

Name \_\_\_\_\_

## Multiply Using the Distributive Property

**Essential Question** How can you use the Distributive Property to multiply a 2-digit number by a 1-digit number?



Number and Operations in Base Ten—4.NBT.B.5

**MATHEMATICAL PRACTICES**  
MP1, MP7



### Investigate

**Materials** ■ color pencils, grid paper

You can use the Distributive Property to break apart numbers to make them easier to multiply.

The **Distributive Property** states that multiplying a sum by a number is the same as multiplying each addend by the number and then adding the products.

- Outline a rectangle on the grid to model  $6 \times 13$ .
- Think of 13 as  $5 + 8$ . Break apart the model to show  $6 \times (5 + 8)$ . Label and shade the smaller rectangles. Use two different colors.

Use the Distributive Property. Find the product each smaller rectangle represents. Then find the sum of the products. Record your answers.

\_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

\_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

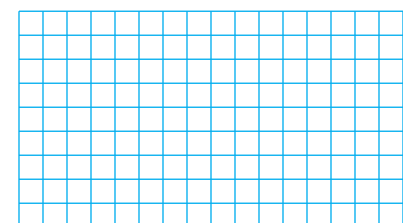
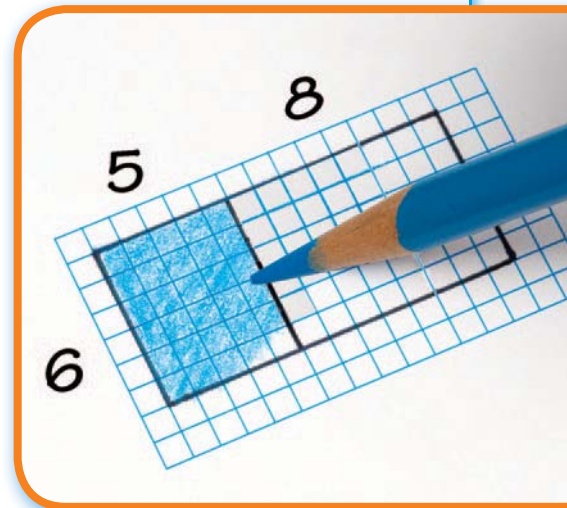
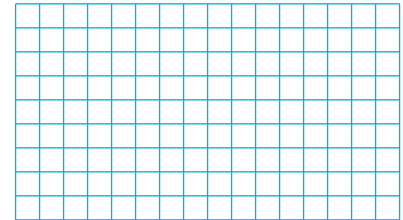
\_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_

- Model  $6 \times 13$  again. Think of 13 as a different sum. Break apart the model to show  $6 \times (\text{_____} + \text{_____})$ . Find the product each smaller rectangle represents. Then find the sum of the products. Record your answers.

\_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

\_\_\_\_\_  $\times$  \_\_\_\_\_ = \_\_\_\_\_

\_\_\_\_\_ + \_\_\_\_\_ = \_\_\_\_\_



## Draw Conclusions

1. Explain how you found the total number of squares in each model in Steps B and C.

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2. Compare the sums of the products in Steps B and C with those of your classmates. What can you conclude?

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3. **THINK SMARTER** To find  $7 \times 23$ , is it easier to break apart the factor, 23, as  $20 + 3$  or  $15 + 8$ ? Explain.

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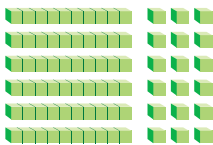
## Make Connections



Another way to model the problem is to use base-ten blocks to show tens and ones.

### STEP 1

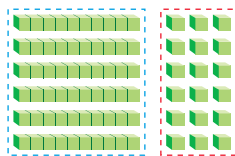
Use base-ten blocks to model  $6 \times 13$ .



6 rows of 1 ten 3 ones

### STEP 2

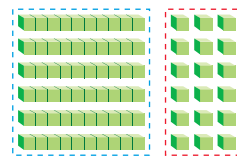
Break the model into tens and ones.



$(6 \times 1 \text{ ten})$        $(6 \times 3 \text{ ones})$   
 $(6 \times 10)$              $(6 \times 3)$

### STEP 3

Add the tens and the ones to find the product.



$(6 \times 10) + (6 \times 3)$   
 60      +      18

So,  $6 \times 13 = 78$ .

In Step 2, the model is broken into two parts. Each part shows a **partial product**. The partial products are 60 and 18.

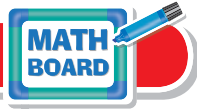
**Math Talk**

**MATHEMATICAL PRACTICES 4**

**Model Mathematics** Why is this a good model for the problem?

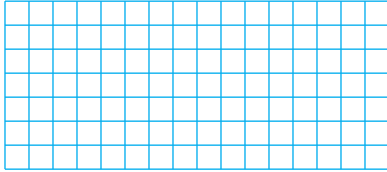
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## Share and Show

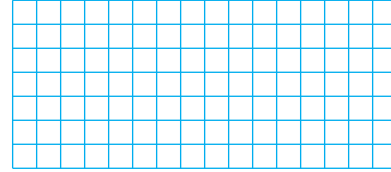


Model the product on the grid. Record the product.

1.  $3 \times 13 =$  \_\_\_\_\_

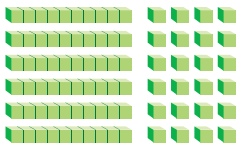


2.  $5 \times 14 =$  \_\_\_\_\_

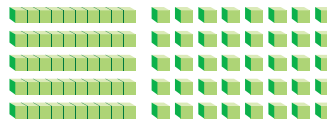


Find the product.

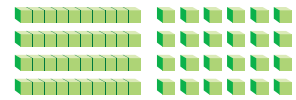
3.  $6 \times 14 =$  \_\_\_\_\_



4.  $5 \times 18 =$  \_\_\_\_\_



5.  $4 \times 16 =$  \_\_\_\_\_



Use grid paper or base-ten blocks to model the product.  
Then record the product.

6.  $7 \times 12 =$  \_\_\_\_\_

7.  $5 \times 16 =$  \_\_\_\_\_

8.  $9 \times 13 =$  \_\_\_\_\_

## Problem Solving • Applications



9. **MATHEMATICAL PRACTICE 6** Explain how modeling partial products can be used to find the products of greater numbers.

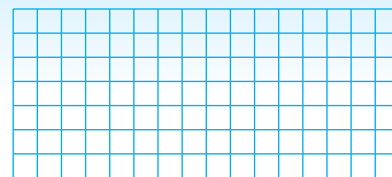
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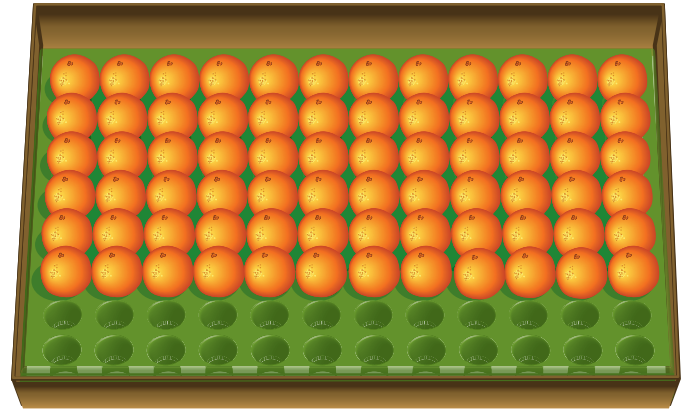
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10. **THINK SMARTER** Use the Distributive Property to model the product on the grid. Record the product.

$4 \times 14 =$  \_\_\_\_\_



11. **THINK SMARTER** Kyle went to a fruit market. The market sells a wide variety of fruits and vegetables. The picture at the right shows a display of oranges.



Write a problem that can be solved using the picture.

### Pose a problem.

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### Solve your problem.

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- **GO DEEPER** Describe how you could change the problem by changing the number of rows of oranges and the number of empty spaces in the picture. Then solve the problem.

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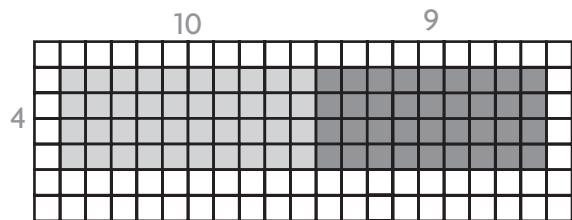
### Multiply Using the Distributive Property



**COMMON CORE STANDARD—4.NBT.B.5**  
Use place value understanding and properties of operations to perform multi-digit arithmetic.

Model the product on the grid. Record the product.

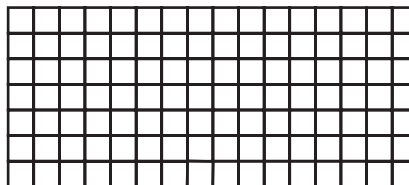
1.  $4 \times 19 = \underline{76}$



$4 \times 10 = 40$  and  $4 \times 9 = 36$

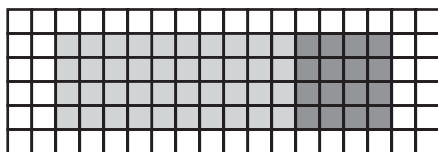
$40 + 36 = 76$

2.  $5 \times 13 = \underline{\quad}$

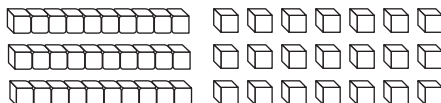


Find the product.

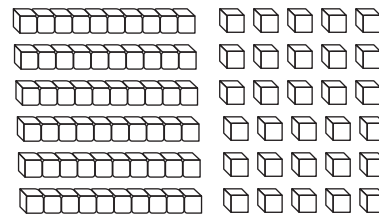
3.  $4 \times 14 = \underline{\quad}$



4.  $3 \times 17 = \underline{\quad}$



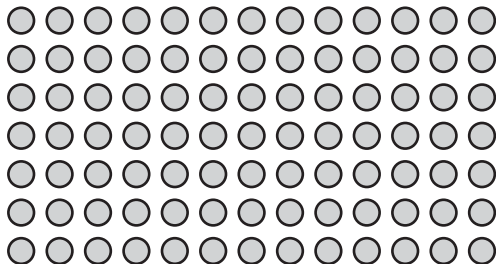
5.  $6 \times 15 = \underline{\quad}$



### Problem Solving



6. Michael arranged his pennies in the following display.



How many pennies does Michael have in all?

\_\_\_\_\_

7. **WRITE** *Math* Explain how you can use a model to find  $6 \times 17$ .

\_\_\_\_\_

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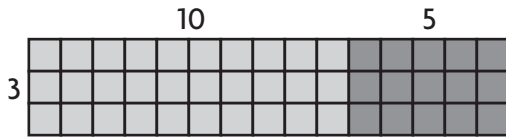
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## Lesson Check (4.NBT.B.5)

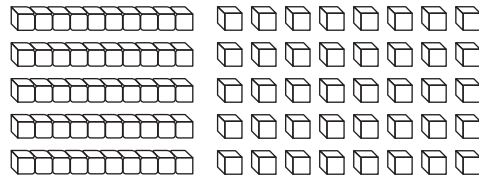
1. The model shows how Maya planted flowers in her garden.



How many flowers did Maya plant?

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2. The model below represents the expression  $5 \times 18$ .



How many tens will there be in the final product?

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## Spiral Review (4.OA.A.2, 4.NBT.A.2, 4.NBT.B.4, 4.NBT.B.5)

3. Center City has a population of twenty one thousand, seventy people. Write the population in standard form.
4. Central School collected 12,516 pounds of newspaper to recycle. Eastland School collected 12,615 pounds of newspapers. How many more pounds of newspaper did Eastland School collect than Central School?
5. Allison has 5 times as many baseball cards as football cards. In all, she has 120 baseball and football cards. How many baseball cards does Allison have?
6. A ruby-throated hummingbird beats its wings about 53 times each second. About how many times does a ruby-throated hummingbird beat its wings in 5 seconds?

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