

Name _____

Factors and Divisibility

I Can determine if one number is a factor of another number.

Florida's B.E.S.T.

- Algebraic Reasoning 4.AR.3.1, 4.AR.1.1
- Number Sense & Operations 4.NSO.2.1
- Mathematical Thinking & Reasoning MTR.2.1, MTR.3.1, MTR.4.1, MTR.5.1, MTR.7.1

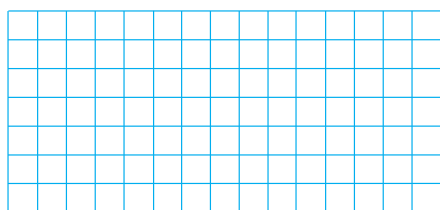


UNLOCK the Problem Real World

Students in Carlo's art class painted 32 square tiles for a mosaic. They will arrange the tiles to make a rectangle. Can the rectangle have 32 tiles arranged into 3 equal rows, without gaps or overlaps?

One Way Draw a model.

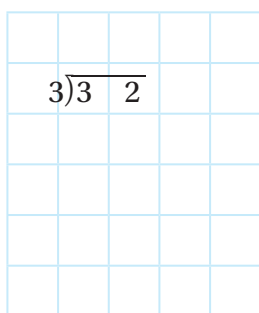
Think: Try to arrange the tiles into 3 equal rows to make a rectangle.



A rectangle _____ have 32 tiles arranged into 3 equal rows.

Another Way Use division.

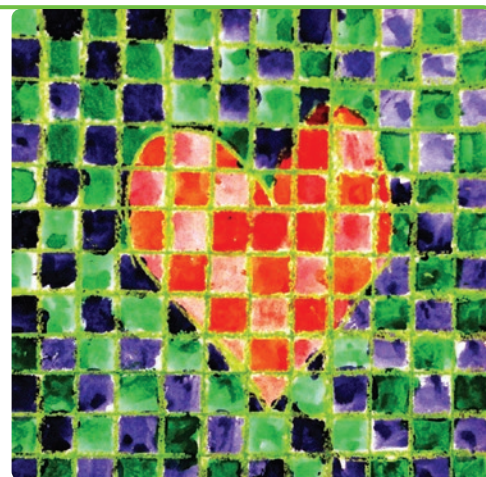
If 3 is a factor of 32, then the unknown factor in $3 \times \square = 32$ is a whole number.



Think: Divide to see whether the unknown factor is a whole number.

The unknown factor in $3 \times \square = 32$ _____ a whole number.

So, a rectangle _____ have 32 tiles arranged in 3 rows.



▲ Mosaics are decorative patterns made with pieces of glass or other materials.

Math Idea

A factor of a number divides the number evenly. This means the quotient is a whole number and the remainder is 0.

Math Talk

- Explain how you can tell if 4 is a factor of 30.

MTR 4.1 Engage in discussions on mathematical thinking.

How does the model relate to the quotient and remainder for $32 \div 3$?

Go Online For more help

Divisibility Rules A number is **divisible** by another number if the quotient is a counting number and the remainder is 0.

Some numbers have a divisibility rule. You can use a divisibility rule to tell whether one number is a factor of another.

Is 6 a factor of 72?

Think: If 72 is divisible by 6, then 6 is a factor of 72.

Test for divisibility by 6:

Is 72 even? _____

What is the sum of the digits of 72?

_____ + _____ = _____

Is the sum of the digits divisible by 3?

72 _____ divisible by 6

So, 6 is a factor of 72.

Divisibility Rules	
Number	Divisibility Rule
2	The number is even.
3	The sum of the digits is divisible by 3.
5	The last digit is 0 or 5.
6	The number is even and divisible by 3.
9	The sum of the digits is divisible by 9.

Try This! List all the factor pairs for 72 in the table.

Complete the table.

Factors of 72	
$1 \times 72 = 72$	1, 72
_____ $\times$ _____ = _____	_____, _____
_____ $\times$ _____ = _____	_____, _____
_____ $\times$ _____ = _____	_____, _____
_____ $\times$ _____ = _____	_____, _____
_____ $\times$ _____ = _____	_____, _____

Show your work.



MTR 4.1 Engage in discussions on mathematical thinking.

How are divisibility and factors related? Explain.

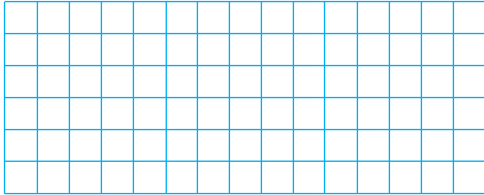
- How did you check if 7 is a factor of 72? Explain.

Share and Show



1. Is 4 a factor of 28? Draw a model to help.

Think: Can you make a rectangle with 28 squares in 4 equal rows?



4 _____ a factor of 28.

Is 5 a factor of the number? Write *yes* or *no*.

2. 27

✓ 3. 30

4. 36

✓ 5. 53

Math Talk

MTR 4.1

Engage in discussions on mathematical thinking.

If 3 is a factor of a number, is 6 always a factor of the number? If not, give an example.

On Your Own

Is 9 a factor of the number? Write *yes* or *no*.

6. 54

7. 63

8. 67

9. 93

List all the factor pairs in the table.

10.

Factors of 24	
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____

11.

Factors of 39	
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____
_____ × _____ = _____	_____, _____

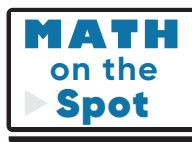
List all the factor pairs for the number. Make a table to help.

12. 56

13. 64

Problem Solving · Applications

Use the table for Problems 14–15.



14. Dirk bought a set of stamps. The number of stamps in the set he bought is divisible by 2, 3, 5, 6, and 9. Which set is it?

15. Geri wants to put 6 stamps on some pages in her stamp book and 9 stamps on other pages. Explain how she could do this with the stamp set for Sweden.

16. **MTR** George said if 2 and 4 are factors of a number, then 8 is a factor of the number. Is he correct? Explain.

17. Classify the numbers. Some numbers may belong in more than one box.

27	45	54	72	81	84
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Divisible by 5 and 9	Divisible by 3 and 9	Divisible by 2 and 6

Stamps Sets	
Country	Number of stamps
Germany	90
Sweden	78
Japan	63
Canada	25

Show the Math

Demonstrate Your Thinking

Factors and Divisibility

Go Online

Interactive Examples

Is 6 a factor of the number? Write *yes* or *no*.

1. 36

2. 56

3. 42

4. 66

Think: $6 \times 6 = 36$

yes

Is 5 a factor of the number? Write *yes* or *no*.

5. 38

6. 45

7. 60

8. 39

List all the factor pairs in the table.

9.

Factors of 12	
_____ $\times$ _____ = _____	_____, _____
_____ $\times$ _____ = _____	_____, _____
_____ $\times$ _____ = _____	_____, _____

10.

Factors of 25	
_____ $\times$ _____ = _____	_____, _____
_____ $\times$ _____ = _____	_____, _____
_____ $\times$ _____ = _____	_____, _____

11. List all the factor pairs for 48. Make a table to help.

Problem Solving



12. Bryson buys a bag of 64 plastic miniature dinosaurs. Could he distribute them equally into six storage containers and not have any left over? Explain.

13. **WRITE** *Math* Find the factors of 42. Show and explain your work, and list the factor pairs in a table.

Lesson Check

14. Write three numbers greater than 20 that have 9 as a factor.
15. What digit(s) can be in the ones place of a number that has 5 as a factor?

Spiral Review

16. Write an expression that can be used to find 4×275 using mental math and properties of numbers.
17. Jack broke apart 5×216 as $(5 \times 200) + (5 \times 16)$ to multiply mentally. What strategy did Jack use?

18. Jay has \$55. She earns \$67 by doing chores. How much money does Jay have now?
19. Trina has 72 collector's stamps. She puts 43 of the stamps into a stamp book. How many stamps are left?
