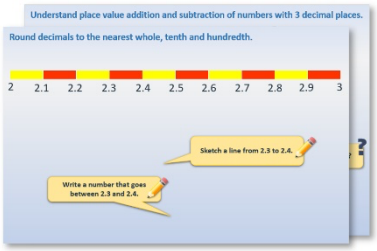
Week 8, Day 2
Grid multiplication (2)

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

1. Start by reading through the **Learning Reminders**.
   They come from our *PowerPoint* slides.



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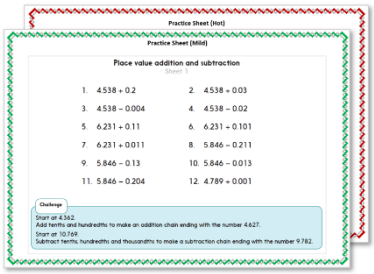
2. Tackle the questions on the **Practice Sheet**.
   There might be a choice of either Mild (easier) or Hot (harder)!
   Check the answers.



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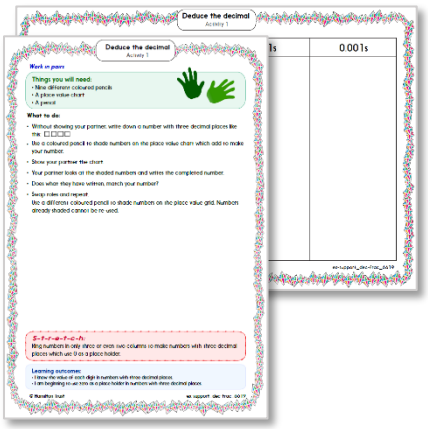
3. Finding it tricky? That's OK… have a go with a grown-up at **A Bit Stuck?**



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

Learning Reminders

Use partitioning to multiply 3-digit numbers by 1-digit numbers.

6 × 376, 319 × 5, 3 × 482, 407 × 4.

Which of these will have the biggest answer?

Round the 3-digit number and multiply to estimate the answers.

Write down your approximations for each.

Which of these could we do without using a written method?

407 × 4

400 × 4 = 1600, 7 × 4 = 28
and 1600 + 28 = 1628.

Learning Reminders

Use partitioning to multiply 3-digit numbers by 1-digit numbers.

Try 6 × 376 using the grid method.

Try 319 × 5 using the grid method.

×	300	70	6	
6	1800	420	36	2256

×	300	10	9	
5	1500	50	45	1595

6 × 376 = 2256, 319 × 5 = 1595, 3 × 482, 407 × 4 = 1628

Compare your answers with your estimates. Are you surprised by any of the results?

3 x 482 =

x	400	80	2
3	1200	240	6

1200 + 240 + 6 = 1446

Practice Sheet Mild

Partitioning to multiply

Before you start, which multiplication do you think will have the smallest answer?
And the biggest answer?

3 x 121	6 x 531
352 x 4	454 x 5
3 x 235	4 x 512
244 x 6	423 x 3
5 x 113	4 x 345

Challenge

Find the missing numbers:

x	300	☐	7
☐	☐	240	56

= ☐

Practice Sheet Hot

Partitioning to multiply

Before you start, which multiplication do you think will have the smallest answer?
And the biggest answer?

324 x 3	365 x 6
437 x 5	463 x 4
4 x 582	8 x 508
6 x 206	3 x 213
132 x 8	5 x 145

Challenge

Will 354 x 6 have a larger or smaller answer than 654 x 3? How do you know?

Will 315 x 4 have a larger or smaller answer than 415 x 3? How do you know?

Practice Sheet Answers

Partitioning to multiply (Mild)

3 × 121 = 363
352 × 4 = 1408
3 × 235 = 705
244 × 6 = 1464
5 × 113 = 565

6 × 531 = 3186
454 × 5 = 2270
4 × 512 = 2048
423 × 3 = 1269
4 × 345 = 1380

Partitioning to multiply (Hot)

324 × 3 = 972
437 × 5 = 2185
4 × 582 = 2328
6 × 206 = 1236
132 × 8 = 1056

365 × 6 = 2190
463 × 4 = 1852
8 × 508 = 4064
3 × 213 = 639
5 × 145 = 725

Challenge

x	300	30	7
8	2400	240	56

= 2696

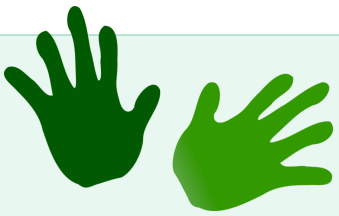
Challenge

354 x 6 will have a larger answer than 654 x 3.
315 x 4 will have a smaller answer than 415 x 3.

A Bit Stuck?
Grid luck

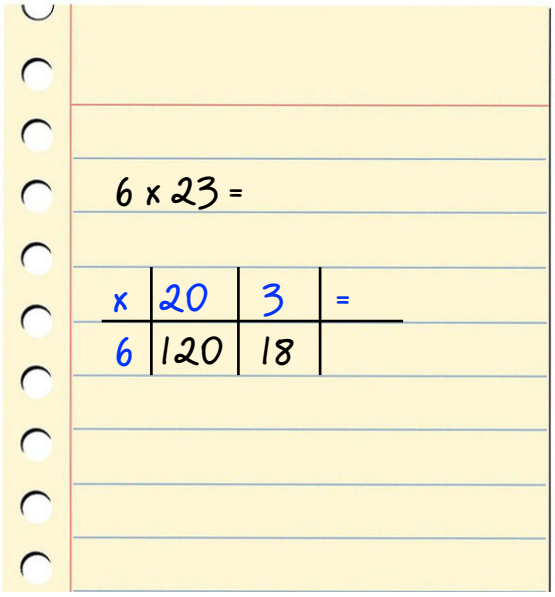
Discuss your work together, in pairs

Things you will need:
- A pencil



What to do:

- Use the grid method to work out the multiplications on the sheet.
- Start by partitioning the 2-digit number. Write the numbers in the correct places on the grid along the top.
- Write the 1-digit multiplier on the grid.
- Multiply the numbers and write the answers.
- Add the answers and complete the number sentence for the calculation.
- You can use the place value grid to help you multiply by 10 and 100.



S-t-r-e-t-c-h:

Use the digits 2, 3, 4 and 5 in any order that you wish to make a 3-digit by 1-digit multiplication, e.g. 5 x 342. Find the answer using the grid method.
The person who has the answer closest to 1000 wins.

Learning outcomes:
- I can use the grid method to multiply 2-digit numbers by 1-digit numbers.
- I am beginning to use the grid method to multiply 3-digit numbers by 1-digit numbers.

A Bit Stuck?
Grid luck

100s	10s	1s

 Explore more Hamilton Trust Learning Materials at https://wrht.org.uk/hamilton

A Bit Stuck?
Grid luck

4 x 35 =

x	30	5	=
4			

3 x 42 =

6 x 32 =

A Bit Stuck?
Grid luck

4 x 235 =

x	200	30	5	=
4				

6 x 123 =

x				=

3 x 315 =

Investigation
Roots

- For this investigation you need to know how find a digital root.

Digital Root
Add the digits of a number.
Keep adding until you get a 1-digit number.

Example
1753 add the digits
1 + 7 + 5 + 3 = 16
1 + 6 = 7
Digital root = **7**

- Choose a 3-digit number to multiply by a 1-digit number, using the grid method.
- Before you start, find the digital root of the 3-digit number.
  Then multiply it by your chosen 1-digit number and find the digital root of the answer.
- After you have multiplied the 3-digit number by your chosen 1-digit number, find the digital root of the answer.
- What do you find?
- See if what you have found works for other numbers too.

Example: 426 × 6

Digital root of 426:
4 + 2 + 6 = 12, then 1 + 2 = 3

3 × 6 = 18 and 1 + 8 = 9

426 × 6

x	400	20	6
6	2400	120	36

Answer = 2556
Digital root is 2 + 5 + 5 + 6 = 18 and 1 + 8 = 9