Journal problem 1: Numbers bigger than one hundred

Introduction:

This activity introduces numbers between 100 and 200. Students make each number by adding on one more MAB and adding one with the calculator. They draw the block onto the picture provided and write the numeral on the block. The aim is for students to make connections between numbers 101-200 and those that they already know between 1 and 100. Complete Blast activity A1 before beginning this journal problem.

You will need: Substantial supplies of MAB and calculators for this activity. One way to accommodate this is by completing the activity in 'rotational groups' time.

Leading questions:

- If we started at zero and added one, what would the number be? So if we start at 100 and add one, what do you think this number might be?
- How are the MAB for 101 similar to the MAB for 1?
- How is the numeral for 101 similar to the numeral for 1? What patterns can you find?
- If still stuck, tell them the name is **one hundred and** one. Ask them which part of the name refers to the big block (100) and which part refers to the small block (1), then proceed below.
- How are the MAB/numerals/names for 101 similar to 102? What patterns can you find? Have student predict the next number (103) and explain why they predicted this.

Misconceptions to watch out for:

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- Students who don't understand place value for three columns (e.g. instead of writing 101 they write 1001). If one student does this then check to make sure that it is not a problem for other students.
- Students who think that they should count: 98, 99, 100, 200, 300...

Teaching Tips:

- Support students: Consolidate the concept of tens and ones before introducing hundreds. Use bundling sticks, MAB and other physical materials to consolidate this understanding. You should also be able to fit the MAB onto the picture and trace around each one. Watch that the students complete a whole row before moving on. Swap each row for a ten as it is completed.
- Make 101 as a class joint activity. Build up one by one until you have noticeable patterns.
- Use pictures of the blocks to put on the board so that students can remember the different ways and associate names with pictures and symbols.
- The manipulation problem involves regrouping. This is repeated in Problem 5 because the process is vital for understanding how numbers work (e.g. in operations). Make sure that students focus on making the 200 blocks altogether. They should check by aligning them on the page.

PROBLEM 1: NUMBERS BIGGER THAN ONE HUNDRED

Your job is to try and work out what numbers bigger than one hundred look like. Start with one 'hundreds' MAB and then follow the instructions. Answer the questions as you go.

One more than one hundred:



This picture shows a 'hundred' block.

Write the numeral for one hundred:



Type one hundred into your calculator. Add one to your number. What did you get? Ⅲ

How do you think you would make this number out of MAB? Which blocks would you use?

What do you think the name of this number might be?

2. Ten more than one hundred:

Type one hundred into your calculator again. Keep adding one on until the middle digit changes. How many ones did you need to add?

Write the number that you ended up with:

What do you think the name of this number might be?

Could you swap the ones that you added for another type of block? Explain your answer:

3. Twenty more than one hundred:

Keep adding one on until the middle digit changes to a two. How many ones did you need to add?

Write the number that you ended up with:

What do you think the name of this number might be?

Could you swap the ones that you added for another type of block? Explain your answer:

Teacher initials:

Date:

Problem solving / T&R:

o Problem solved with minimal or

- non-mathematical prompting o Some leading questions were used
- Solved after explanation
 Did not work out solution
- N/A- not a novel problem

Reasoning / Comm.:

(verbal, written, working and equations, or visual representations)

- o Clearly and logically reasoned
- o Easily understood o Understood with some
- interpretation needed
- o Some gaps but on topic o Minimal or off topic

Understanding / Reflect:

- o Found lots of patterns and ways to make 200
- Found some patterns and a few
- ways to make 200
 Made 200 appropriately but tended not to follow a pattern
- Had a few problems making 200 in different ways
- o Did not make 200 appropriately
- o Student not observed

One hundred more than one hundred:

| Ι | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----|----|----|----|----|----|----|----|----|-----|
| | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
| 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 | 29 | 30 |
| 31 | 32 | 33 | 34 | 35 | 36 | 37 | 38 | 39 | 40 |
| 41 | 42 | 43 | 44 | 45 | 46 | 47 | 48 | 49 | 50 |
| 51 | 52 | 53 | 54 | 55 | 56 | 57 | 58 | 59 | 60 |
| 61 | 62 | 63 | 64 | 65 | 66 | 67 | 68 | 69 | 70 |
| 71 | 72 | 73 | 74 | 75 | 76 | 77 | 78 | 79 | 80 |
| 81 | 82 | 83 | 84 | 85 | 86 | 87 | 88 | 89 | 90 |
| 91 | 92 | 93 | 94 | 95 | 96 | 97 | 98 | 99 | 100 |
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■ Start at one hundred again. Keep adding one on until the front digit changes to a two. As you add each one, draw the blocks that you added underneath this hundreds block and write the numeral on the block. The first one has been done for you.

- How many ones did you need to add?
- 2. Write the number that you ended up with:
- 3. What do you think the name of this number might be?

4. Is there a block that you think you could swap all these ones and tens for? Explain your answer:

When the numbers between 1 and 100 similar to the numbers between 101 and 200?

Explain what MAB you could use to make 200:

Manipulation problem:

How could you make 200 using different MAB? Find as many ways as you can to make 200 out of ones, tens and hundreds MAB. Draw the blocks on a separate piece of paper and record them using a place-value chart.