Formal written method of column subtraction (1)

National curriculum attainment targets

- Subtract numbers with up to three digits, using the formal written method of columnar subtraction
- Estimate the answer to a calculation and use inverse operations to check

Lesson objectives

- Subtract three-digit numbers using the formal written method of column subtraction (decomposition)
- Estimate and check the answer to a calculation

Previous related lessons

None

Prerequisites for learning

Pupils need to:

- understand the place value of three-digit numbers
- recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100

Vocabulary

hundreds, tens, ones (units), subtract

Future related lessons

Unit 7, Week 2, Lesson 2; Unit 9, Week 2, Lesson 3; Unit 11, Week 2, Lesson 1; Unit 11, Week 2, Lesson 2

Success criteria

Pupils can:

- write the calculation vertically
- subtract the ones, change the ones column when needed
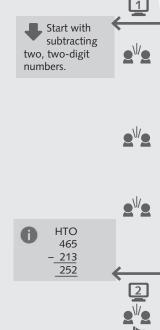- subtract the tens
- subtract the hundreds

Getting Started

- Choose an activity from Number – Addition and subtraction.
- Choose an activity from *Fluency in Number Facts: Y3/Y4* – Addition and subtraction.

> The layout for the formal column method used in this lesson will continue to be used in future lessons. If this does not fit with your Calculation Policy then adapt lessons accordingly.

Collins Connect
Year 3, Unit 7, Week 2

Teach

Resources

mini whiteboard, pen and eraser (per child)

Start with subtracting two, two-digit numbers.

- Display: Slide 1.
- Say: **We are going to learn a method for subtracting numbers that are too large to subtract mentally. This method is called the formal method for subtraction.**
- Say: **First let's estimate the answer to the calculation.** After about 20 seconds, ask the class for some estimates.
- Read the calculation together as a class, pointing to the appropriate digits as you do so.
- Point to the vertical calculation and say: **We subtract the ones from the ones, the tens from the tens and the hundreds from the hundreds.**
- Ask: **What is the ones calculation?** Establish that it is 5 subtract 3.
- Model where to write the answer. Say: **The answer to the ones calculation is written underneath the ones digits in the ones column.**
- Say: **Next we subtract the tens.**
- Ask: **What is the tens calculation?** Insist that children say 60 subtract 10 and not 6 subtract 1. Encourage the use of known subtraction facts to work out the answer.
- Model where to write the answer. Say: **The answer is written in the tens column. We know the answer is 50, and as we are writing 5 in the tens column, it means 50.**

$$\begin{array}{r} \text{HTO} \\ 465 \\ -\ 213 \\ \hline 252 \end{array}$$

- Repeat for the hundreds column. Again, insist children say 400 subtract 200 not 4 subtract 2.
- Display: Slide 2.
- Say: **Estimate the answer to this calculation.**
- Say: **Work out this calculation. Use the formal method for subtraction.**

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• Display: Slide 3.
• Ask: **What is the problem with the ones calculation in this subtraction?** Discuss 2 subtract 7 as a class. Establish that the calculation cannot be changed around to 7 subtract 2.
• Say: **To overcome this problem we use a method of subtraction called "decomposition". We change the way 582 is written.**
• Display: 582 using Base 10 or the Base 10 tool. Write HTO over the relevant sections on the whiteboard.
• Count the Base 10 together. Say: **I will still have 582, but I can just change the way it is organised. I can take one ten from the tens column and put it in the ones column.** Drag and drop a ten into the ones column.
• Say: **Now the ones have 12 so 7 can be subtracted from it.**
• Go back to the written calculation. Cross out the 8 digit. Say: **I can take 10 from the 80 and change it to 70.** Write 7 clearly above the crossed out 8.
• Say: **The ten that I take I give to the ones column. So the 2 now becomes 12, 10 and 2.** Cross out the 2 and clearly write 12 above it.
• Work through the calculation as a class.
• Display: Slide 4
• Say: **Work out this calculation. You will need to change the ones.**
• Work through the calculation as a class focusing on any aspects children find challenging.

HTO
582
– 237
345

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Individualised Learning

Refer to Activity 1 from the Learning activities on page 286.

Pupil Book 3B – Page 32: Column subtraction (1)
Progress Guide 3 – Support, Year 3, Unit 7, Week 2, Lesson 1: Subtracting 1s and 10s

Plenary

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• Display: Slide 5.
• Read the vertical calculation to the class pointing to the numbers as you do.
• Say: **I am going to show you how to work this out using the formal method so we are sure we understand the method.** Start working through the calculation.
• Children should recognise that the calculation is incorrectly written out and tell you this.
• Say: **Explain to me what is wrong with the calculation.**
• If children do not call out, keep going to the hundreds column and then say: **There seems to be a problem. I cannot do 200 subtract 400. What has happened?**
• Establish that, as subtraction calculations cannot be changed around when we write them out vertically, the first number must be written at the top. That is the number we subtract from.

Overcoming Barriers

• Children will find this method challenging if they do not have a secure understanding of the place value of three-digit numbers and instant recall of the addition and subtraction number facts to 20. Continue to focus on mental methods to develop this understanding or model the method using Base 10.