

Sample Assessment: Grade 5

Task Description

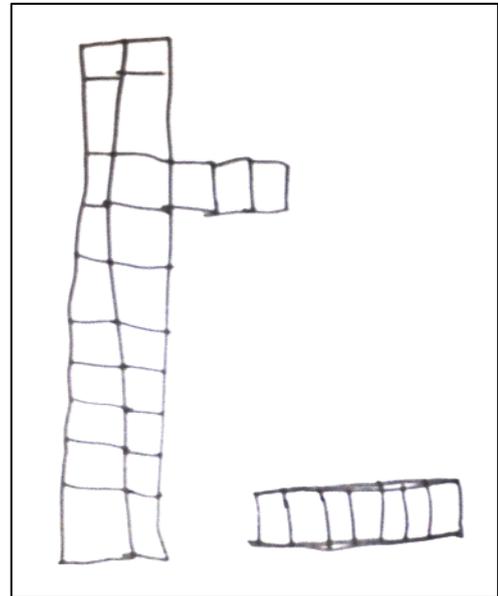
Students were asked to make 23.7 using base 10 blocks, then to consider how many different ways there would be to make 23.7 if they had "tenth" blocks.

Student 1: Ethan

Ethan **initially** used 2 tens blocks, 3 ones blocks then left a space and added another 7 ones blocks to represent 7 tenths.

Teacher used questioning such as:

- If we push all of the blocks back together do we still have 23.7?
- If there are 30 blocks when it is pushed together, can it still be 23.7 when it is separated?
- Is 23 bigger or smaller than 23.7? Is 24 bigger or smaller than 23.7? So what does that tell us?

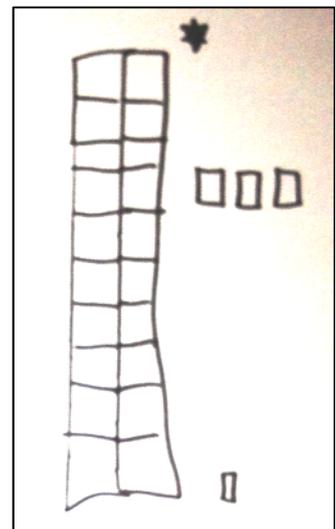


From these questions Ethan decided that his initial attempt would make 30 blocks, not 23.7.

Ethan's **second attempt** shows the growth in his thinking. He now uses part of one block to represent the 7 tenths. However, the part of the block was described by him as "about a half". He did not divide one block into ten pieces and use seven of these. He also did not use a ruler to mark 0.7mm on the 1cm block.

After this the teacher focused questions on the base-ten system as follows:

- How many ones are in one ten block? (10)
- How many tens are in one hundred block? (10)
- How many hundreds are in one thousand block? (10), and the reverse:
- How would we cut a thousand block to make a hundred block? (cut in 10)
- How would we cut a hundred block to make a ten block? (cut in 10)
- How would we cut a ten block to make a one block? (cut in 10)
- So... how would we make the part after the decimal point using the one block?



Following these questions, Ethan decided to cut the one block into 10 pieces and use 7 of these pieces. Ethan was then given the next question: If you actually had these little tenth pieces, how many different ways could you make 23.7 using tens, ones and tenths blocks?

Ethan's extension task:

Once he had worked out the base ten pattern from the initial problem, Ethan had no difficulties extending this pattern to find variations for how to make 23.7. He showed a self-correction. He was easily able to explain the pattern that he used, and demonstrated adding each number together to prove that it was 23.7: "1 ten is 10, then add on 8 ones makes 18. Then we have 57 tenths, which is the same as 5.7. So that makes 23.7."

Ethan Davidson

T	O	t
2	3	7
2	2	17
2	1	27
2	0	37
1	9	47
1	8	57
1	7	67

More students in the class:

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T	O	t
2	3	7
2	2	17
2	1	27
2	0	37
1	3	47
1	2	57
1	1	67
0	23	17
0	24	6

T	O	t
2	3	7
0	23	7
2	2	17
2	1	27
2	0	37
1	9	47
1	8	57
1	7	67
1	6	77
1	5	87
1	4	97
1	3	107
1	2	117
1	1	127
1	0	137

DOM

T	O	t
1	13	7
2	1	20
2	0	40