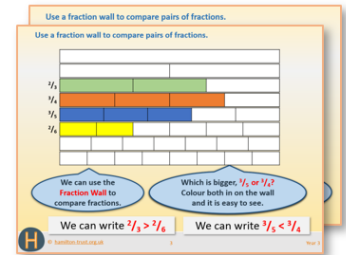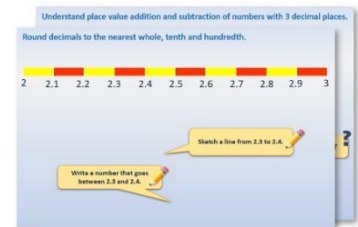# Week 14, Day 1
Use short division to divide, including writing remainders.
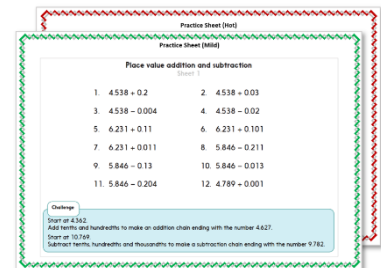### Each day covers one maths topic. It should take you about 1 hour or just a little more.

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

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

   _____

2. Tackle the questions on the **Practice Sheet**.
   There might be a choice of either Mild (easier) or Hot (harder)!
   Check the answers.

   _____

3. Finding it tricky? That's OK… have a go with a grown-up at **A Bit Stuck?**

   _____

4. Think you've cracked it? Whizzed through the Practice Sheets?
   Have a go at the **Investigation**…

Learning Reminders

Use short division to divide 3 and 4-digit numbers by 1-digit numbers, including those that leave a remainder.

Solving 547 ÷ 3 using short division

Start by dividing 5 by 3.
There is one 3 in 5 and 2 left over.
So, write **1** above the line, in the 100s place.
Write the 2 left over in front of the next digit.

Now divide 24 by 3.
There are exactly eight 3s in 24.
So, write **8** above the line, in the 10s place.

Now divide 7 by 3.
There are two 3s in 7, and 1 left over.
So, write **2** above the line, in the 1s place.
There is 1 left over, so we write r **1**.

$$1\ 8\ 2\ r\ 1$$
$$3\overline{)5^2 4\ 7}$$

The answer is **182 r 1**.

Learning Reminders

Use short division to divide 3 and 4-digit numbers by single-digit numbers, including those that leave a remainder.

$$1381 \div 6$$

Now let's try an example with 4 digits! Roughly how many 6s are in 1381?

$200 \times 6 = 1200$ and $300 \times 6 = 1800$. The answer must lie between 200 and 300.

Set out the question carefully. Leaving a space between digits for any extra digits we may need to write in.

$$6 \overline{\smash{)}1\ 3\ 8\ 1}$$

Learning Reminders

Use short division to divide 3 and 4-digit numbers by 1-digit numbers, including those that leave a remainder.

Start with the 1000s. There are no 6s in 1 so leave a space above the 1 and move on.

Now divide 13 by 6.
There are two 6s in 13 and 1 left over.
So, write **2** above the line, in the 100s place.
Write the 1 left over in front of the next digit.

Now divide 18 by 6.
There are exactly three 6s in 18.
So, write **3** above the line, in the 10s place.

There are no 6s in 1.
Write 0 above the line in the 1s place.
There is 1 left over, so write r 1.

$$2 \ 3 \ 0 \ r \ 1$$
$$6 \overline{)1 \ 3 \ {}^1 8 \ 1}$$

The answer is 230 r 1.

Practice Sheet Mild
Short division with remainders

1. $542 \div 4$

2. $523 \div 3$

3. $746 \div 5$

4. $638 \div 3$

5. $982 \div 4$

6. $249 \div 4$

7. $341 \div 4$

8. $283 \div 3$

9. $364 \div 5$

10. $754 \div 6$

Challenge

Alys says 'The biggest remainder you can have when you divide by 6 is 5.'
Do you agree with her?
Explain your reasoning...

Practice Sheet Hot
Short division with remainders

1. $5237 \div 4$

2. $8351 \div 6$

3. $8343 \div 8$

4. $2734 \div 5$

5. $9535 \div 4$

6. $2347 \div 3$

7. $1429 \div 4$

8. $1532 \div 7$

9. $4735 \div 6$

10. $5391 \div 8$

Challenge

Write two different 4-digit numbers which when divided by 5 will give a remainder of 2.

Write two different 4-digit numbers which when divided by 4 will give a remainder of 3.

Practice Sheet Answers

Practice Sheet (Mild)

1. 542 ÷ 4 = 135 r2
2. 523 ÷ 3 = 174 r1
3. 746 ÷ 5 = 149 r1
4. 638 ÷ 3 = 212 r2
5. 982 ÷ 4 = 245 r2
6. 249 ÷ 4 = 62 r1
7. 341 ÷ 4 = 85 r1
8. 283 ÷ 3 = 94 r1
9. 364 ÷ 5 = 72 r4
10. 754 ÷ 6 = 125 r4

Challenge

Yes, Alys is correct. If the remainder is bigger than 5, then more groups of 6 can be made.

Practice Sheet (Hot)

1. 5237 ÷ 4 = 1309 r1
2. 8351 ÷ 6 = 1391 r5
3. 8343 ÷ 8 = 1042 r7
4. 2734 ÷ 5 = 546 r4
5. 9535 ÷ 4 = 2383 r3
6. 2347 ÷ 3 = 782 r1
7. 1429 ÷ 4 = 357 r1
8. 1532 ÷ 7 = 218 r6
9. 4735 ÷ 6 = 789 r1
10. 5391 ÷ 8 = 673 r7

Challenge

Write two different 4-digit numbers which when divided by 5 will give a remainder of 2.
e.g. 1712 ÷ 5 = 342 r2 and 2817 ÷ 5 = 563 r2
Write two different 4-digit numbers which when divided by 4 will give a remainder of 3.
e.g. 2651 ÷ 4 = 662 r3 and 3135 ÷ 4 = 783 r3

Work in pairs

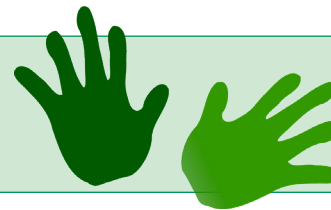**Things you will need**:
• A pencil

What to do:

• Choose a division.

• Work out the answer individually.

• Share your jottings with your partner.

• Repeat at least four more times.

• Score 10 points for each correct answer between 10 and 20, 20 points for each answer between 20 and 30, and also the remainder as a bonus!

$111 \div 4$	$53 \div 3$	$125 \div 5$	$97 \div 4$	$84 \div 6$
$110 \div 9$	$84 \div 3$	$75 \div 4$	$132 \div 5$	$139 \div 5$

$114 \div 4 = 28 \ r \ 2$

20×4 8×4 r2

0   80   112   114
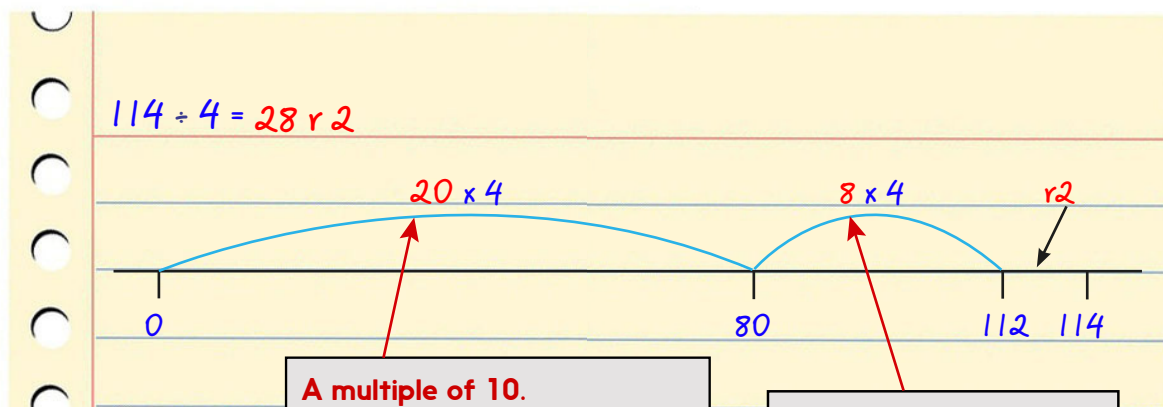
A multiple of 10.
In this example, 30 lots of 4 (120) would be more than the number being divided.

20 x 4 is the largest 'chunk' of 10x the divisor (4) that will 'fit' into the dividend (114).

How many 4s will fit into what's left? 9 x 4 is 36. 80 and another 36 would jump to 116, which is more than the target of 114.

S-t-r-e-t-c-h:
Work out 20 x 5, 30 x 5, 20 x 3 and 30 x 3.
Use the answers to help work out $172 \div 5$ and $103 \div 3$.

Learning outcomes:
• I can use chunking to divide, giving answers between 10 and 30, with remainders.
• I am beginning to use chunking to divide, giving answers between 30 and 40, with remainders.

Investigation
Investigating remainders

1262	**1862**	**1922**

- Choose one of the numbers and divide it in turn by 3, 4, 5 and 6.

- Record each division, and the remainder, what do you notice?

- Now try the same with the other two numbers, what happens this time?

- How can you explain this?

> **Clue!**
> Try subtracting 2 from each of the three starting numbers and think about what you know about factors and multiples...

- Find the difference between 1862 and 1262; then between 1922 and 1862.

- Use that information to find two more numbers that will give you the same results when you divide them by 3, 4, 5 and 6.

- How can you be sure without even trying out the divisions?

Wow!
That's amazing...

Challenge

Can you find three 5-digit numbers that will also produce the same remainder when dividing by 3, 4, 5 and 6?
Try to include at least one number that doesn't begin with 6!