Unit 6, Lesson 11

Partial Products and the Standard Algorithm

Let's compare multiplication algorithms.

Warm-up

Number Talk: The Value of the Digits

Find the value of each expression mentally.

- 5×101
- 5×102
- 5×203
- 5×404

Activity 1

Two Algorithms to Multiply

1. Here are two algorithms for finding the value of 3×713.

Kiran

$$\begin{array}{r} 7\ 1\ 3 \\ \times \quad\quad 3 \\ \hline 2,\ 1\ 3\ 9 \end{array}$$

Diego

$$\begin{array}{r} 7\ 1\ 3 \\ \times \quad\quad 3 \\ \hline \quad\quad 9 \\ \quad\ 3\ 0 \\ +\ 2,\ 1\ 0\ 0 \\ \hline 2,\ 1\ 3\ 9 \end{array}$$

Discuss with your partner:

a. How are these algorithms alike? How are they different?

b. How do you think Kiran found the product 2,139?

2. Find the value of each product.

- 212×4
- $3 \times 4{,}132$

Activity 2

Algorithm Comparison

1. Analyze the two algorithms used to find the value of 4×223.

Kiran

$$\begin{array}{r} {\scriptstyle 1} \\ 223 \\ \times\ \ 4 \\ \hline 892 \end{array}$$

Diego

$$\begin{array}{r} 223 \\ \times\ \ 4 \\ \hline 12 \\ 80 \\ +\ 800 \\ \hline 892 \end{array}$$

a. How are these algorithms alike? How are they different?

b. Where is the 12 in Kiran's algorithm?

2. a. Try using Kiran's algorithm to find the value of 512×3.

b. Check your work using a different method.