' and add the carried '£2' –'£14'. Children write the '£4' in the 1s column in the answer space and carry '£10' into the 10s column and place it on the line above the answer space.

Multiplying simple pairs of proper fractions

The numerator is positioned in the square above the denominator. Then a line (vinculum) is to be drawn to separate them.

$$\frac{1}{2} \times \frac{1}{4} = \frac{1}{8}$$

Children are to draw these arches to remind them they need to multiply the two numerators and the two denominators.

$$\frac{1}{2} \times \frac{1}{4} = \frac{1 \times 1}{2 \times 4} = \frac{1}{8}$$

Numerators

Denominators

They are to then write the multiplications out as a fraction.

Division

Long division. Dividing 3-digit numbers by 2-digit numbers.

Explain there are two ways to say this division. 834 divided by 24 or how many lots of 24 go into 834?

At the end, children write the answer next to the calculation they have written out.

Children are to write out the question then write the numbers in the long division layout.

Remind children that division is the inverse of multiplication and we can multiplication to help us solve this.

8 3 4 ÷ 2 4 = 3 4 r 1 8

Children need to decide how many lots of '24' are in '834'. They could start with 10 lots although this may take a long time. Encourage children to use their knowledge of making a number 10 times bigger and using the multiplication facts they've written down on the right hand side to decide on how many lots of 10 they are going to take away.

Children are to write out how many lots of '24' they have subtracted.

3 0 + 4 + r 1 8

2 4 | 8 3 4

− 7 2 0

1 0 1 4

− 9 6

1 8

2 4

4 8

7 2

9 6

1 2 0

1 4 4

Children are to write out the first 6 multiples of the divisor '24'. Remind children to help them out they can continue to add '24'.

The subtraction sign is on the left underneath the 1s column of the divisor.

Children should recognise they can no longer take any more lots of '24' away and use this as a remainder.

Long division. Dividing 4-digit numbers by 2-digit numbers.

Explain there are two ways to say this division. 4176 divided by 13 or how many lots of 13 go into 4176?

At the end, children write the answer next to the calculation they have written out.

Children are to write out the question then write the numbers in the long division layout.

Remind children that division is the inverse of multiplication and we can multiplication to help us solve this.

4176 ÷ 13 = 321 r 3

300 + 20 + 1 + r 3

Children need to decide how many lots of '12' are in '4176'. They could start with 10 lots although this may take a long time. Encourage children to use their knowledge of making a number 10 and 100 times bigger and using the multiplication facts they've written down on the right hand side to decide on how many lots of 10 or 100 they are going to take away.

Children are to write out how many lots of '13' they have subtracted.

Children are to write out the first 6 multiples of the divisor '13'. Remind children to help them out they can continue to add '13'.

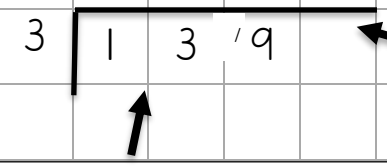
The subtraction sign is on the left underneath the 1s column of the divisor.

Children should recognise they can no longer take any more lots of '13' away and use this as a remainder.

Short division. Dividing 3-digit numbers by 1-digit numbers.

Explain there are two ways to say this division. 139 divided by 3 or how many lots of 3 go into 139?

1 3 9 ÷ 3 = 4 6 r 1



Children are to write out the question then write the numbers in short division layout.

Remind children that division is the inverse of multiplication and we can multiplication to help us solve this.

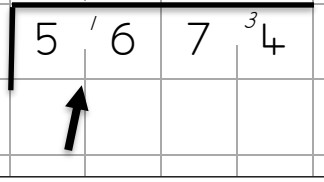
Firstly, children work out how many '3s' go into '1'. They recognise they cannot do that so they put a '0' above the '1' and then look at how many '3s' go into '13' – '4 r 1'. They place the '4' above the '3' and carry the '1' to the '9'.

They then work out how many '3s' go into '19' – '6 r 1'. They place the '6' above the '9'. There is nothing left to carry the '1' to so they leave it as a remainder.

Short division. Dividing 4-digit numbers by 1-digit numbers.

Explain there are two ways to say this division. 5674 divided by 4 or how many lots of 4 go into 5674?

5 6 7 4 ÷ 4 = 1 4 1 8 r 2



Children are to write out the question then write the numbers in short division layout.

Remind children that division is the inverse of multiplication and we can multiplication to help us solve this.

Firstly, children work out how many '4s' go into '5'- '1 r 1' so they put the '1' above the '5' and carry the '1' over the to '6'.

Next, they look at how many '4's go into '16' (remember the carried '1') – '4' so they place the '4' above the '6'.

Then they work out how many '4s' go into 7 – '1 r 3' so they put the '1' above the '7' and carry the '3' over to the '4'.

Finally, they work out how many '4s' go into '34' (remember the carried '3') – '8 r 2'. They place the '8' above the '4'. There is nothing left to carry the '2' over to so they leave it as a remainder.

Use place value to divide 1-place decimals by numbers ≤ 12

Firstly, children are to multiply this number by 10 to make it a whole number.

3 . 6 ÷ 6 = 0 . 6

3 . 6 x 10 = 36

36 ÷ 6 = 6

6 ÷ 10 = 0 . 6

Finally, as we multiplied the start number by 10, we must now divide it by 10.

Use place value to divide 2-place decimals by numbers ≤ 12

Firstly, children are to multiply this number by 100 to make it a whole number.

3 . 65 ÷ 5 = 0 . 73

3 . 65 x 100 = 365

365 ÷ 5 = 73

Children can choose a method to solve this although most will be able to use number facts e.g. counting in 50s and 5s.

73 ÷ 100 = 0 . 73

Finally, as we multiplied the start number by 100, we must now divide it by 100.

Divide proper fractions by whole numbers.

Leave a space between the fraction, the division sign, the whole number and the equals sign.

The numerator is positioned in the square above the denominator. Then a line (vinculum) is to be drawn to separate them.

$\frac{4}{5} \div 3 = \frac{4}{15}$

At the end, children write the answer next to the calculation they have written out.

When writing a whole, children are to use 2 squares.

The question needs to be adjusted so that the whole number becomes a fraction.

The whole number is turned into a fraction. The whole number becomes the denominator - Remember 'down for division'

Children are to draw these arches to remind them they need to multiply the two numerators and the two denominators.

$\frac{4}{5} \div \frac{1}{3} = \frac{4 \times 1}{5 \times 3} = \frac{4}{15}$

Numerators

Denominators

They are to then write the multiplications out as a fraction.