Number and Multiplication Concepts

Factors, Multiples, and Primes

✓ **Self-Check: Questions 1–2**

Try Questions 1 and 2 to check your progress.

1. Which numbers are multiples of 3? Show or tell how you know.

A. 21   **B.** 19   **C.** 99

2. Joe Smart thinks 1, 2, 3, 5, and 7 are all factors of 35. Do you agree with Joe? Why or why not?

How did you do? Use Questions 1 and 2 to help you choose what problems to work on.

| Workshop Menu		
▲ **Working On It!**	● **Getting It!**	■ **Got It!**
I could use some extra help. *Lee Yah*	I just need some more practice. *Roberto*	I'm ready for a challenge. *Michael*
Can I find factors and multiples?	**Questions 3–7, 11**	**Questions 4–8, 11**	**Questions 7–11**

3. John said, "This flash card is for
3 × 10 = 30. It tells me that:

- 3 and 10 are **factors** of 30; and
- 30 is a **multiple** of 3 and 10.

John
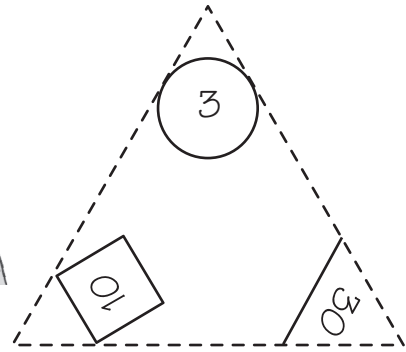
A. Find another flash card that shows two more factors of 30. Write a multiplication fact for this card.

_____

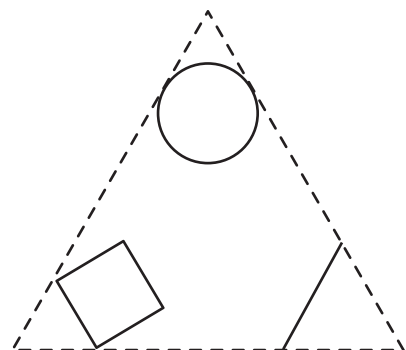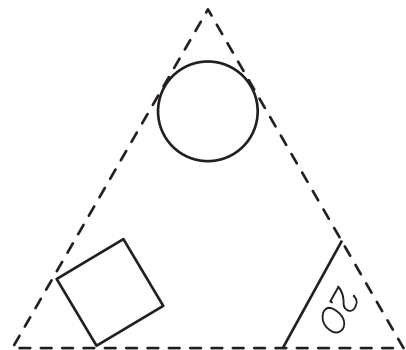**B.** Copy the numbers into the card to the right.
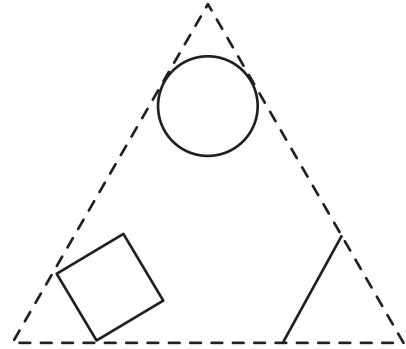
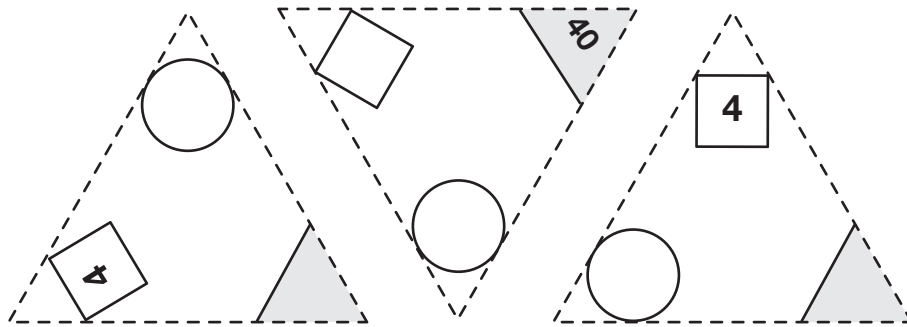**C.** Use the two cards to list four factors of 30.

_____

D. Find two flash cards that show factors of 20. Copy the numbers onto the cards at the right.

E. Write a multiplication fact for each card.

_____

_____

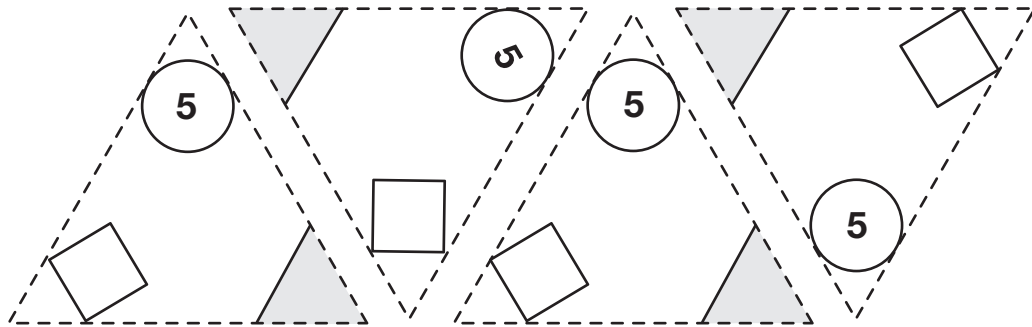**F.** Use the cards to list 4 factors of 20.

_____

G. Find three cards that show 4 as factor. Fill in the cards below to match.

Use the cards to list three multiples of 4.

_____

Write a multiplication number sentence for each card.

_____   _____   _____

H. Find four cards that show 5 as a factor. Fill in the cards to match.

Write a multiplication number sentence for each card.

_____   _____

_____   _____

Use the cards to list four multiples of 5.

_____

Name _____   Date _____

▲● □ **4.** Use the multiplication *Facts I Know* chart to look for factors and multiples.

A. Linda started to shade the multiples of 5. Help her finish and list them.

0, 5, 10, _____

_____

B. Shade and list multiples of 4.

_____

_____

C. What numbers on the chart are multiples of 4 and 5?

_____

×	0	1	2	③	4	5	6	7	8	9	10
0	0	0	0	0	0	0	0	0	0	0	0
1	0	1	2	3	4	5	6	7	8	9	10
2	0	2	4	6	8	10	12	14	16	18	20
3	0	3	6	9	12	15	18	21	24	27	30
4	0	4	8	12	16	20	24	28	32	36	40
5	0	5	10	15	20	25	30	35	40	45	50
⑥	0	6	12	18	24	30	36	42	48	54	60
7	0	7	14	21	28	35	42	49	56	63	70
8	0	8	16	24	32	40	48	56	64	72	80
9	0	9	18	27	36	45	54	63	72	81	90
10	0	10	20	30	40	50	60	70	80	90	100

**D.** Is 64 a multiple of 8? Show or tell how you know.

_____

E. Is 31 a multiple of 5? Show or tell how you know.

_____

F. Name two multiples of 5 that are also multiples of 10.

_____

G. Linda decided that 6 and 3 were factors of 18. She found 18 on the chart. Then she circled 6 and 3. Find 18 in a different place on the chart. Circle two other factors of 18. List these factors.

_____

**H.** Find 12 on the chart in two different places. Circle and list four factors of 12.

_____

▲●□ 5. A. Skip count to name the multiples of 5. Mark the multiples of 5 on this number line.

0   10   20   30
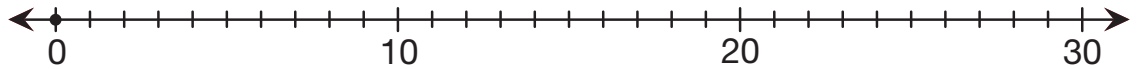
B. Is 5 a factor of all the numbers you marked? How do you know?
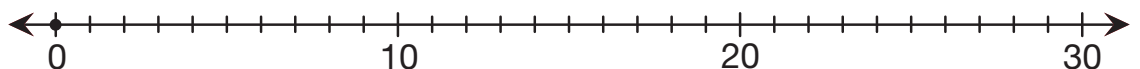
C. Is 22 a multiple of 5? How do you know?

▲●□ 6. A. Maya wanted to find the factors of 15. She started to skip count by 2 on the number line. Finish marking and labeling the multiples of 2.
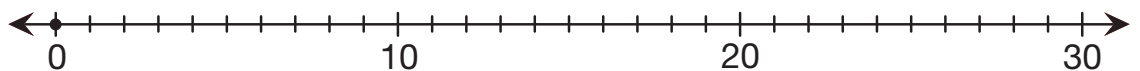

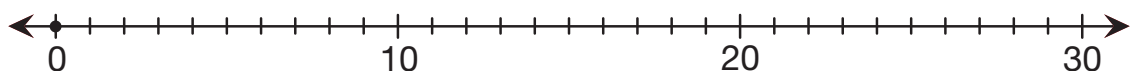0   2   4   15
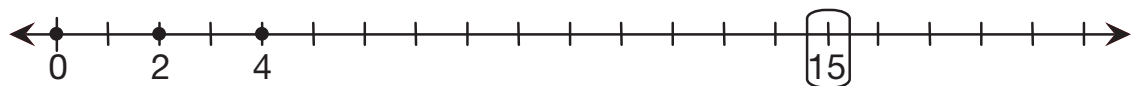
B. Is 2 a factor of 15? How do you know?

C. Use Maya's strategy to decide if 3 is a factor of 15.

0   10   20   30

D. Use Maya's strategy to decide if 4 is a factor of 15.

0   10   20   30

E. Use Maya's strategy to find if 5 is a factor of 15.
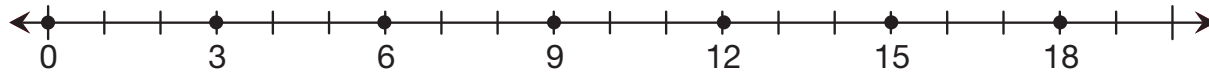

0   10   20   30

Maya created the number lines below to show multiples. Use her number lines to answer Questions 7–8 on the next page.
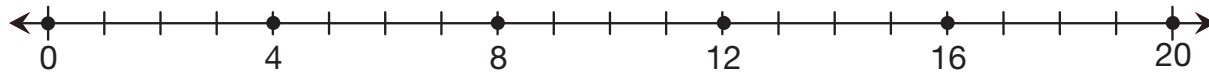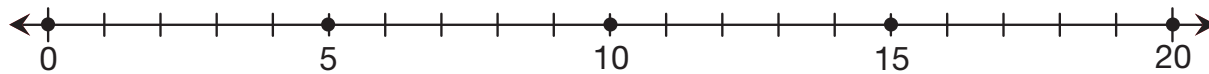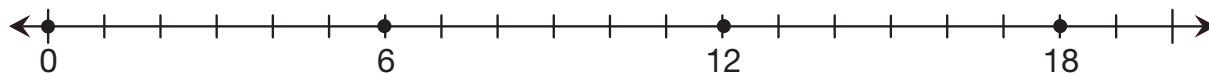
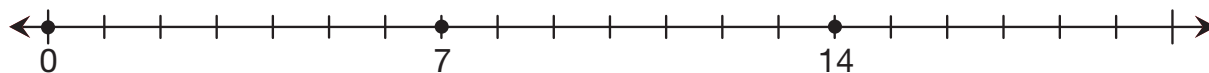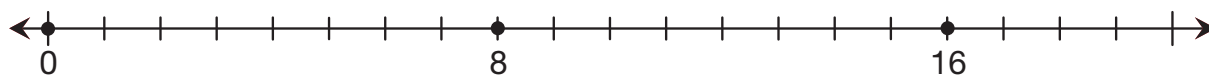Multiples of 2
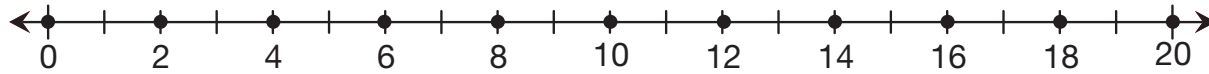
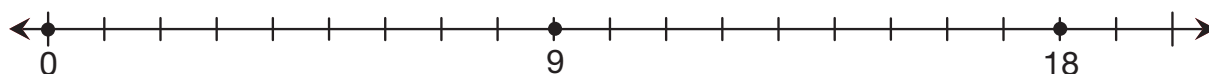
Multiples of 3

Multiples of 4
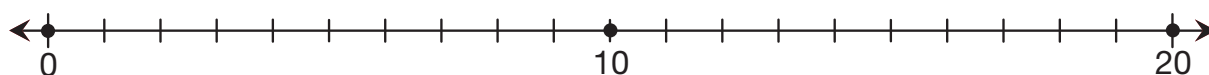

Multiples of 5

Multiples of 6

Multiples of 7

Multiples of 8

Multiples of 9

Multiples of 10

▲●■ **7.** **A.** Use Maya's number lines to list the multiples of 3 from 0 to 20.

B. Sixteen is a multiple of two. What other numbers have 16 as a multiple?

C. Twenty is a multiple of what numbers?

D. Twelve is a multiple of what numbers?

▢●■ **8.** Maya decided that 1, 3, and 9 are factors of 9.

> I land on 9 when I count by 1s, 3s, and 9s.

Maya

Use Maya's strategy to find and list the factors of the following numbers.
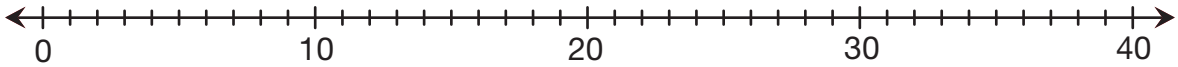
A. 18

B. 4

C. 7

Name _____   Date _____

9. **A.** Finish writing the squares of these numbers on the lines below them.

1	2	3	4	5	6
1		9			

Mark the square numbers on this number line.

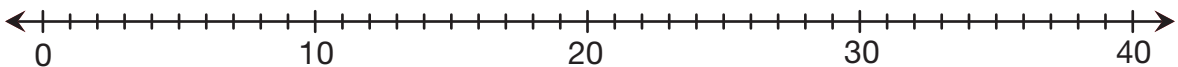0 ——— 10 ——— 20 ——— 30 ——— 40

B. Find and label the distance from each square number to the next one.

C. Is there a pattern? If yes, describe the pattern.

D. Can you use the pattern to help you predict the distance to the next square number after 36? Explain and check your prediction.

10. **A.** What are the prime numbers up to 40? Show them on this number line.

0 ——— 10 ——— 20 ——— 30 ——— 40

B. Is there a pattern? If yes, describe the pattern.

C. Can the pattern help you predict the next prime number? Explain and check your prediction.

▲●■ **11.** Remember, a **prime number** is any number greater than one that has only two factors—itself and one.

- Tell if each number below is prime.
- Use the definition to show or tell how you know. You may use rectangles or number lines in your explanations as well as numbers and words.

A. 17

B. 39

C. 51

Multiplication and Division with Rectangles
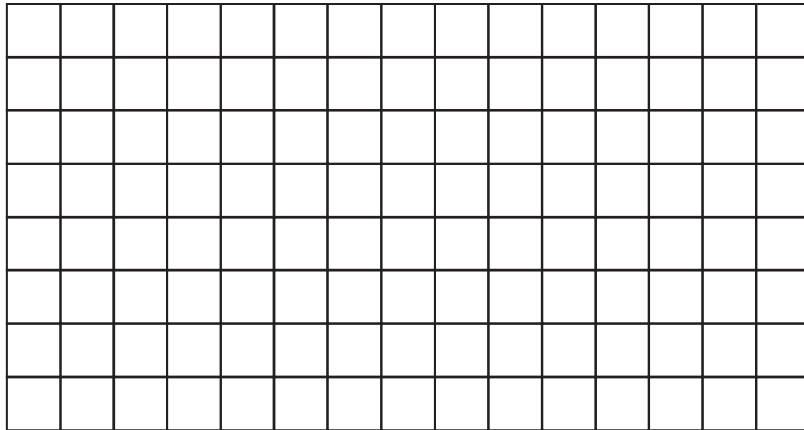
✓ **Self-Check: Questions 12–13**

Try Questions 12 and 13 to check your progress.

12. Linda is playing the Floor Tiler game. She spins 7 and 6. Draw a rectangle to find the product of 7 and 6. Show or tell your strategy.

13. Michael is playing the Floor Tiler game. He spins 9 and 4. He decides to draw a rectangle with 3 rows. How many squares will be in each row? Draw the rectangle. Write a related number sentence.
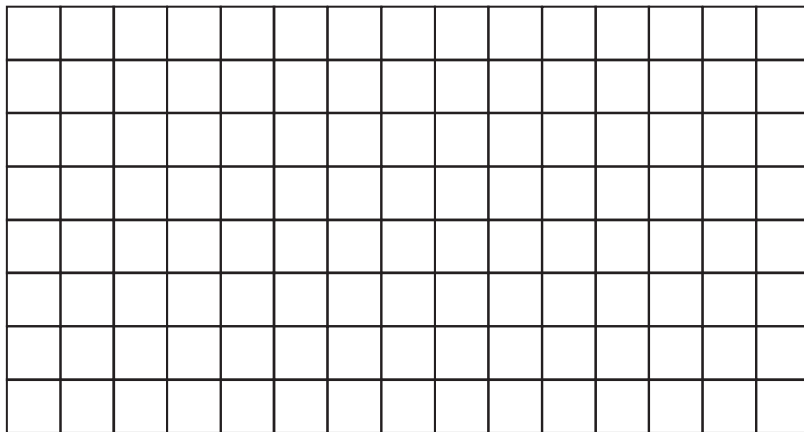
How did you do? Use Questions 12 and 13 to help you choose what problems to work on.

Workshop Menu		
▲ **Working On It!**	● **Getting It!**	■ **Got It!**
I could use some extra help. *Michael*	I just need some more practice. *Roberto*	I'm ready for a challenge. *Lee Yah*
Can I use rectangles to multiply and divide?	**Questions 14–16**	**Questions 15–18**	**Questions 16–19**

■□□ **14.** Shannon also spins 9 and 4. She decides to draw a rectangle with 6 rows. How many squares will be in each row? Draw the rectangle. Write a related number sentence.
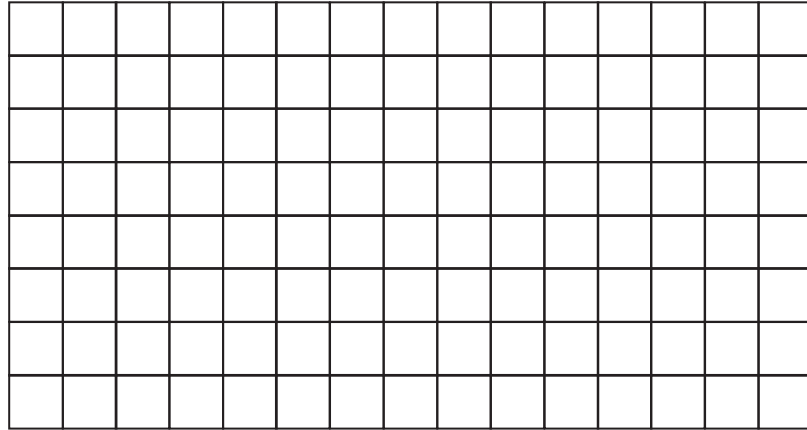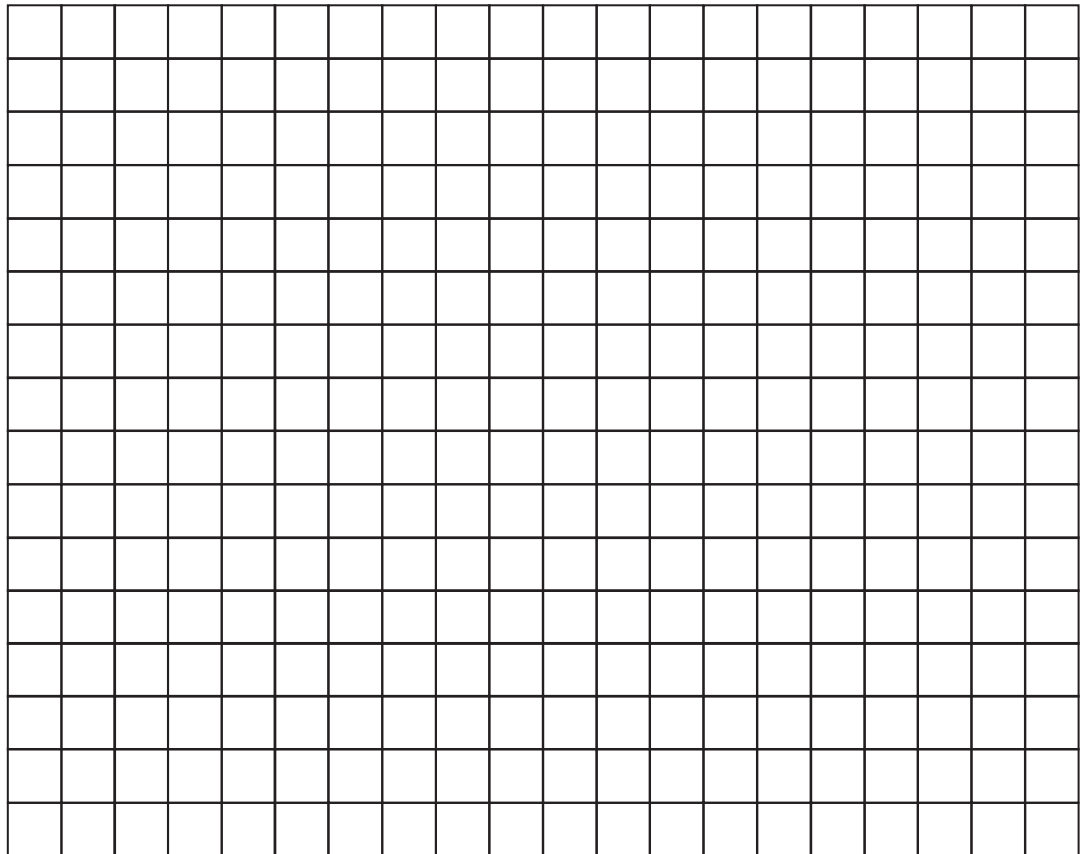
■●□ **15.** Draw rectangles on the grid to solve each of the problems. Write a related number sentence.

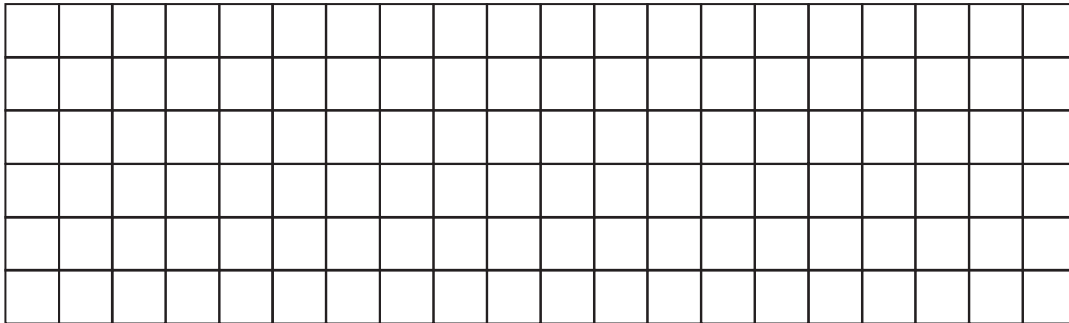**A.** 3×8 **B.** 5×9 **C.** $36 \div 4$ **D.** $18 \div 6$
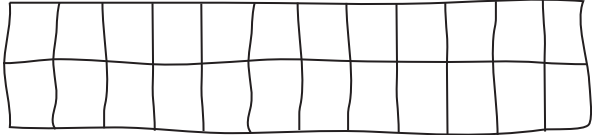
Name _____ Date _____

▲|●|■ 16. Ming spins 8 and 4. He decides to draw a rectangle with 2 rows. How many squares will be in each row? Draw the rectangle. Write a related number sentence.

□|●|□ 17. Mr. Dewey is laying a rectangular patio using 24 square tiles. What are all the rectangles he can make with 24 square tiles? He organizes his work in a table. Help Mr. Dewey complete the table.

Number of Rows	Tiles in each row	Sketch
2	12	

Workshop: Factors, Multiples, and Primes

■●■ **18.** Design a box for the TIMS Candy Company that will hold 36 pieces of candy and has more than two layers. Each layer must have the same number of pieces. Tell how many layers are in your box. Also, tell how many pieces of candy are in each layer. Show or tell how you solved this problem.

■■■ **19.** Help the Sunny Fruit Company design a rectangular-shaped box for shipping four dozen oranges. (How many oranges are in four dozen?) How many layers will your box have, how many rows of oranges will be in each layer, and how many oranges will be in each row? Show or tell how you solved this problem. (There is more than one correct solution.)

Break-Apart Products

Try Questions 20 and 21 to check your progress.

20. Solve 3 × 12 by breaking apart 12 into tens and ones. Write the related number sentences.

21. Solve 5 × 15 by breaking apart 15 into tens and ones. Write the related number sentences.

How did you do? Use Questions 20 and 21 to help you choose what problems to work on.

| Workshop Menu		
▲ **Working On It!**	● **Getting It!**	■ **Got It!**
I could use some extra help. Lee Yah	I just need some more practice. Roberto	I'm ready for a challenge. Michael
Can I use the break-apart strategy to multiply?		
Questions 22–25	Questions 23–26	Questions 25–27

▲☐☐ **22.** Mrs. Dewey's class was trying to solve 6 × 4 using the break-apart method. Below are several strategies students started.

   • Write number sentences for each part.

   • Write a number sentence to show how to find the total number of squares in the large rectangle.
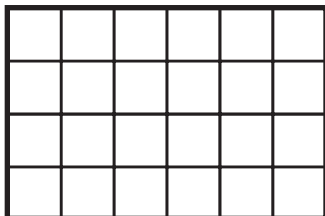
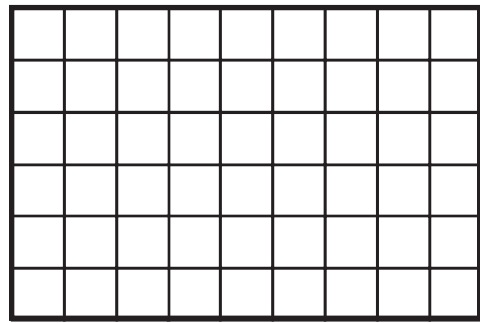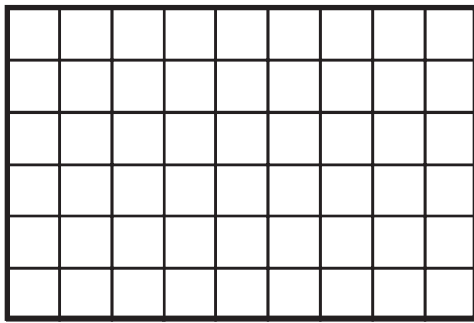**A.** Frank drew the rectangle below. Write the related number sentences to solve 6 × 4:
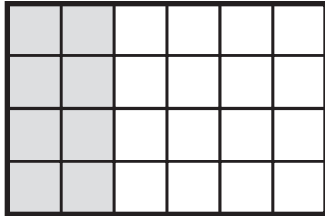
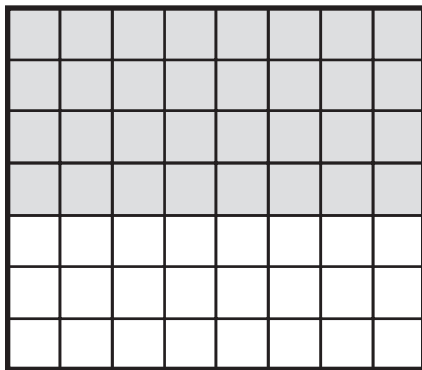**B.** Tanya broke apart the rectangle differently. Write the related number sentences.
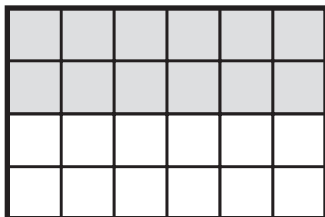
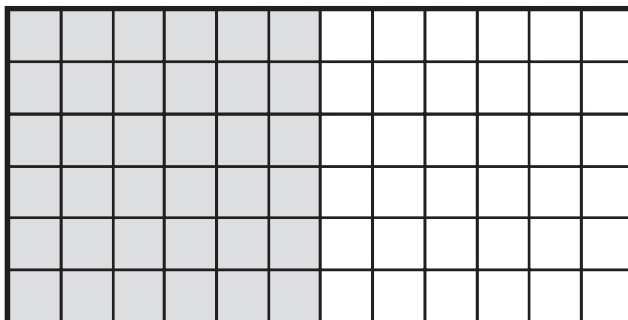**C.** Find another way to break apart the rectangle. Write the related number sentences.

▲●▢ **23.** Show two ways to solve 6 × 9 using the break-apart strategy. Write the related number sentences.
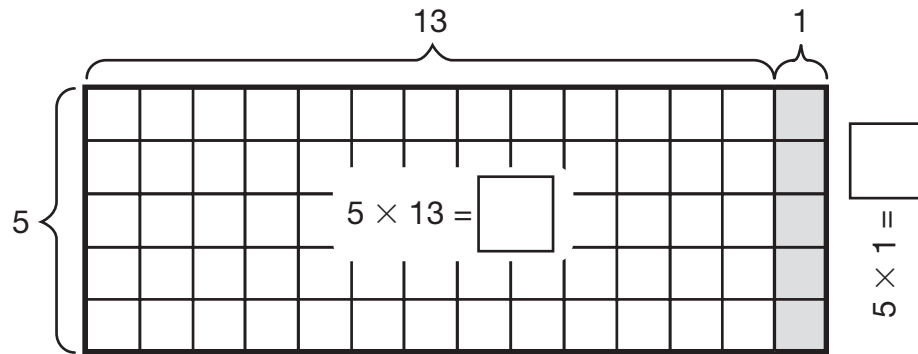

▲●▢ **24.** Linda drew the following rectangle to solve 7 × 8. Finish her solution and write the related number sentence.

▲●■ **25.** Luis drew the following rectangle to solve 6 × 12. Finish his solution and write the related number sentence.
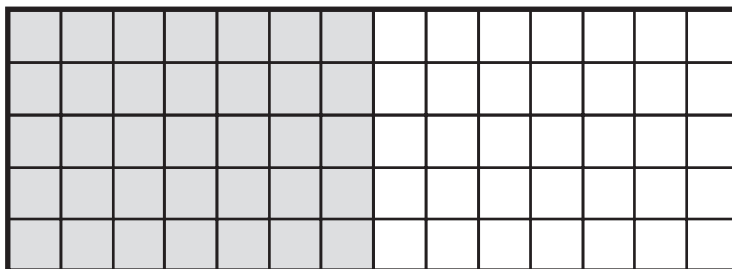
26. **A.** Ming drew the rectangle below to solve 5 × 14 using the break-apart method. Finish Ming's number sentences.
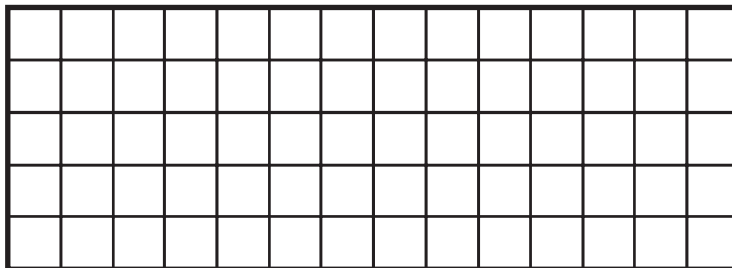
13   1

5 { | 5 × 13 = [ ] | 5 × 1 =

5 × 14 = _____ + _____ = _____

What do you think about Ming's solution?

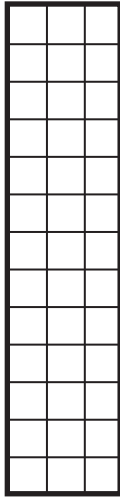**B.** Ming broke apart the rectangle a different way. Write the related number sentences.

C. Solve 5 × 14 by breaking apart 14 into tens and ones. Write the related number sentences.
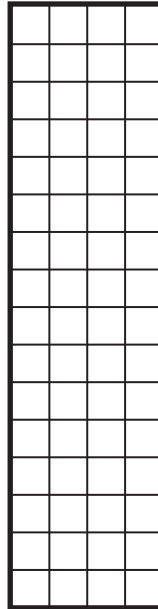
Name _____ Date _____

■ **27.** Solve the following problems using the break-apart method. Use the
rectangles below to show your solution. Write the related number
sentences.

A. 13×3 **B.** 16×4 **C.** 23×6