

Division Prior Assessment Question 9

Objective: I use a formal written method to divide a 4-digit number by a 2-digit number.

NASMD2: divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions.

NASMD3: divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate.

Teacher Input Ideas:

For a starter, you may want the children to write from 11 to 20 x tables. Each group could be given one and check these on a calculator. These could then be displayed around the classroom to help children during the activities.

Introduce the children to a problem where the divisor is more than ten. For example, 14 of the same football shirts were bought by a football team. The total amount was £434. How much did each shirt cost?

Ask the children to think about how they would work this out. What are they being asked to work out? Children may try and do this with the bus stop method. Ask why is it harder this time? What is making it difficult? Establish that sometimes we need to divide an amount by a number larger than a one digit number. Therefore, the divisor may be a 2-digit number. This can make the calculation harder and the bus stop method more challenging.

$$\begin{array}{r} 031 \\ 14 \overline{) 434} \end{array}$$

Encourage the children to write their 14 x tables down the side of their whiteboard or look at the ones displayed around the classroom.

We cannot make 100 groups of 14 with 434, so the 4 can be carried across to the tens column. We can make 30 groups of 14 with the 43 tens. 1 lot of ten remains. You can make one group of 14 with 1 ten and 4 ones. No remainders.

Introduce the children to a problem 12 of the same bikes were bought by a cycling club. The total amount was £3132. How much did each bike cost?

$$\begin{array}{r}
 0261 \\
 12 \overline{) 3132} \\
 \underline{3132} \\
 0
 \end{array}$$

Display the 12 x table down the side whilst modelling so the children can see explicit link: 12 goes into 31 2 times remainder 7 (2 lots of 12 is 24 so $31 - 24 = 7$)

12 goes into 73 6 times as 6×12 is 72, remainder 1.

12 goes into 12 once.

Discuss the use of vocabulary. Some children will use goes in to but ensure you are also modelling how many groups make as above to ensure understanding of place value.

Some people also lay this out in another method called the long division method to show the working out they are doing. This helps when the amounts are harder and we need to mentally find remainders and how many groups go into,

$$\begin{array}{r}
 261 \\
 12 \overline{) 3132} \\
 \underline{31} \\
 -24 \\
 73 \\
 \underline{ 72} \\
 12 \\
 \underline{ 12} \\
 0
 \end{array}$$

Some people prefer more space and use this part to help work out the remainder to carry over rather than mentally. This is called the long division method. Any carrying I do, I carry down for more space

I carry the 3 down as 12 goes into 3 no times.

12 goes into 31 2 times ($2 \times 12 = 24$) I have taken 24 from 31 to find the remainder and then carried this down for more space to work out.

I carry the 3 down from the amount as instead of writing the 7 next to the 3, I place the 3 next to my 7.

12 goes into 73, 6 times (12×6 is 72) so $73 - 72$ as I want to find the remainder = 1 carry the 1 and the 2 from the top down

12 goes into 12 1 time.

Introducing this now alongside the short method will help some children to see the link.

Try for another:

$$\begin{array}{r}
 0369 \\
 17 \overline{) 6273} \\
 \underline{6115} \\
 0
 \end{array}$$

$$3 \times 17 = 51 \quad (62 - 51 = \text{remainder } 11)$$

$$117 \quad (6 \times 17 = 102 \quad 117 - 102 = 15 \text{ remainder})$$

$$153 \quad 9 \times 17 = 153$$

Encourage the children to notice that it is difficult to fit this in in the space provide and it requires a lot of mental remembering and calculating to find the remainders, so the long division method provides more support here.

$$\begin{array}{r}
 \text{0 3 6 9} \\
 17 \overline{) 6273} \\
 \underline{51} \\
 117 \\
 \underline{102} \\
 153 \\
 \underline{153} \\
 0
 \end{array}$$

$3 \times 17 = 51 \quad 62 - 51 = \text{remainder } 11$
 $17 \times 6 = 102 \quad 117 - 102 = \text{remainder } 15$
 $9 \times 17 = 153$
 0 reminders

For some sums, it is more difficult to do the short method due to space and reliance on mental methods such as

$$\begin{array}{r}
 \text{8 6} \\
 15 \overline{) 1290} \\
 \underline{120} \\
 90 \\
 \underline{90} \\
 0
 \end{array}$$

I must carry the 1 & the 2 as 15 does not go into 1 or 12 so I still must work out how many times 15 goes in to 129 and the space can be difficult for me to do so.
 $15 \times 8 = 120$ (again prompt children to write 15 x tables/display in class)
 remainder 9
 $6 \times 15 = 90$

Encourage children that are ready to try the long division method for this to compare. Now try with higher 2-digit numbers and children to use the long division method.

$$\begin{array}{r}
 \text{7 8} \\
 34 \overline{) 2652} \\
 \underline{238} \\
 272 \\
 \underline{272} \\
 0
 \end{array}$$

encourage children to write facts they know about 34 or 34 x table to 10
 $34 \times 7 = 238 \quad 265 - 238 = 27 \text{ remainder}$
 $34 \times 8 = 272$

Practice Activities

Purple Practice: Most suited for children who made errors in Q9 of the prior learning assessment and would benefit from securing the use of the short division method for dividing 3 and 4 digit numbers by 2 digit numbers.

The questions are presented as word problems for the children, however as the learning objective is to divide a 4-digit number by a 2-digit number, the problems are single step, with easy to identify use of operation and amounts.

The questions on this activity can all be divided by using the short method and the divisor is only ever a number between 10 and 20. To further support children having difficulty with x table facts between 10 and 20, encourage the use of aids such as timetable grids for these numbers or the timetables displayed around the classroom as suggested in the starter.

Green Practice: most suited for children who attempted to answer Q9 using the short method. They will benefit from securing the short method for 2 digit divisors and begin to use the long method.

The children are presented with sums where the divisor is a low 2-digit number. They are encouraged to use the short method and the long method to calculate the answers and compare the answers, checking they have the same result. Encourage the children to use both methods and record any timetables they need to help with accuracy.

Yellow Practice most suited for children who demonstrated accuracy in Q9 using the short method, and will benefit from developing understanding of using the long method with 2 digit divisors.

The children can be presented with the task as a sheet or the blocks can be cut up for a group of children. They are to pick 2 blocks at a time, selecting a 4-digit number to be divided by a 2-digit number. The blocks provide opportunities for the children to use the long division method and some of the combinations include remainders. The children can be further challenged to write the remainders as fractions and simplified fractions to apply prior learning and fluency opportunities.

Mastery: The children are presented with data collected by a class of year 6 children. The children are encouraged to apply the use of addition written methods and long division to find the mean average from the data provided. There is a fluency opportunity for the children to apply their knowledge of the mean, if previously taught, by hiding the formula provided on the task. However, the task is still accessible for all children, as the formula is provided, therefore the focus can be on applying addition and long division methods.

Answers:

Purple:

1) 22

2) £269 pounds

3) 45 pages

4) 356

5) Yes 32 children will be able to get some.

Green:

a) 54

b) 469

c) 81

d) 56

e) 80

f) 364

Yellow: Some combinations to check children's answers.

$$2304 \div 24 = 96$$

$$2304 \div 16 = 144$$

$$2304 \div 48 = 48$$

$$3936 \div 48 = 82$$

$$3936 \div 24 = 164$$

$$3936 \div 36 = 109 \text{ r}12/36 \text{ or } 1/3$$

$$4464 \div 48 = 93$$

Mastery:

The mean average is **148**

LO: I use the short division method to divide up to a 4-digit number by a 2-digit number.

1) A theatre can hold 352 people at one time. Each row can seat 16 people. How many rows are there in the theatre?

2) A department store sells 11 of the same TV in one week. The total they were sold for is £2959. How much does each TV cost?

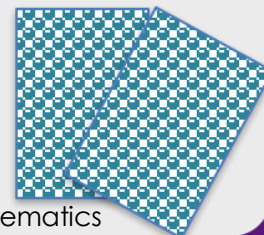


3) Sacha collects football stickers. She has filled her football album with 675 stickers. Each page can hold 15 stickers? How many pages does her book have?



4) Teighlor and Pritesh are holding a sweet sale for charity. They have 4628 sweets in total. They are going to put 13 sweets into each bag. How many bags will they have ready to sell?

5) Mrs Simons has 608 stickers to share with her class at the end of the year. She has 30 children in her class. If she gives each child 19 stickers, will there be enough for every child?



Look at each division question. Use the short division method and the long division method to calculate the answer.

a)

$$594 \div 11$$

short method:

long method:

b)

$$6566 \div 14$$

short method:

long method:

c)

$$1053 \div 13$$

short method:

long method:

d)

$$1008 \div 18$$

short method:

long method:

e)

$$1120 \div 14$$

short method:

long method:

f)

$$9464 \div 26$$

short method:

long method:

Yellow Practice

LO: I can divide a 4-digit number by a 2-digit number using the long division method.

Pick a 4-digit number and divide this by a 2-digit number using the long division method.

TIP: Some of your calculations may have remainders.

2304

24

3936

16

8760

36

5580

18

4464

48

9888

96

In class 6G, the children want to find out the average height of children aged 11.

They measure all eleven year olds in the class and record their heights.

Child	Height in cm
Grace	149
Poppy	152
Samuel	145
Mohammed	150
Pritesh	149
Jordan	148
Riya	143
Veronika	154
Daniel	158
Oskar	151
Shay	147
Zenobia	141
Lujain	145
Manoah	140

The children use this formula to find the mean average height of eleven year olds in their class:

$$\text{total of all heights} \div \text{total number of children}$$

What is the mean average height of eleven year olds in class 6G?