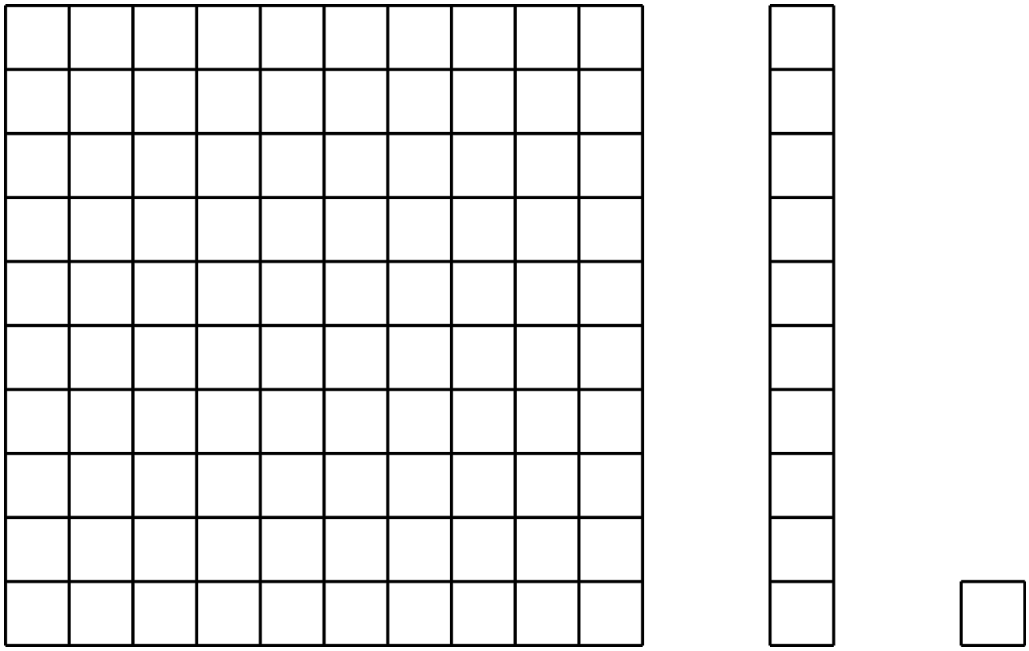
L2: #1



1. How could you represent the large square as a power of 10? Explain.
2. If each small square represents 10^2, then what does the medium rectangle represent? The large square?
3. If the medium rectangle represents 10^5, then what does the large square represent? The small square?
4. If the large square represents 10^{100}, then what does the medium rectangle represent? The small square?

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L2: #2 Let's explore patterns in exponents when multiplying powers of 10.

1. Complete the table. You may skip a single box in the table, but if you do, be prepared to explain why you skipped it.

expression	expanded	single power of 10
$10^2 \cdot 10^3$	$(10 \cdot 10)(10 \cdot 10 \cdot 10)$	10^5
$10^4 \cdot 10^3$		
$10^4 \cdot 10^4$		
	$(10 \cdot 10 \cdot 10)(10 \cdot 10 \cdot 10 \cdot 10 \cdot 10)$	
$10^{18} \cdot 10^{23}$		

2. Use the patterns you found in the table to rewrite $10^n \cdot 10^m$ as an equivalent expression with a single exponent.

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L2 #3

1. Use your rule to write $10^4 \times 10^0$ with a single exponent. What does this tell you about the value of 10^0?
2. The state of Georgia has roughly 10^7 human residents. Each human has roughly 10^{13} bacteria cells in his or her digestive tract. How many bacteria cells are there in the digestive tracts of all the humans in Georgia? Make your thinking visible.

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L2: #4

There are four ways to make 10^4 by multiplying smaller, positive powers of 10.

$$10^1 \cdot 10^1 \cdot 10^1 \cdot 10^1$$

$$10^1 \cdot 10^1 \cdot 10^2$$

$$10^1 \cdot 10^3$$

$$10^2 \cdot 10^2$$

(This list is complete if you don't pay attention to the order you write them in. For example, we are only counting $10^3 \times 10^1$ and $10^1 \times 10^3$ once.)

1. How many ways are there to make 10^5 by multiplying smaller powers of 10 together?
2. How many ways are there to make 10^6 in the same way?
3. What about 10^7?

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