## Lesson 9: Recording Partial Products: One-digit and Three- or Four-digit Factors

* Let’s analyze and try an algorithm that uses partial products.

### Warm-up: Which One Doesn’t Belong: Expressions Galore

Which one doesn’t belong?

1. $7×50$
2. $\left(3×50\right)+\left(4×50\right)$
3. $\left(5×10\right)×7$
4. $50+50+50+50+50+50+50$

### 9.1: An Algorithm for Noah

1. Noah drew a diagram and wrote expressions to show his thinking as he multiplied two numbers.
* 
* $7×124$
$7×\left(100+20+4\right)$
$\left(7×100\right)+\left(7×20\right)+\left(7×4\right)$
$700+140+28$
* How does each expression represent Noah’s diagram? Be prepared to share your thinking with a partner.
1. Later, Noah learned another way to record the multiplication, as shown here.
* Step 1
* Step 2
* Step 3
* Make sense of each step of the calculations and record your thoughts. Be prepared to explain Noah’s steps to a partner.
1. Complete the diagram to find the value of $217×8$. Use Noah’s recording method to check your work.
* 
* 

### 9.2: Try an Algorithm with Partial Products

Noah and Mai want to find the value of $8×3,​419$. They recorded their steps in different ways, as shown.

Noah

Mai

1. How are Mai’s and Noah’s notation alike? How are they different?
2. Use a diagram to show what each of the partial products 72, 80, 3,200 and 24,000 represent. Then, find the value of $8×3,​419$.
3. Find the value of each expression. For at least one expression, use the algorithm that Noah used. Show your reasoning.
	1. $4×5,​342$
	2. $7×983$



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