



# 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.

- $5 \times 101$

- $5 \times 102$

- $5 \times 203$

- $5 \times 404$



## Activity 1

### Two Algorithms to Multiply

1. Here are two algorithms for finding the value of  $3 \times 713$ .

**Kiran**

$$\begin{array}{r} 713 \\ \times 3 \\ \hline 2,139 \end{array}$$

**Diego**

$$\begin{array}{r} 713 \\ \times 3 \\ \hline 9 \\ 30 \\ + 2,100 \\ \hline 2,139 \end{array}$$

Discuss with your partner:

- How are these algorithms alike? How are they different?
- How do you think Kiran found the product 2,139?

2. Find the value of each product.

◦  $212 \times 4$

◦  $3 \times 4,132$

## Activity 2

### Algorithm Comparison

1. Analyze the two algorithms used to find the value of  $4 \times 223$ .

**Kiran**

$$\begin{array}{r} \phantom{\times} \phantom{2} \phantom{2} \phantom{3} \phantom{4} \\ \phantom{\times} \phantom{2} \phantom{2} \phantom{3} \phantom{4} \\ \times \phantom{2} \phantom{2} \phantom{3} \phantom{4} \\ \hline 8 \phantom{9} \phantom{2} \end{array}$$

**Diego**

$$\begin{array}{r} \phantom{\times} \phantom{2} \phantom{2} \phantom{3} \phantom{4} \\ \phantom{\times} \phantom{2} \phantom{2} \phantom{3} \phantom{4} \\ \times \phantom{2} \phantom{2} \phantom{3} \phantom{4} \\ \hline \phantom{2} \phantom{2} \phantom{3} \phantom{4} \\ \phantom{2} \phantom{2} \phantom{3} \phantom{4} \\ + \phantom{2} \phantom{2} \phantom{3} \phantom{4} \\ \hline 8 \phantom{9} \phantom{2} \end{array}$$

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

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

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

- b. Check your work using a different method.

