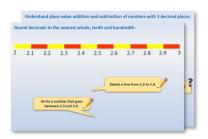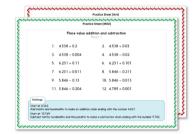# Week 10, Day 2
Use column subtraction to subtract 3-digit numbers
Each day covers one maths topic. It should take you about 1 hour or just a little more.

1. Start by reading through the **Learning Reminders**. They come from our *PowerPoint* slides.
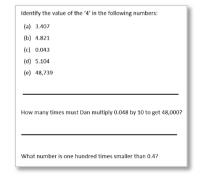
2. Tackle the questions on the **Practice Sheet**. There might be a choice of either Mild (easier) or Hot (harder)! Check the answers.
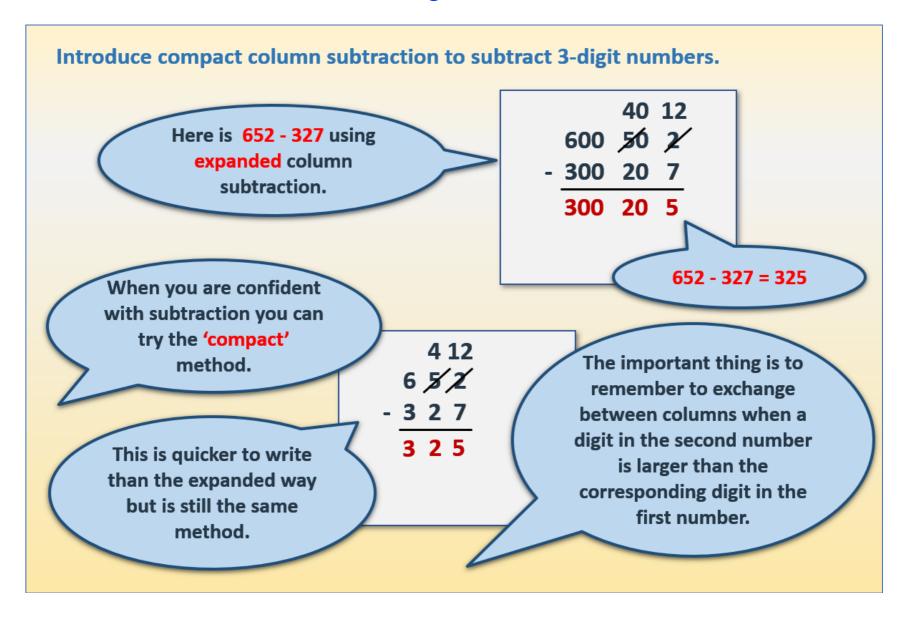
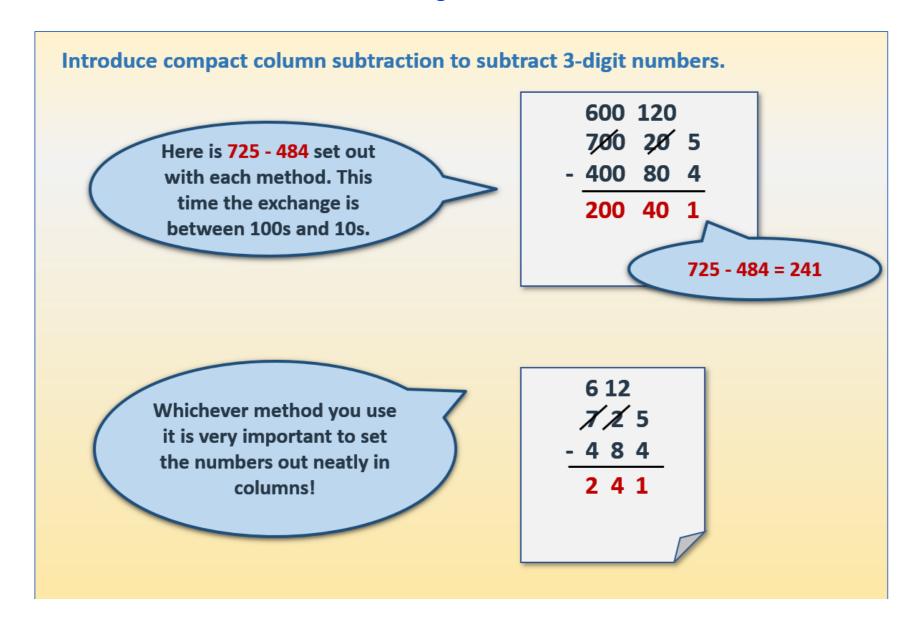3. Finding it tricky? That's OK… have a go with a grown-up at **A Bit Stuck?**

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

Learning Reminders

Introduce compact column subtraction to subtract 3-digit numbers.

Here is **652 - 327** using **expanded** column subtraction.

$$
\begin{array}{r}
\ 40\ \ 12 \\
600\ \ \cancel{50}\ \ \cancel{2} \\
-\ 300\ \ 20\ \ 7 \\
\hline
300\ \ 20\ \ 5
\end{array}
$$

652 - 327 = 325

When you are confident with subtraction you can try the **'compact'** method.

$$
\begin{array}{r}
4\ 12 \\
6\ \cancel{5}\ \cancel{2} \\
-\ 3\ 2\ 7 \\
\hline
3\ 2\ 5
\end{array}
$$

The important thing is to remember to exchange between columns when a digit in the second number is larger than the corresponding digit in the first number.

This is quicker to write than the expanded way but is still the same method.

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

Learning Reminders

Practice Sheet Mild
Expanded column subtraction

1.   764 – 328 =

```
            50    14
   700     6̶0    4̶
 - 300     20     8
                   6
```

2.   835 – 451 =

```
   700    130
   8̶0̶0̶   3̶0̶    5
 - 400     50    1
                  4
```

Set out these questions in the same way:

3.   645 – 228

4.   961 – 627

5.   736 – 552

6.   528 – 253

7.   940 – 316

8.   527 – 342

Now have a go at questions 1, 3, 5 and 7 using the compact method. Check you find the same answers!

Challenge

1.   Harry has £248 in his bank account. He buys a bike for £157. How much does he have left?

2.   Write your own number story for a partner to solve where they have to do a column subtraction.

Practice Sheet Hot
Column subtraction

1. 973 – 328

2. 745 – 367

3. 925 – 481

4. 713 – 572

5. 640 – 328

6. 827 – 542

7. 823 – 567

8. 745 – 347

9. 635 – 328

10. 562 – 386

Challenge

Find two pairs of 3-digit numbers whose difference is 238.

Practice Sheets Answers

green
Expanded column subtraction (mild)

1. 764 – 328 = 436

		50	14
	700	60	4
–	300	20	8
	400	30	6

2. 835 – 451 = 384

		700	130	
		800	30	5
–		400	50	1
		300	80	4

3. 645 – 228 = 417

		30	15
	600	40	5
–	200	20	8
	400	10	7

4. 961 – 627 = 334

		50	11
	900	60	1
–	600	20	7
	300	30	4

5. 736 – 552 = 184

		600	130	
		700	30	6
–		500	50	2
		100	80	4

2. 528 – 253 = 275

		400	120	
		500	20	8
–		200	50	3
		200	70	5

3. 940 – 316 = 624

		30	10
	900	40	0
–	300	10	6
	600	20	4

4. 527 – 342 = 185

		400	120	
		500	20	7
–		300	40	2
		100	80	5

Challenge

1. £248 - £157 = £91   Harry has £91 left.
2. Check that the calculation can not be quickly solved mentally.

Column subtraction (hot)

1. 973 - 328 = 645
2. 745 - 367 = 378
3. 925 - 481 = 444
4. 713 - 572 = 141
5. 640 - 328 = 312
6. 827 - 542 = 285
7. 823 - 567 = 256
8. 745 - 347 = 398
9. 635 - 328 = 307
10. 562 - 386 = 176

Challenge

Find two pairs of 3-digit numbers whose difference is 238.
e.g. 824 – 586
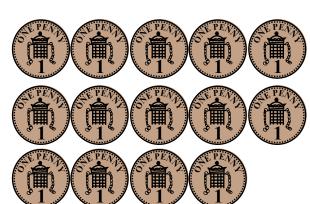   763 - 525

You will need:
- 1p and 10p coins

What to do:
- We want to calculate 64 - 28. Find the coins to make 64p.
  Write the calculation as an expanded column subtraction:

```
   60    4
 − 20    8
 ─────────
```

8 is larger than 4 so we exchange a 10 for ten 1s:

```
   50   14
   6̶0̶    4̶
 − 20    8
 ─────────
```

Now subtract eight 1ps and two 10ps... 14 − 8 = 6 and 50 − 20 = 30:

```
   50   14
   6̶0̶    4̶
 − 20    8
 ─────────
   30    6
```

64 − 28 = 36

- Now try these questions, setting out in columns and using the coins to help with exchanges:

  1. 42 - 18   2. 61 - 37

  3. 73 - 48   4. 82 - 38

  5. 54 - 26

Investigation
Target subtractions

1 2 3 4 5 6 7 8 9

- Use expanded or compact column subtraction to find answers to these:

  584 – 256   529 - 175   656 - 273

- For each one, how many exchanges did you make between columns?
  Did you have to exchange a 10 to get ten 1s?
  Did you have to exchange a 100 to get ten 10s?

- Use the number cards to create three 3-digit - 3-digit subtractions, where you *do not* need to make any exchanges between columns.

- How did you choose which digits to put in which place in your numbers?

- Now try to create three 3-digit - 3-digit subtractions where you will have to make **two** exchanges, one between 100s and 10s and one between 10s and 1s.
  Which digits will you put in which place in your numbers this time?

- Look at these 5 questions. Without solving them, identify which will need:
  (a) two column exchanges
  (b) one column exchange
  (c) no exchanges

  487 – 134   563 – 422   324 – 177

  649 – 358   454 – 227

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