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UNIT

8 PART1

SUPPLEMENTARY TEACHING

SEQUENCES

**PURPOSE AND
PROMPTS**

This provides revision and practice of two essential skills needed for complementary addition.

This will help to move children to a method for larger numbers based on the mental method above.

UNIT 8 PART 1 SUPPLEMENTARY TEACHING SEQUENCES

SEQUENCE 1

Complementary addition

RESOURCES:

None required

STEP 1

Give the children a two-digit number and ask them for the 'next 10' (e.g. $73 \rightarrow 80$) and ask what has to be added to reach that number (7).

Repeat this with three-digit numbers (e.g. $246 \rightarrow 250$).

Encourage children to make use of known facts.

Repeat again, this time with two-digit multiples of 10. Ask the children what has to be added to reach 100 ($60 \rightarrow 100$, adding 40).

Give the children a three-digit multiple of 10 and ask them for the 'next 100' (e.g. $250 \rightarrow 300$) and then ask what has to be added to reach that number (50).

Can children make connections between $25 + 5 = 30$ and $250 + 50 = 300$?

STEP 2

If this group of children have worked on Unit 7 Supplementary Teaching Sequence 2 invite them to remind you of the three key questions they used. If not, you may wish to use part of that sequence before progressing with this one.

Q How many to the next multiple of 10?

Q How many to the largest multiple of 10?

Q How many more do we need to add on to reach the larger number?

Demonstrate a written method, using children to ask the key questions.

**PURPOSE AND
PROMPTS**

This will help children to set out subtraction.

UNIT 8 PART 1 SUPPLEMENTARY TEACHING SEQUENCES

$$\begin{array}{r} 91-37 \\ 91 \\ \underline{-37} \\ 3 \\ 50 \\ \underline{\quad 1} \\ 54 \end{array}$$

What to say to yourself:

37 → 40

40 → 90

90 → 91

Q Does the answer seem reasonable?

Extend to a three-digit number minus a two-digit number, emphasising the layout.

$$\begin{array}{r} 103-68 \\ 103 \\ \underline{-68} \\ 2 \\ 30 \\ \underline{\quad 3} \\ 35 \end{array}$$

What to say to yourself:

68 → 70

70 → 100

100 → 103

Can children total the jumps easily?**Q Does the answer seem reasonable?**

Ask the children to work out $112 - 85$ and $142 - 75$, and to check the reasonableness of their answers.

STEP 3

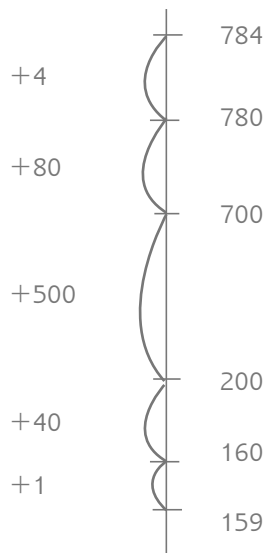
Progress to three-digit numbers (using vertical number lines). Working with the children, demonstrate $784 - 159$.

This will help to progress children to subtraction of three-digit numbers.

PURPOSE AND PROMPTS

You may need to spend longer (or even stay) on the empty number line before progressing to the written procedure.

UNIT 8 PART 1 SUPPLEMENTARY TEACHING SEQUENCES



Now we have to ask ourselves more questions:

1. How many to the next 10?
 2. How many to the next 100?
 3. How many to the 100s in the larger number?
 4. How many to the 10s in the larger number?
 5. How many 1s to the larger number?
- And, of course:
6. How many altogether?

$$\begin{array}{r}
 784 \\
 -159 \\
 \hline
 1 \\
 40 \\
 500 \\
 80 \\
 4 \\
 \hline
 625
 \end{array}$$

What to say to yourself:

- 159 → 160
- 160 → 200
- 200 → 700
- 700 → 780
- 780 → 784

Work through some more examples with children as appropriate and then ask children to carry out some calculations on their own.

Continue with practice until children are confident.

Can children record the steps logically so that they see what needs to be added to find the total difference?

STEP 4

Q Can we shorten this method?

The easiest way to shorten the calculation is to combine the last two steps, i.e. from 700 to 784. It is a little more difficult to combine the first two as this involves knowing complements in 100 (e.g. the complement of 59 is 41). Children might need to have an oral/mental

If the children are coping with the five-step approach, you can discuss completing the calculation in fewer steps.

**PURPOSE AND
PROMPTS**

This will help children identify efficient methods for different subtractions, taking account of the numbers involved.

UNIT 8 PART 1 SUPPLEMENTARY TEACHING SEQUENCES

session on these complements before you cover short methods.

Two-step and three-step procedures are illustrated below.

$\begin{array}{r} 784 \\ -159 \\ \hline 41 \end{array}$	$(159 - 200)$	$\begin{array}{r} 784 \\ -159 \\ \hline 41 \end{array}$	$(159 - 200)$
$\begin{array}{r} 584 \\ \hline 625 \end{array}$	$(200 - 784)$	$\begin{array}{r} 500 \\ \hline 84 \end{array}$	$(200 - 700)$
		$\begin{array}{r} 84 \\ \hline 625 \end{array}$	$(700 - 784)$

Q Which do you find easier?

Can children combine two stages together and explain why they can do this?

Provide some three-digit subtractions to complete, similar to those on Activity sheet 8.1 (*Springboard 5* page 97).

Remind them that if they find the shorter methods too difficult they should revert to the longer methods.

STEP 5

Write the following subtractions on the board:

1. $100 - 98$
2. $423 - 86$
3. $1003 - 999$

Q Which subtractions require a written method and which can easily be done in your head?

Explain that they should be able to do some of these calculations in their heads quite quickly (i.e. 1 and 3), whereas 2 would need to be a written method.

Provide some more subtractions and set children the task of deciding how they would find answers. The task is not to do the calculations, but to make decisions about an appropriate method. Children could then share their decisions with a partner.

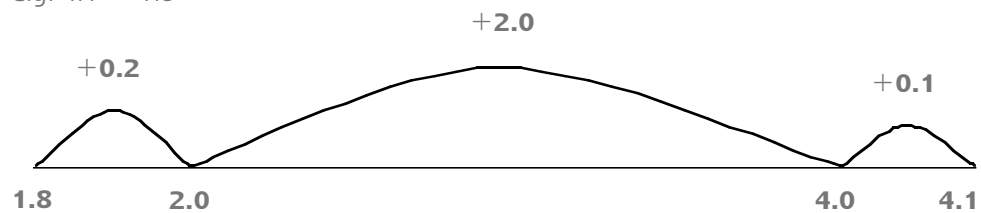
Additional notes

Using complementary addition with money and measures

The following examples utilise a horizontal empty number line. However, a vertical number line can easily be used, following on from Supplementary Teaching Sequences for Unit 7 and Unit 8 (Part 1).

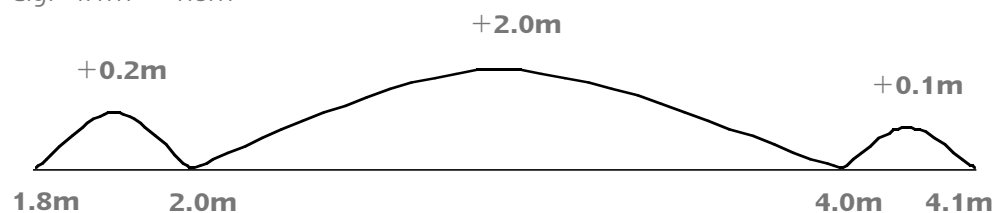
Provided that the children have a basic understanding of decimals, the empty number line method (and accompanying informal written procedure) can be extended to the subtraction of decimals. Work would need to be done on 'complements to 1' (e.g. what do you add to 0.3 to make 1?) and on the addition of decimals. For example, $6.5 - 4.7$ would entail adding 0.3 (to take us to 5) and then 1.5 (to take us to 6.5), giving an answer of $0.3 + 1.5 = 1.8$. This could then be applied to money, length, weight, etc.

e.g. $4.1 - 1.8 =$



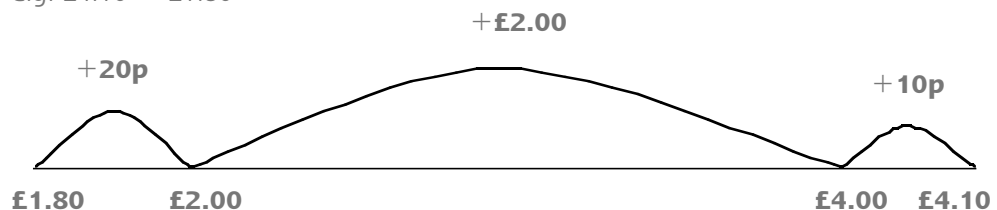
Therefore $4.1 - 1.8 = 0.2 + 2.0 + 0.1 = 2.3$

e.g. $4.1\text{m} - 1.8\text{m} =$



Answer = 2.3m

e.g. $\text{£}4.10 - \text{£}1.80 =$



Answer = £2.30

This supplementary unit addresses some aspects of the material in Days 1 and 3 of the Year 5 Unit plan: Unit 11, Addition and subtraction, Autumn term. It will enable some children to access the work in that unit.