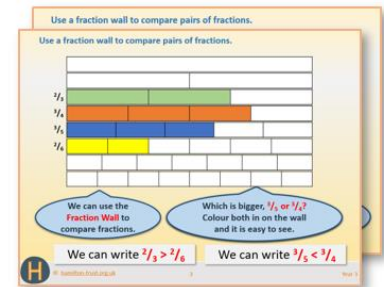


Week 11, Day 4

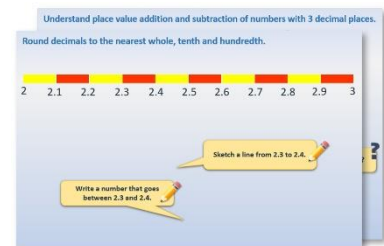
Written multiplication and division

Each day covers one maths topic. It should take you about 1 hour or just a little more.

1. If possible, watch the **PowerPoint presentation** with a teacher or another grown-up.



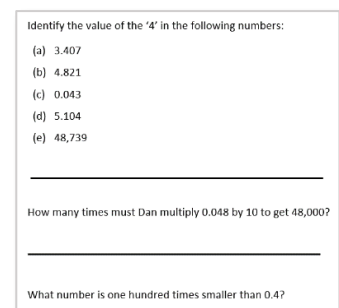
OR start by carefully reading through the **Learning Reminders**.



2. Think you've got it? Have a go at the **Investigation** or **Practical Activity**.



3. Have I mastered the topic? A few questions to **Check your understanding**.
Fold the page to hide the answers!



Learning Reminders

Use short division.

Today there will be a choice of three investigations using **short division**, **long division** and **short multiplication**, so let's remind ourselves of those methods.

What is the digit sum of 333? **9**

We are going to work out $333 \div 9$.

Before we begin, roughly how many 9s do you think will be in 333?

We cover the 10s and 1s digits. How many 9s in 3?

How many 9s in 33?

We write the 6 tens that we have left over in front of the 1s.

How many 9s in 63?

9 | 3

None, so we move the Post-it along.

9 | 3 3⁶

9 | 3 3⁶ 3


3

37

Learning Reminders

Use long division.

What is the digit sum of 555? **15** ?

We are going to work out $555 \div 15$. 

Before we begin, roughly how many 15s do you think will be in 555? ?

Multiples of 15

15
30
45
60
75
90
105
120
135
150

Let's write multiples of 15 to help us.

Long division

$$\begin{array}{r} 30 + 7 \\ 15 \overline{) 555} \\ \underline{-450} \\ 105 \\ \underline{-105} \\ 0 \end{array}$$

this is **30** x 15

this is **7** x 15

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Learning Reminders

Use short multiplication.

$$6 \times 1089$$



How might you work out the answer?

x	1000	0	80	9	
6	6000	0	480	54	6534

Add the numbers.

We don't really need this column!

$$\begin{array}{r} 1089 \\ \times \quad 6 \\ \hline 55 \\ 6534 \end{array}$$

Multiply the 1s first, then the 10s, then the 100s, then the 1000s. Remember to leave a line for any 'carry' digits during addition.

Investigation Mild

Amazing 1089

- Multiply 1089 by 1
- Write the digital root of the answer (9)
- Multiply 1089 by 2
- Write the digital root of the answer
- Repeat these steps up to 1089×9
- Write all the answers in a table
- Identify as many patterns as you can
- What happens when your multiplier goes above 9?

1	0	8	9
2	1	7	8
3	2	etc.	

Investigation Hot

Division digit surprise

- Write a 3-digit number with all digits the same, e.g. 444.
- Add the three digits, e.g. $4 + 4 + 4 = 12$.
- Use either short division or long division to divide your 3-digit number by the sum of the digits, e.g. $444 \div 12$.
- Write down your answer.
- Repeat for as many other 3-digit numbers (all digits the same) as you can.
- What happens?

Investigation Super Hot Amazing 6720

Solve the following divisions:

- a. $6720 \div 2 =$
- b. $6720 \div 4 =$
- c. $6720 \div 6 =$
- d. $6720 \div 8 =$
- e. $6720 \div 10 =$
- f. $6720 \div 12 =$
- g. $6720 \div 14 =$
- h. $6720 \div 16 =$

All your answers should be whole numbers... Why is that?

Super challenge! Find a number which leaves no remainders when divided by 2, 3, 4, 5, 6, 7 and 8. Is this the smallest such number? What other numbers share this property?

Check your understanding

Questions

Maya says that 2578×4 gives the same product as 8×1289 .

Is she correct? Demonstrate why/why not.

If Sally multiplies a number by 12, she gets 9,432.

What was her starting number?

Tom multiplies his number by 9 and gets 7074.

What was his starting number?

A farmer is packing eggs in boxes of 6.

She has 980 eggs to pack.

- i) How many boxes can the farmer fill using 980 eggs?
 - ii) How many boxes will she need to hold all 980 eggs?
-

Answers on the next page

Check your understanding

Answers

Maya says that 2578×4 gives the same product as 8×1289 .

Is she correct? Demonstrate why/why not.

Maya is correct, the product of each is 10,312.

Comparing the two questions, 4 has been doubled and 2578 halved, which produces the same product.

If Sally multiplies a number by 12 she gets 9,432.

What was her starting number? 786.

Tom multiplies his number by 9 and gets 7074.

What was his starting number? 786.

Solved by division – for some children ‘multiplies’ is a trigger to do just that, rather than the division (as the reverse of multiplication) needed to solve these.

A farmer is packing eggs in boxes of 6.

She has 980 eggs to pack.

i) How many boxes can the farmer fill using 980 eggs? 163.

ii) How many boxes will she need to hold all 980 eggs? 164

Since $980 \div 6 = 163r2$ (or $\frac{2}{6}$), the answer to the first problem means rounding down and the second rounding up. A child simply giving 163r2 has solved the division but not answered the problems.
