

Lesson 5: Standard Algorithm: Multi-digit Numbers without Composing

- Let's use the standard algorithm to multiply two-digit numbers and three-digit numbers.

Warm-up: Number Talk: Partial Products

Find the value of each product mentally.

- 20×3

- 24×3

- 120×3

- 140×3

5.1: Compare Two Algorithms

Two algorithms for finding the value of 413×21 are shown.

$$\begin{array}{r}
 413 \\
 \times 21 \\
 \hline
 3 \text{ step 1} \\
 10 \text{ step 2} \\
 400 \text{ step 3} \\
 60 \text{ step 4} \\
 200 \text{ step 5} \\
 + 8,000 \text{ step 6} \\
 \hline
 8,673 \text{ step 7}
 \end{array}$$

step 1

$$\begin{array}{r}
 413 \\
 \times 21 \\
 \hline
 3
 \end{array}$$

step 2

$$\begin{array}{r}
 413 \\
 \times 21 \\
 \hline
 13
 \end{array}$$

step 3

$$\begin{array}{r}
 413 \\
 \times 21 \\
 \hline
 413
 \end{array}$$

step 4

$$\begin{array}{r}
 413 \\
 \times 21 \\
 \hline
 413 \\
 60
 \end{array}$$

step 5

$$\begin{array}{r}
 413 \\
 \times 21 \\
 \hline
 413 \\
 260
 \end{array}$$

step 6

$$\begin{array}{r}
 413 \\
 \times 21 \\
 \hline
 413 \\
 8,260
 \end{array}$$

step 7

$$\begin{array}{r}
 413 \\
 \times 21 \\
 \hline
 413 \\
 + 8,260 \\
 \hline
 8,673
 \end{array}$$

1. How are the two algorithms the same? How are they different?
2. Explain or show where you see each step from the first algorithm in the second algorithm.
3. How do the final steps in the two algorithms compare?

5.2: Use the Standard Algorithm

Use the standard algorithm to find the value of each expression.

1. 202×12

2. 122×33

3. 321×24

4. Diego found the value of 301×24 . Here is his work.
Why doesn't Diego's answer make sense?

$$\begin{array}{r}
 301 \\
 \times 24 \\
 \hline
 1,204 \\
 + 602 \\
 \hline
 1,806
 \end{array}$$