



**THIRD SPACE
LEARNING**

Math Intervention Pack

**Finding Factors and Factor
Pairs**

Grade 4

How to use the resources

1. Title Slide

Use this slide to activate prior knowledge needed for lesson. Students should be encouraged to initially attempt the question presented independently.

2. Let's Learn

Use this slide to introduce the concept. Tutors should work with the student to explore the concept together, usually using diagrams to support understanding.

3. Follow Me + Your Turn

The tutor should work through the follow me slide, modeling the process and explaining their thinking out loud.

Students should use the your turn slide as an opportunity to work through a question similar to the follow me questions. They should apply the method modeled by the tutor in the follow me slide. Students should be encouraged to explain their thinking out loud.

4. You Do

Students should work through a range of questions that build in complexity.

Tutors can offer support but students should initially be encouraged to attempt these questions independently.

5. Go Further

Use this slide to allow students to apply their understanding to a more challenging question in an unfamiliar context.

6. Support for Slides

The support slide is used to support students during the lesson. In the tutor notes, there will be guidance as to when to use the support slide.

7. Check Your Understanding

Tutors should use this slide to assess the student's knowledge and whether or not they have mastered the concept within the lesson.

Standard

4.OA.4: Find all factor pairs for a whole number in the range 1–100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1–100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1–100 is prime or composite.

Key Mathematical Ideas

1. Identify the factors of a given number
2. Identify the common factors and greatest common factor (GCF) of two given numbers.
3. Find all factor pairs for a given whole number in the range of 1–100.

Overview

Terminology

- **Factor:** A factor is one of the numbers multiplied to find a product.
- **Common factor:** A factor that is shared by two or more numbers.
- **Factor pair:** A pair of numbers that, when multiplied, give a product.
- **Greatest common factor (GCF):** The GCF of two or more numbers is the largest factor that the numbers share.
- **Product:** The result when two numbers are multiplied.

Sentence Stems

- A factor pair of is x
- The factors of are , ,
- The greatest common factor (GCF) of and is

Overview

Common Misconceptions

Common Misconceptions	Tutoring Strategies	Checks for Understanding
Students confuse the term factor and multiple.	A factor is one of the numbers a student would multiply to get a product, or multiple. Explain to students that they multiply to get a multiple, or define multiple of a number as the product of the number.	What are whole numbers you could multiply by 2 and get an answer? ($2 \times 2 = 4$; therefore, 4 is a multiple of 2).

Title Slide

If stuck

- Students may or may not know what a factor is, or may confuse a factor with a multiple.
- Remind students that a factor is a number that could be multiplied to get to the given number.
- If they still struggle, do not teach the slide, and move on.

Answers

- 24
- You cannot multiply 24 by a whole number to get 12.

Let's Learn (1)

If stuck

- Remind students that the numbers on either side of the factor “bug” represent a digit in a multiplication equation.
- If the factor bug is confusing for students, they can always write out the factors on the side.

Questions

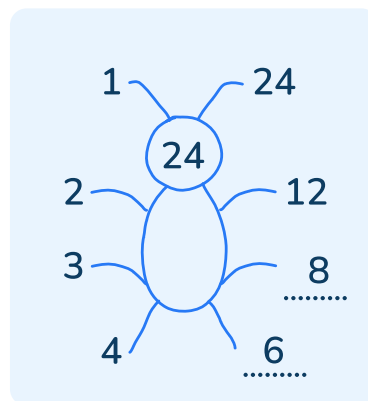
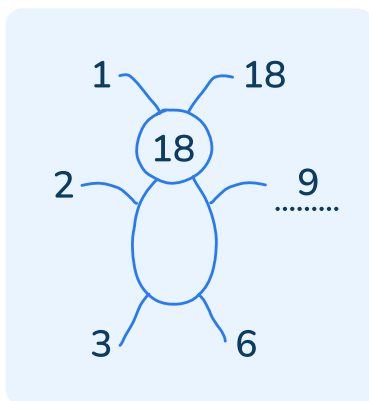
- 2 times what number will give you 18? $2 \times 9 = 18$
- 3 times what number will give you 24? $3 \times 8 = 24$
- 4 times what number will give you 24? $4 \times 6 = 24$
- Which numbers are factors of BOTH 18 and 24? (1,2,3,6)
- What is the greatest common factor (GCF) of 18 & 24? (6)

Watch out for

- Students may confuse factors with multiples.

Answers

a.



b. 1, 2, 3, 6

c. 6

Let's Learn (2)

If stuck

- Remind students that we are trying to find two numbers that, when multiplied together, will give you 18 or 24.
- If the factor bug is confusing for students, they can always write out the factors on the side.

Questions

- Looking at the factor bug for 18, what are the pairs of factors, or numbers, that when multiplied together will result in 18? (1×18 , 2×9 , 3×6)
- Looking at the factor bug for 24, what are the pairs of factors, or numbers, that when multiplied together will result in 24? (1×24 , 2×12 , 3×8 , 4×6)

Watch out for

- Students may confuse factors with multiples.

Answers

- a. 2×9
- b. 3×8 and 4×6

Follow Me

Modeling prompts

- We are going to find the common factors of 12 and 15. I like to begin with 1 and work my way up until numbers start repeating themselves.
- a) Let's start with 12. All numbers will have a factor of 1, so we know that one already. So let's think, $1 \times \dots$ will give us 12? (12)
- We know that 12 is an even number, so we know 2 will also be a factor. $2 \times \dots = 12$? (6)
- I know that if we multiply 3×4 , that equals 12, so 3 and 4 must also be factors.
- b) Now let's do the same with 15.
- 1×15 will equal 15.
- And since 15 ends with a 5, I know that it has 5 as a factor. 5×3 will give me 15. Therefore, 3 and 5 are my last factors.
- We can now use our factors of 12 and 15 to answer questions c and d.
- c) We are looking for the largest factor that these two numbers have in common. It looks like the answer here is 3.
- d) We need to write a factor pair for 15 and 12. You can use any of the factors, as long as you remember that when you multiply them together, it equals the given number.

Answers

- a. 2, 3, 4, 6, 12
- b. 3, 5, 15
- c. 3
- d. 1×12 and 3×5

Your Turn

If stuck

- Remind students that the factors do not have to be listed in numerical order, so if they want to write them as they go through the factor pairs, that's fine.
- If students need a factor bug or factor tree, you can provide them with the additional help support slide.

Questions

- What are the factors of 36?
- What are the factors of 20?
- What is the greatest common factor for 36 and 20?
- Write a factor pair for 36 and write a factor pair for 20.

Watch out for

- Students may confuse factors with multiples.
- Students may think that they have to write the factors in numerical order.

Answers

- a. 1, 2, 3, 4, 6, 9, 12, 18, 36
- b. 1, 2, 4, 5, 10, 20
- c. 4
- d. 3×12 and 2×10

You Do

If stuck

- Remind students that the factors do not have to be listed in numerical order, so if they want to write them as they go through the factor pairs, that's fine.
- If students need a factor bug or factor tree, you can provide them with the additional help support slide.

Questions

- Can you find the factors of 24? 18?
- Looking at the factors they have in common, what is the greatest common factor for 24 and 18?
- Can you find the factors of 20? 16?
- Looking at the factors they have in common, what is the greatest common factor for 20 and 16?
- Using the factors from above, what are two factor pairs for 20? For 16?

Watch out for

- Students may confuse factors with multiples.
- Students may think that they have to write the factors in numerical order.

Answers

- a. 6
- b. 4
- c. 1×20 and 4×5
- d. 2×8 and 4×4

Go Further

If stuck

- The student can find the factors of 40 before answering the question.

Questions

- What are the factors of 40?
- Does $3 \times 15 = 40$?
- If not, what does it equal?
- Can we find a factor pair that is equivalent to 40?

Watch out for

- Students may confuse factors with multiples.
- Students may think that they have to write the factors in numerical order.

Answers

- Tori's thinking is incorrect. $3 \times 15 = 45$, not 40. In order for 3 and 15 to be a factor pair, they would need to be multiplied together to equal 40.
 1×40 , 2×20 , 4×10 are factor pairs of 40.

Support for Slide (1)

This slide supports the Let's Learn slide.

If stuck

- If students are struggling with online counters, it can be suggested that they use counters in person, so they are able to manipulate them, as needed.

Questions

- Using 18 counters:
 - If I make one equal row, how many counters will be on the row?
 - If I make two equal rows, how many counters will be on each row?
 - If I make three equal rows, how many counters will be on each row?

Support for Slide (2)

This slide supports any slide where the student needs a way to help find factors.

Check Your Understanding

Correct answers

- d. 3×6
- a. The student likely looked FOR a factor pair, instead of which was NOT a factor of 32. 1×32 is a factor pair of 32.
- b. The student likely looked FOR a factor pair, instead of which was NOT a factor of 32. 4×8 is a factor pair of 32.
- c. The student likely looked FOR a factor pair, instead of which was NOT a factor of 32. 2×16 is a factor pair of 32.
- d. The student recognized that $3 \times 6 = 24$, not 32, making this the incorrect factor pair.



Today you will learn about

Finding Factors and Factor Pairs

Warm-up question

Which of these numbers is not a factor of 12?

4

12

3

6

24

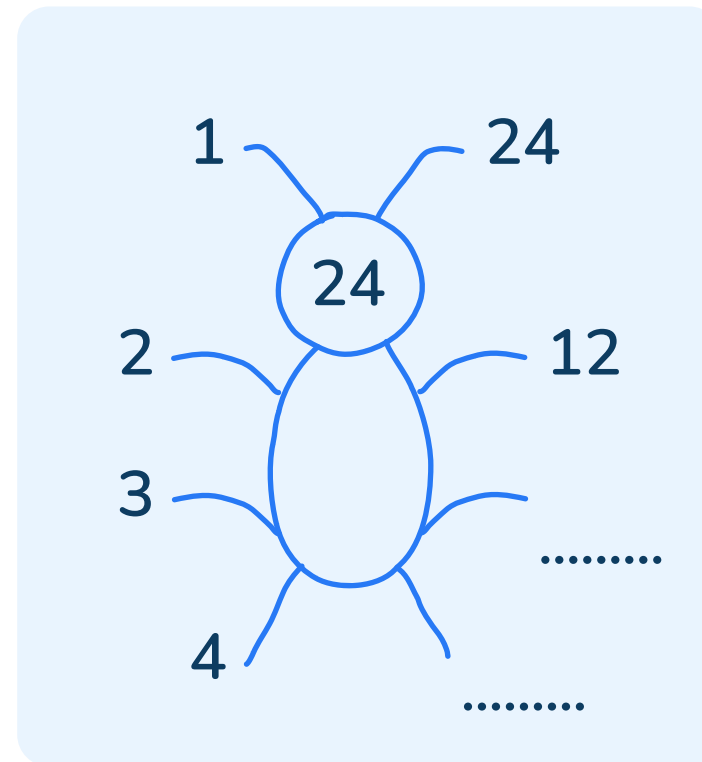
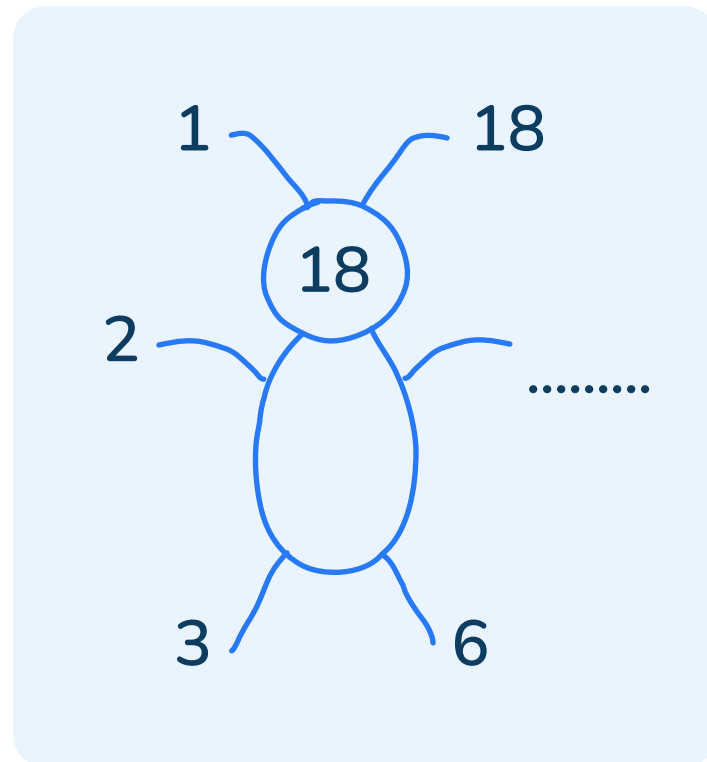
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Explain your thinking.

Let's learn

Factors are the numbers multiplied to find a **product**.
A **common factor** is a factor that is shared by **two or more numbers**.

Let's find the **common factors** of 18 and 24.



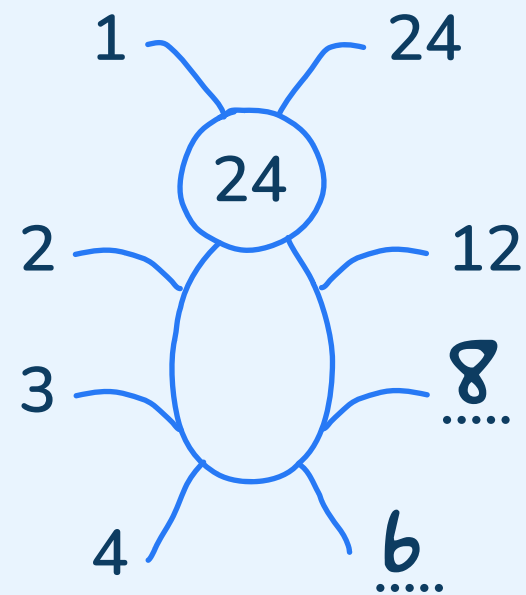
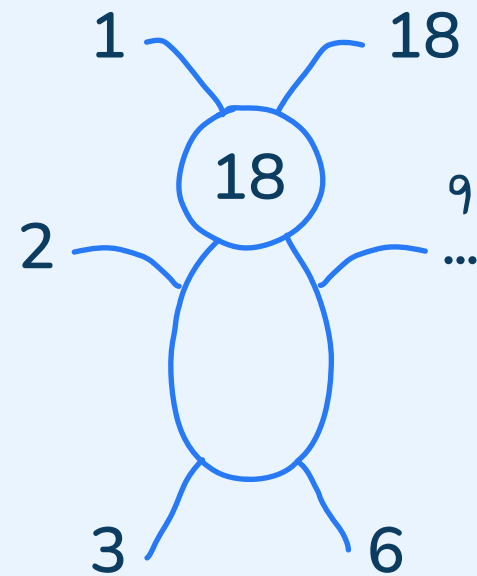
- a We can use factor bugs to help us identify the factors of each number.
- b Which numbers are factors of 18 and 24?
.....
- c What is the greatest common factor of 18 and 24?
.....

The **greatest common factor** (GCF) of two or more numbers is the largest factor that the numbers share.

Let's learn

A **factor pair** is a pair of numbers that, when multiplied, give a product.

We can use the factor bugs from before to help us write the factor pairs for 18 and 24.



a What are the factor pairs of 18?

1×18 3×6
.....

b What are the factor pairs of 24?

1×24 2×12
.....

a Which number below is the greatest common factor of 24 and 18?

2

6

4

9

12

.....

b Which number below is the greatest common factor of 20 and 16?

5

8

10

4

16

.....

c Write two factor pairs for 20.

.....

.....

d Write two factor pairs for 16.

.....

.....

Go further

Tori says that 3×15 is a factor pair of 40.

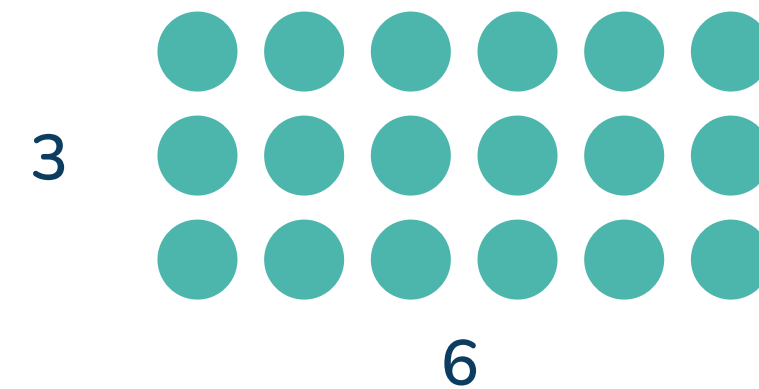
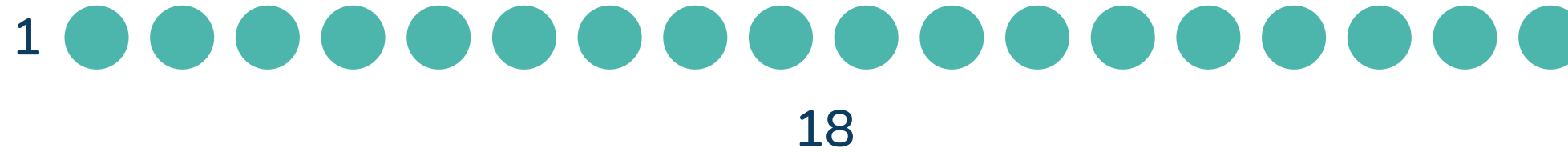
Do you agree? Explain your thinking.

.....

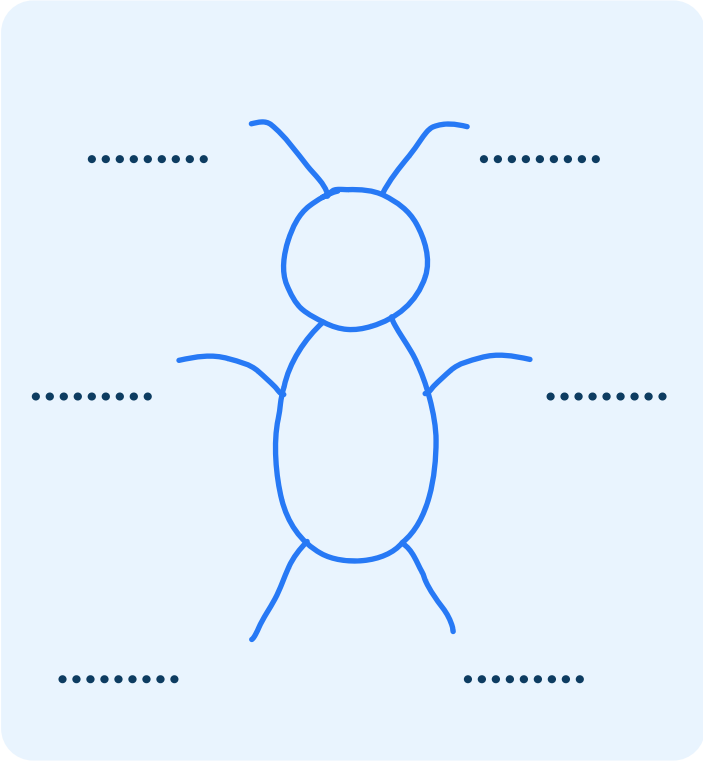
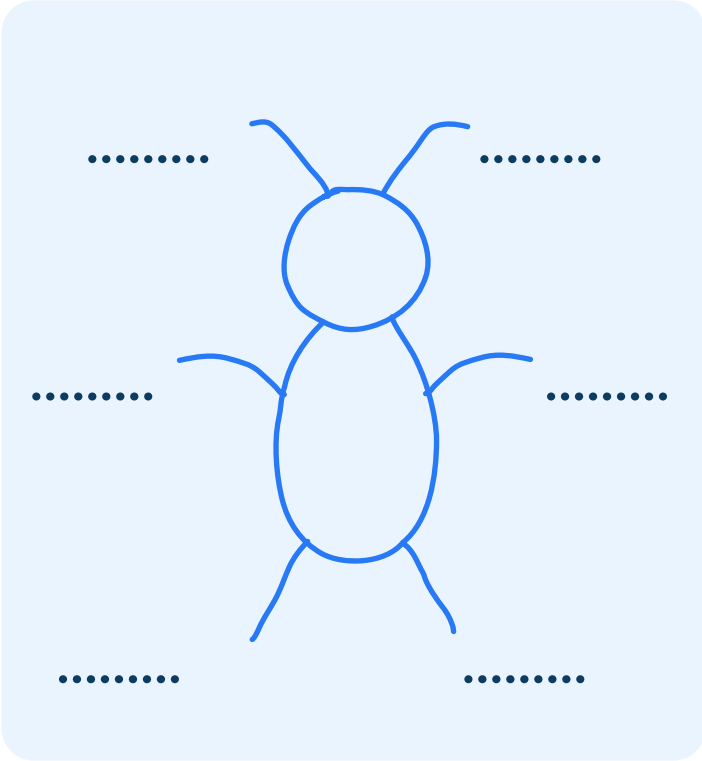
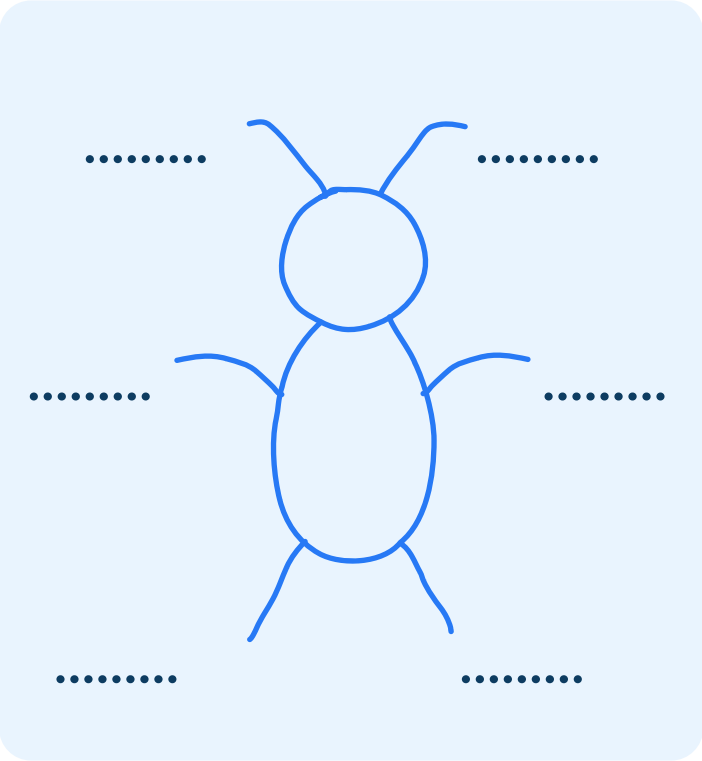
We can use **arrays** to help us find the **factors** of a number.

There are 18 counters in each **array**.

We can arrange 18 counters in different ways to find **factors** of 18.



The factors of 18 are 1, 2, 3, 6, 9, 18



Check your understanding

Which of the following expressions is **NOT** a factor pair of 32?

a

1×32

b

4×8

c

2×16

d

3×6

Why do I need to try this question on my own first?

- To show your tutor what you understand
- To give you more practice
- To show your teacher how you are doing



Do you have a group of students who need a boost in math?

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- ✓ Aligned to your state's standards
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Michelle Craig, Instructional Coach,
Sherwood Forest Elementary, Washington

Speak to us

-  thirdspacelearning.com/us/
-  +1 929-298-4593
-  hello@thirdspacelearning.com



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