

## Week 11, Day 2

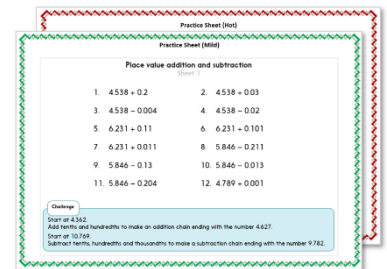
### Column subtraction of 4-digit numbers

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

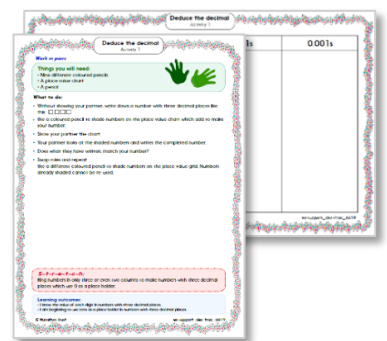
1. Start by reading through the **Learning Reminders**. They come from our *PowerPoint* slides.



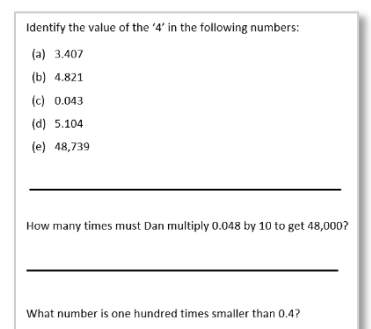
2. Tackle the questions on the **Practice Sheet**. There might be a choice of either **Mild** (easier) or **Hot** (harder)! Check the answers.



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

### Column subtraction of 4-digit numbers.

We can use **expanded or compact column subtraction** to subtract 4-digit numbers. It is the same as with 3-digit numbers, just an extra column!

$$\begin{array}{r} \phantom{5}000 \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\ \phantom{5}000 \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\ - \phantom{5}000 \phantom{0} \phantom{0} \phantom{0} \phantom{0} \\ \hline \phantom{5}000 \phantom{0} \phantom{0} \phantom{0} \phantom{0} \end{array}$$

$$2000 + 400 + 80 + 1 = 2481$$

5937 - 3456.  
We need to make a **column exchange** between 100s and 10s.

$$\begin{array}{r} \phantom{5}937 \\ \phantom{5}937 \\ - \phantom{5}937 \\ \hline \phantom{5}937 \end{array}$$

## Learning Reminders

Column subtraction of 4-digit numbers.

Now  $6390 - 1425$ .

In this example we  
have to make 2  
exchanges: 10s and 1s  
and 1000s and 100s

|                 |                |               |              |
|-----------------|----------------|---------------|--------------|
| 5000            | 1300           | 80            | 10           |
| <del>6000</del> | <del>300</del> | <del>90</del> | <del>0</del> |
| - 1000          | 400            | 20            | 5            |
| <hr/>           |                |               |              |
| 4000            | 900            | 60            | 5            |

|              |              |              |              |
|--------------|--------------|--------------|--------------|
| 5            | 13           | 8            | 10           |
| <del>6</del> | <del>3</del> | <del>9</del> | <del>0</del> |
| - 1          | 4            | 2            | 5            |
| <hr/>        |              |              |              |
| 4            | 9            | 6            | 5            |

$$4000 + 900 + 60 + 5 = 4965$$

## Practice Sheet Mild

### Column subtraction of 4-digit numbers

Use expanded or compact column subtraction to solve these subtractions.

1.  $4563 - 2327$

2.  $4563 - 2381$

3.  $4563 - 2721$

4.  $9675 - 4236$

5.  $9675 - 4283$

6.  $9675 - 4733$

7.  $5472 - 3651$

8.  $4731 - 3206$

9.  $6348 - 3402$

Choose two subtractions to check using compact column addition.

## Practice Sheet Hot

### Column subtraction of 4-digit numbers

1.  $4723 - 2518$

9.  $7145 - 3312$

2.  $8542 - 5136$

10.  $6523 - 4357$

3.  $9536 - 5252$

11.  $8414 - 4276$

4.  $7528 - 3254$

12.  $5478 - 3582$

5.  $6267 - 3423$

6.  $8564 - 4602$

7.  $9425 - 5284$

8.  $6273 - 4528$

#### Challenge

Find two 4-digit subtractions where you will need to make three column exchanges. What is an easy way to tell?

# Practice Sheets Answers

## Column subtraction of 4-digit numbers (mild)

1.  $4563 - 2327 = 2236$
2.  $4563 - 2381 = 2182$
3.  $4563 - 2721 = 1842$
4.  $9675 - 4236 = 5439$
5.  $9675 - 4283 = 5392$
6.  $9675 - 4733 = 4942$
7.  $5472 - 3651 = 1821$
8.  $4731 - 3206 = 1525$
9.  $6348 - 3402 = 2946$

## Column subtraction of 4-digit numbers (hot)

- |                         |                          |
|-------------------------|--------------------------|
| 1. $4723 - 2518 = 2205$ | 9. $7145 - 3312 = 3833$  |
| 2. $8542 - 5136 = 3406$ | 10. $6523 - 4357 = 2166$ |
| 3. $9536 - 5252 = 4284$ | 11. $8414 - 4276 = 4138$ |
| 4. $7528 - 3254 = 4274$ | 12. $5478 - 3582 = 1896$ |
| 5. $6267 - 3423 = 2844$ |                          |
| 6. $8564 - 4602 = 3962$ |                          |
| 7. $9425 - 5284 = 4141$ |                          |
| 8. $6273 - 4528 = 1745$ |                          |

### Challenge

Find two 4-digit subtractions where you will need to make three column exchanges.  
What is an easy way to tell?

e.g.  $4025 - 1578$ ,  $6320 - 5555$

In subtractions like this, the 1s, 10s and 100s digit of the number being subtracted will be greater than the corresponding digits in the larger number.

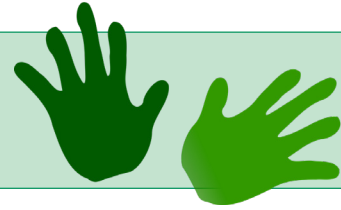
## A Bit Stuck?

### Hops and jumps

Work in pairs

#### Things you will need:

- A pencil



#### What to do:

- Take it in turns to be the teacher and to be the Frog. Choose a subtraction. Tell your partner, one step at a time, how to work out the answer to the subtraction.
- Work out as many subtractions as you can. Make sure you include at least one from each section.

#### Hop, jump

$$234 - 197$$

$$815 - 798$$

$$623 - 595$$

#### Hop, jump, hop

$$504 - 479$$

$$803 - 785$$

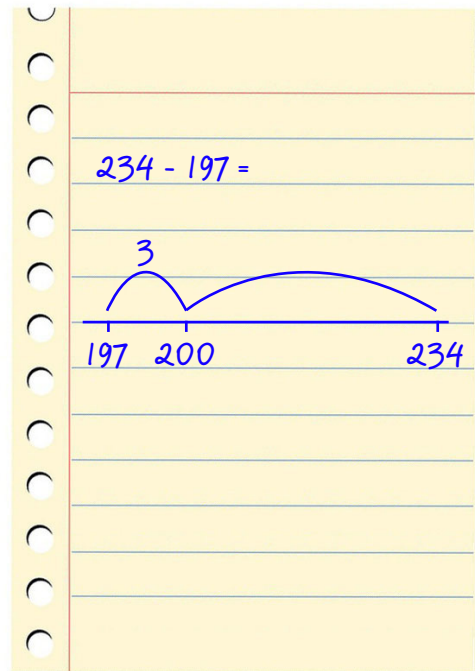
$$901 - 768$$

#### Hop, jump, jump

$$412 - 367$$

$$821 - 782$$

$$732 - 676$$



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

Choose two subtractions to check using addition.

#### Learning outcomes:

- I can use counting up (Frog) to subtract 3-digit numbers either side of a multiple of 100.
- I am beginning to use addition to check subtraction.

## Check your understanding

### Questions

Estimate the answer to each of these subtractions:

- $628 - 363$
- $772 - 538$
- $236 - 187$

Now calculate each one.

Find the difference between your estimate and the exact answer in each case.

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How many times can you subtract 2816 from 9999?

Find out by doing the subtractions.

You should have a palindromic number left!

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Use these digits to create two different 4-digit numbers:

4      1      6      8

Subtract the smaller from the larger.

Repeat this.

Will your answer always be an even number?

Justify your opinion.

## Check your understanding

### Answers

Estimate the answer to each of these subtractions:

- $628 - 363$  265. Estimating to nearest 10:  $630 - 360 = 270$  (difference of 5).
- $772 - 538$  234. Estimating to nearest 10:  $770 - 540 = 230$  (difference of 4).
- $236 - 187$  49. Estimating to nearest 10:  $240 - 190 = 50$  (difference of 1).

Now calculate each.

Find the difference between your estimate and the exact answer in each case.

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How many times can you subtract 2816 from 9999?

Find out by doing the subtractions.

You should have a palindromic number left! 3 times, leaving 1551.

$$9999 - 2816 = 7183 \quad \rightarrow 7183 - 2816 = 4367 \quad \rightarrow 4367 - 2816 = 1551$$

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Use these digits to create two different 4-digit numbers:

4      1      6      8

Subtract the smaller from the larger.

Repeat this.

Will your answer always be an even number?

Justify your opinion.

The answer will always be even unless the 1 is in the 1s place of either number, in which instance the answer will be odd.