Name _____

Solve

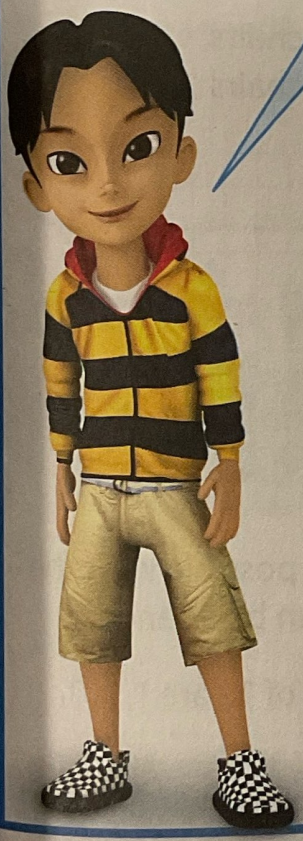
Lesson 7-1
Understand Factors

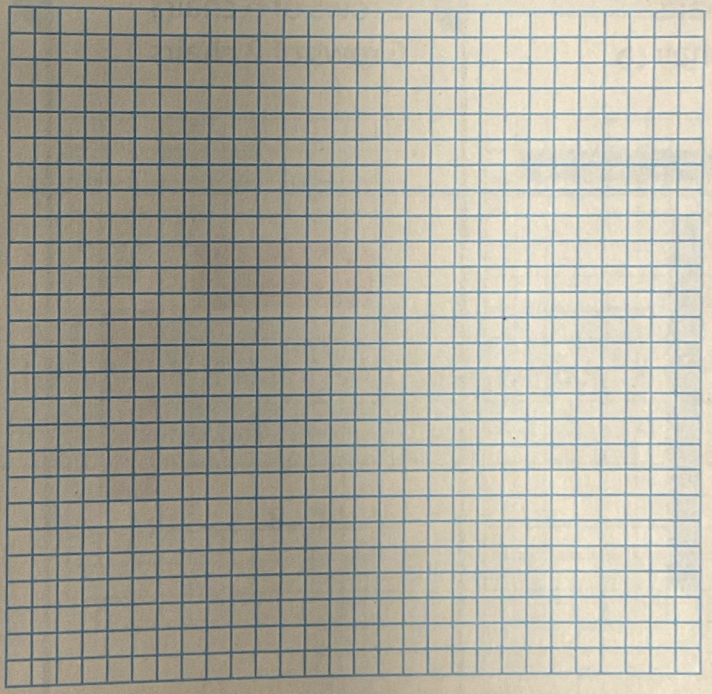
I can ...
find the factors of a whole number.

Content Standard 4.OA.B.4
Mathematical Practices MP.2, MP.3, MP.5, MP.7

Solve & Share

Fourth-graders at Ames School have 24 carpet squares. What are all the different ways they can organize the carpet squares into a rectangular array? ***Solve this problem any way you choose.***





Look Back! **MP.7 Look for Relationships** What patterns do you see in the arrays?

Learn Glossary

Essential Question

How Can You Use Arrays to Find the Factors of a Number?

A

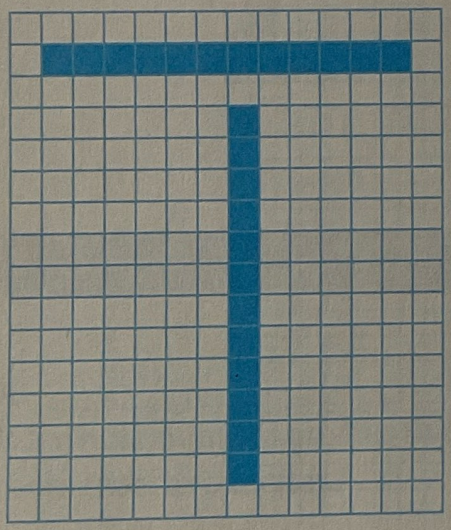
The music director is trying to find the best way to arrange the chairs for a performance. The chairs must be arranged in a rectangular array. Use grids to show all the ways the chairs can be arranged.

Pairs of numbers multiplied together to find a product are called **factors**.

12 chairs

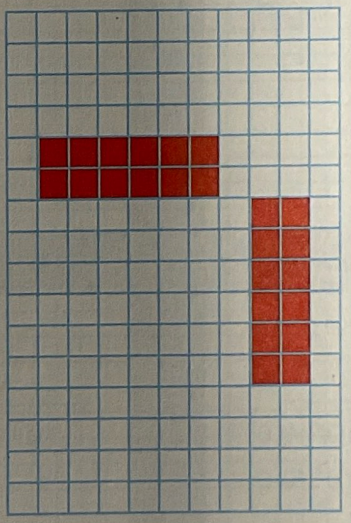
B

1 row of 12 chairs
12 rows of 1 chair



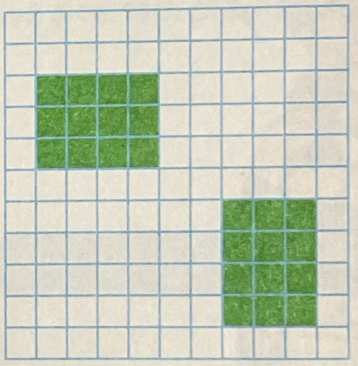
C

2 rows of 6 chairs
6 rows of 2 chairs



D

3 rows of 4 chairs
4 rows of 3 chairs



There are 6 possible ways the 12 chairs can be arranged.

The factors of 12 are 1, 2, 3, 4, 6, and 12.

Convince Me! **MP.3 Critique Reasoning** Blake says, "Every number can be shown with at least two arrays." Do you agree? Explain.

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Name _____

Practice Buddy | Tools | Assessment

Guided Practice*

Do You Understand?

1. **MP.2 Reasoning** How are the lengths of the sides of the arrays shown on the grids on the previous page related to the factors of 12?

2. What are the lengths of the sides of the arrays that show how 5 chairs can be arranged?

Do You Know How?

For **3–4**, use grids to find all the possible arrays for each number.

3. 6

4. 16

For **5–6**, use grids to find the factors of each number.

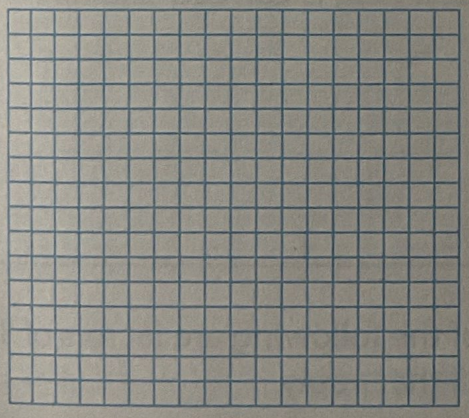
5. 45

6. 30

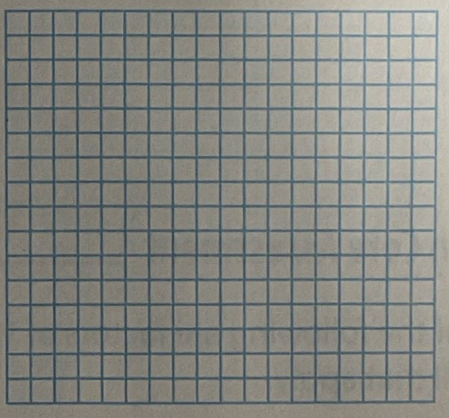
Independent Practice

For **7–8**, use the grids to find all the possible the arrays for each number. Use the arrays to help write the factors.

7. 9



8. 14



For **9–14**, use grids to find the factors for each number.

9. 5

10. 25

11. 8

12. 36

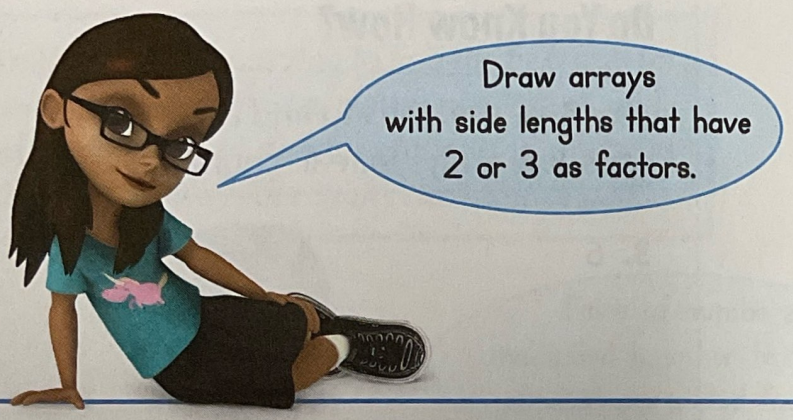
13. 23

14. 27

*For another example, see Set A on page 401.

Math Practices and Problem Solving

15. **MP.2 Reasoning** Use the grid to find two numbers that have 2 and 3 as factors.



16. The dwarf planet Pluto takes about 90,403 days to orbit the sun. Write this number in expanded form and using number names.

17. David makes 17 dollars in an hour and works 25 hours each week. Linda makes 25 dollars in an hour and works 17 hours each week. How much do David and Linda make together each week? What property of multiplication does this represent?

18. What do you notice about the number of possible arrays and the number of factors of 22?

19. **Higher Order Thinking** Jane says 5 is a factor of every whole number that has a 5 in the ones place. Fred says 5 is a factor of every whole number that has a 0 in the ones place. Who is correct? Explain.

Common Core Assessment

20. Which of the following are factors of 18? Select all that apply.

- ☐ 1
- ☐ 2
- ☐ 4
- ☐ 6
- ☐ 23

21. Which of the following are factors of 31? Select all that apply.

- ☐ 1
- ☐ 3
- ☐ 7
- ☐ 31
- ☐ 62

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