Unit 9, Lesson 5

Multiplication of Multi-digit Numbers

Let's multiply multi-digit numbers.

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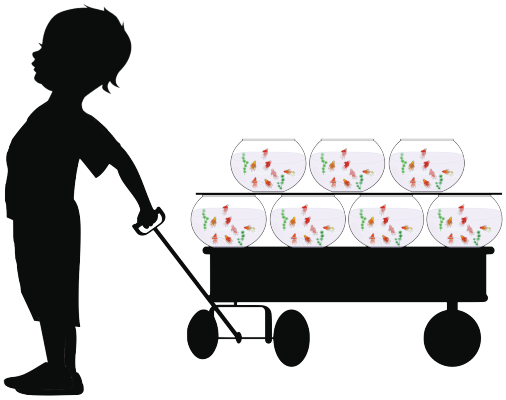
Warm-up

Estimation Exploration: A Silly Riddle

- Seven teachers go to the park.
- Each teacher takes 7 students.
- Each student brings 7 fishbowls.
- Each fishbowl has 7 fish.



How many go to the park?

Record an estimate that is:

too low	about right	too high

Activity 1

Two Methods Revisited

1. We used 2 different ways to multiply numbers earlier in the school year.

A

$$\begin{array}{r} 4\ 1\ 6 \\ \times \quad\ \ 2 \\ \hline 1\ 2 \\ 2\ 0\ \ \\ +\ 8\ 0\ 0 \\ \hline 8\ 3\ 2 \end{array}$$

B

$$\begin{array}{r} 1\ \ \ \\ 4\ 1\ 6 \\ \times \quad\ \ 2 \\ \hline 8\ 3\ 2 \end{array}$$

a. In Method A, where do the 12, 20, and 800 come from?

b. In Method B, where does the 1 above 416 come from?

2. Diego uses both methods to find the value of 215×3. He has a different result for each method.

$$\begin{array}{r} 2\ 1\ 5 \\ \times \quad\ \ 3 \\ \hline 1\ 5 \\ 3\ 0\ \ \\ +\ 6\ 0\ 0 \\ \hline 6\ 4\ 5 \end{array}$$

$$\begin{array}{r} 2\ 1\ 5 \\ \times \quad\ \ 3 \\ \hline 6,\ 3\ 1\ 5 \end{array}$$

a. Can you tell which method shows the correct product, without using calculations? How do you know the other product is not correct?

b. For the incorrect result, explain what is correct and what is incorrect in Diego's steps. Then show the correct calculation, using Method B.

3. Use either method to find the value of each product. Show your reasoning.

   a. 521×3

   b. $6{,}121 \times 4$

   c. 305×9

Activity 2

Two by Two

Here are 2 ways to find the value of 34×21.

A

$$\begin{array}{r} 34 \\ \times\ 21 \\ \hline 1 \\ 4 \\ 30 \\ 80 \\ +\ 600 \\ \hline 714 \end{array}$$

B

$$\begin{array}{r} 34 \\ \times\ 21 \\ \hline 1 \\ 34 \\ +\ 680 \\ \hline 714 \end{array}$$

1. In Method A, where do the 4, 30, 80, and 600 come from?

2. In Method B, which 2 numbers are multiplied to get these products.

   a. 34

   b. 680

3. Use the 2 methods to show that each equation is true.

a. $44 \times 12 = 528$

$$\begin{array}{r} 44 \\ \times \quad 12 \\ \hline \square \\ \square \\ \square \\ + \quad \square \\ \hline 528 \end{array} \qquad \begin{array}{r} 44 \\ \times \quad 12 \\ \hline \square \\ + \quad \square \\ \hline 528 \end{array}$$

b. $63 \times 21 = 1{,}323$

$$\begin{array}{r} 63 \\ \times \quad 21 \\ \hline \square \\ \square \\ \square \\ + \quad \square \\ \hline 1{,}323 \end{array} \qquad \begin{array}{r} 63 \\ \times \quad 21 \\ \hline \square \\ + \quad \square \\ \hline 1{,}323 \end{array}$$