Subtraction Prior Learning Assessment Question 7 & 8 :

Q4: I can use an efficient written method to subtract(involving exchanging)

NC : NAS 1 : add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)
NAS3: use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy

Teacher Input Ideas:

Input for exchanging (decomposition method)

Use a large place value chart template and base ten or sweets to model what exchanging is and why it is necessary. Encourage children to help you to explain ensuring that the children are using accurate vocabulary.

For example

This is how I can record formally what I am doing

```
  3  1
  9 4 6
  1 3 8
-------
  8 0 8
-------
```

I can see that I have 6 sweets, they are my ones. I want to give 8 away. I will have to open /exchange a pack of ten. I will then have ten ones and my 6 ones so I now can take 8 from the 16.

I have opened/exchanged one on my tens so I only have 3 lots of ten or 30. I have taken 30 away from this I will have zero left.

900 hundred take away 800 hundred sweets, I will have 100 hundred sweets left.

If some children are finding this difficult to understand they should use the purple activity to practically explore exchanging with 3 and 4 digit numbers.

When the children are ready, explore exchanging with 4 and 5 digit amounts and explore examples where we need to subtract from a zero. Also encourage children to approximate what the answer will be first to help them to check that their working out is accurate.

8909 – 3458

Th	h	t	o
	8	1	
8	~~9~~	0	9
3	4	5	8
5	4	5	1

I can see that I have 9 ones. I want to give 8 away. So 9 – 8 = 1

I want to take 5 tens (or 50) away from no tens. I will have to open/ exchange some of my hundreds into tens. 10 tens – 5 tens = 5

I have opened/exchanged one on my hundreds so I have 8 lots of hundred(800) . 8 hundreds – 4 hundreds = 4 hundreds .

8 thousands – 3 thousands = 5 thousands

8029 – 6781

Th	h	t	o
7	~~1~~ 9	1	
8	~~0~~	~~2~~	9
6	7	8	1
1	2	4	8

I can see that I have 9 ones. I want to give 1 away. So 9 – 1 = 8

I want to take 8 tens (or 80) away from 2 tens. I will have to open/ exchange some of my hundreds into tens. There are no hundreds to exchange. So I will have to use my thousands and exchange these into hundreds and then exchange one of those hundreds into tens. (you may want to show this visually too)

I now have the 12 tens (120) and I want to take away 8 tens (80) = 4 tens or 40.

I now have 9 hundreds and I want to take 7 hundreds away so I have 2 hundreds.

I have 7 thousands as I exchanged one of these for hundreds. 7 thousands – 6 thousands = 1 thousand,

Practice Activities

Purple Practice: Most suited for children who demonstrated no attempt to exchange in question 7 and 8 of the prior learning assessment.

This is a practical activity using the purple resources 1, 2 and 3 (3 could be replaced with Base Ten or sweets grouped).

Resource 1 is a grid with columns for ones, tens, hundreds and thousands. Some children may find it beneficial to start with exchanging with only 3 or 4 digits first to understand what it is and why it is needed. Provide the children with sums suggested below. Encourage the children to use the grid by placing the amounts needed into each column, using either objects or the visual representation on resource page 3.

Practically explore subtracting amounts from each column. Discuss what happens when we haven't got enough in that column to take some away. Encourage the children to suggest using some from the next column and exchanging these onto tens or ones. The could cut these up/ open sweets to see how this works. Now can we take the amount away? On another place value chart, an adult could model how this can be presented using the formal method alongside what the children are doing.

Resources 2 includes a ten thousand column for when the children are ready to subtract from 5 digit amounts.

Suggested questions:

349 – 187

891 – 384

450- 228

702 – 565

1891- 538

2653- 1497

8167- 6459

9760- 2568

Green Practice: Most suited for children that made errors in Question 7 and 8 of the prior assessment and will benefit from securing the use of the formal subtraction method including exchanging

Children are presented with 9 sums laid out ready to use the written formal subtraction method. These questions require the children to exchange tens , hundreds and thousands to work out what the answer is. The questions get progressively harder, including sums where the children need to subtract from zero.

For a further challenge, you could ask the children to check how reliable their estimation was, and spot any errors they may have made when working out. Additionally the children can apply place value skills such as writing the value of the digits and order the values. For question one, they could attempt to write the sum and answer in Roman numerals.

Yellow Practice: Most suited for children who demonstrated some understanding in Question 7 and 8 of the prior learning assessment.

This activity provides the opportunity to practise using the decomposition method to work out sums where children will need to exchange amounts.

Additionally, a few questions have been placed in the task to test the children's efficiency. Q2, Q6 and Q7 can be performed mentally and a written method is not required. If the children have used a written method for all questions, prompt them to return to the task and find the questions that could have been performed mentally (fluency and efficiency).

Some children may demonstrate difficulty on questions 5 and 9 as they must exchange when a zero is used as a place holder.

Mastery: reasoning and fluency

The children are provided with a task where they are required to apply their rounding skills to approximate the answer to a sum. The children are then required to apply a written subtraction strategy to calculate the answer which requires exchanging and subtracting from a zero. The children should also be encouraged to explain why Safa has the closest estimation. Encourage the children to think about which estimation they found quickest and what they would round the amounts to when approximating.

Answers

Purple:

349 – 187 = 162 891 – 384= 507 450- 228 = 22

702 – 565 = 137 1891- 538 = 1353. 2653- 1497 = 1156

8167- 6459 = 1708. 9760- 2568 = 7192

Green:

1) 1911 2) 10286 3) 7874

4) 6908 5) 25573 6)22673

7) 66540 8) 14551 9) 30355

Yellow :

1) 53564 2) 12649 3) 570

4) 788709 5) 707109 6) 90,000

7) 810 8) 65240 9) 8879

10) 357409 11) 65874

Mastery:

1) 40,000 – 20,000 = 20,000

   35,000 – 24, 000 = 11,000

   35100 – 23600 = 11,500

2) 1 1 5 1 4
3) Children should be able to explain that Safa was the closest in her estimation and be able to explain why rounding to the nearest hundred gives an more accurate estimation that rounding to the nearest ten thousand. You may also want children to discuss if they were able to estimate quickly when rounding to the nearest hundred. How would they have rounded if they were estimating? Why?

BRICKWORK Mathematics

Purple Practice

Practical Resource 1

ones	
tens	
hundreds	
thousands	

BRICKWORK Mathematics

Purple Practice

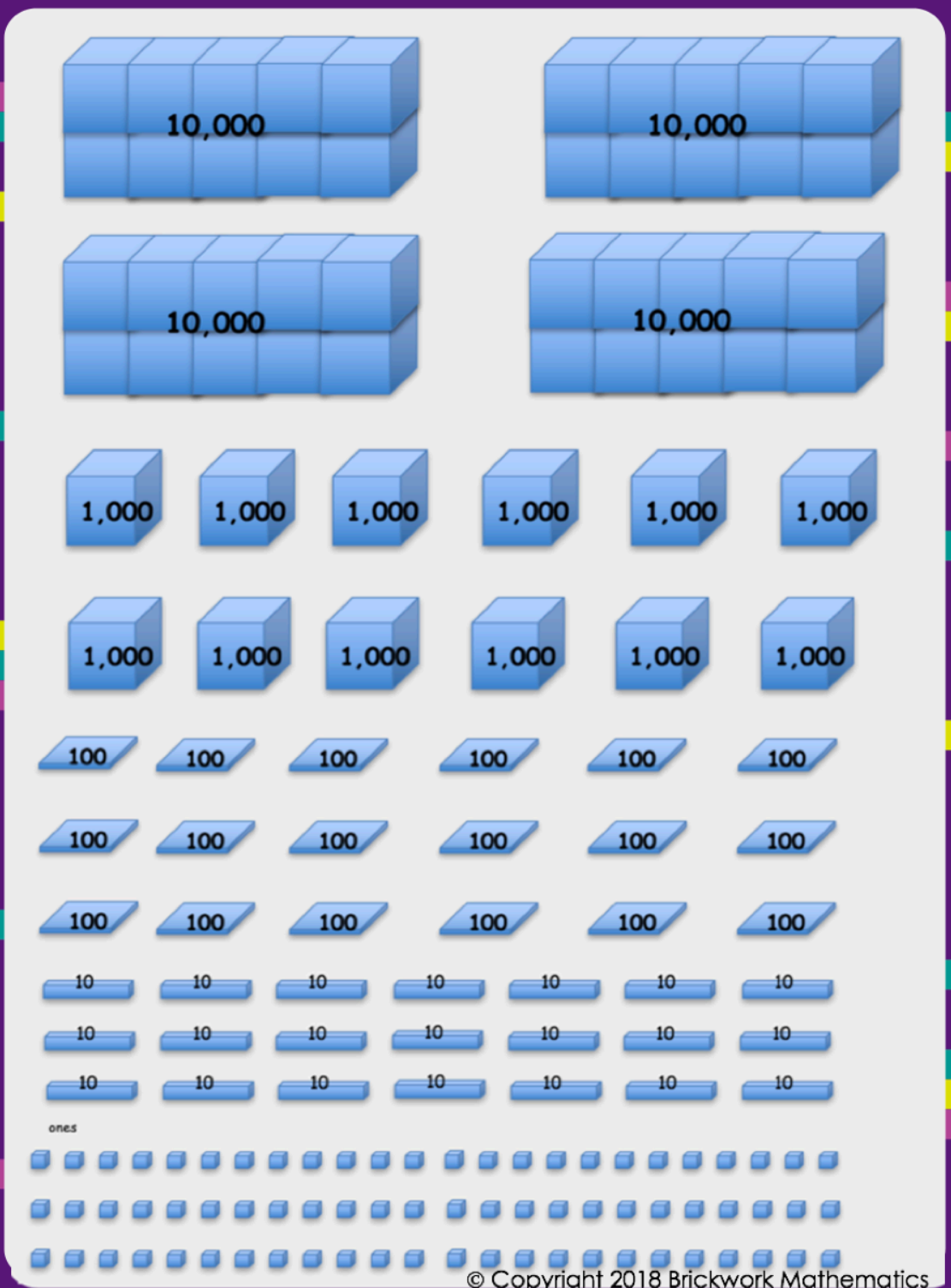
Practical Resource 2

ones	
tens	
hundreds	
thousands	
tens of thousands	

BRICKWORK Mathematics

Purple Practice

Practical Resource 3



BRICKWORK Mathematics

Green Activity

LO: I can use a formal written method to subtract (including exchanging).

Look at each question and use a written method. Estimate what the answer will be first to help you check your answer is accurate.

1)
$$\begin{array}{r} 4367 \\ -\ 2456 \\ \hline \\ \hline \end{array}$$

2)
$$\begin{array}{r} 12685 \\ -\ 2399 \\ \hline \\ \hline \end{array}$$

3)
$$\begin{array}{r} 24354 \\ -\ 16480 \\ \hline \\ \hline \end{array}$$

4)
$$\begin{array}{r} 35267 \\ -\ 28359 \\ \hline \\ \hline \end{array}$$

5)
$$\begin{array}{r} 30946 \\ -\ 5373 \\ \hline \\ \hline \end{array}$$

6)
$$\begin{array}{r} 89681 \\ -\ 67008 \\ \hline \\ \hline \end{array}$$

7)
$$\begin{array}{r} 70804 \\ -\ 4264 \\ \hline \\ \hline \end{array}$$

8)
$$\begin{array}{r} 28047 \\ -\ 13496 \\ \hline \\ \hline \end{array}$$

9)
$$\begin{array}{r} 69003 \\ -\ 38648 \\ \hline \\ \hline \end{array}$$

BRICKWORK Mathematics

Yellow Practice

Lo: I can use a formal written method for subtraction (including exchanging)

Look at the sums below. Decide how you are going to work these out and write the answers in the box provided.

1) 128827- 75263 =

2) 12848-199 =

3) 12910 – 12340 =

4) 909278 – 120569 =

5) 720019- 12910 =

6) 91837- 1837 =

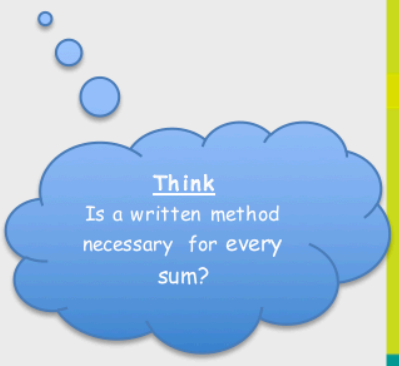
7) 829-19 =

8) 73638- 8398 =

9) 38002- 29123 =

10)982731 – 625322 =

11) 72873- 6999 =



BRICKWORK Mathematics

Mastery

Fluency and Reasoning

Three children are given this sum to calculate:

35092 - 23578

Each child estimates the answer first.

Harry rounds his to the nearest ten thousand.

Zara rounds the amounts to the nearest thousand.

Safa rounds the amounts to the nearest hundred.

1) Work out their approximations:

2) Work out what the actual answer is.

3) Who is the closest in their estimation? Why do you think this is?