

Taking a closer look

315
x 25


**An inquiry into
multiplication
and grouping**



THE
Math Dogs

Taking a closer look

$$\begin{array}{r} 315 \\ \times 25 \\ \hline \end{array}$$

A magnifying glass with a brown handle and a white lens is positioned over a list of multiplication problems. The lens is focused on the list, making the text inside it larger and clearer than the text outside. The background of the page is white with faint, light gray mathematical symbols like stars, circles, and lines scattered around.
$$\begin{array}{l} 300 \times 20 \\ 10 \times 20 \\ 5 \times 20 \\ 15 \times 5 \\ 300 \times 5 \end{array}$$

Teachers:

Use this example as needed. Some students may need this prompting, others can inquire and manipulate the numbers to come to their own understanding of multiplying multiple digit numbers.

Inquiry Questions

1. How can you break down a large multiplication problem into smaller, more manageable parts? (partitioning)
2. What strategies can you use to estimate the product of two large numbers without actually multiplying them?
3. Can you think of a real-world scenario where you might need to add or multiply large numbers? How could you simplify the problem to make it easier to solve?
4. How do you decide whether it's better to use mental math, paper and pencil, or a calculator for a particular multiplication or addition problem?
5. What are some shortcuts or tricks you can use to mentally multiply numbers by multiples of 10, 100, or 1000?
6. Can you come up with a fun and creative way to teach your classmates a strategy for adding or multiplying large numbers?

Write down some of your thoughts or sketch some of your ideas below!


Then, in your inquiry journal answer some 3-4 of these questions and provide examples/images.




Taking a closer look

Take a closer look at the questions below:

Can we apply the same type of grouping strategies to multiplication? Remember- you can't use the standard algorithm inside the magnifying glass!


$$\begin{array}{r} 205 \\ \times 30 \\ \hline \end{array}$$



$$\begin{array}{r} 1,240 \\ \times 40 \\ \hline \end{array}$$

Taking a closer look

Take a closer look at the questions below:

How can we use our knowledge of place value, partitioning, and grouping to break these problems down in the simplest way! You cannot use the standard algorithm- you need to be creative!


$$\begin{array}{r} 380 \\ \times 21 \\ \hline \end{array}$$


$$\begin{array}{r} 12,200 \\ \times 14 \\ \hline \end{array}$$

Taking a closer look

Now, write some of your own problems (multiplication) in the small boxes.

After, in the magnifying glass, show your strategy to break problem into a more manageable problem.



Taking a closer look

Now, write some of your own problems (multiplication) in the small boxes.

After, in the magnifying glass, show your strategy to break problem into a more manageable problem.



Did you have to change your original problems?
Why or why not? Does your strategy of breaking
down numbers always make calculation easier? Are
there times when the standard algorithm is better?