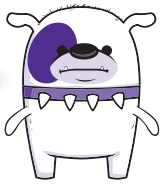
Understand Fraction Multiplication

Name: _____

Prerequisite: What does it mean to multiply numbers?



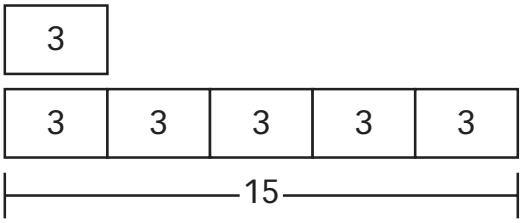
Study the example shows ways to describe multiplication. Then solve problems 1–8.

Example

Use words and models to show $5 \times 3 = 15$.

5 groups of 3 is 15.

15 is 5 times as many as 3.

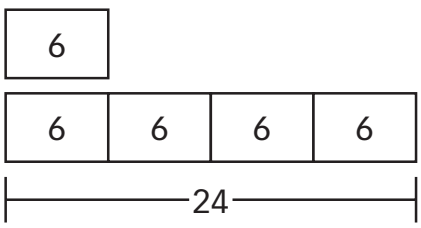


1 Complete the sentences to describe the multiplication that the picture shows.

Words: _____ groups of _____ is _____.

Equation: _____ × _____ = _____

2 Use the bar model at the right to complete the sentences.



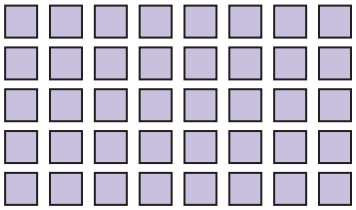
Words: _____ is _____ times as many as _____.

Equation: _____ × _____ = _____

3 How is 6×4 related to 4×6? _____

Solve.

4 Complete the sentences to describe the multiplication that the array shows.



_____ rows of _____ is _____.

_____ × _____ = _____

5 Draw and label a bar model to show 5 × 9.

6 Nick read 7 books last month. He read twice as many books this month. Draw a bar model that represents the number of books Nick read this month.

7 Look at problem 6. Write the multiplication equation that the bar model describes.

_____

8 Write a word problem that could be modeled by the equation 3 × 6 = 18.

_____

_____

_____

_____

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Show Multiplying Fractions

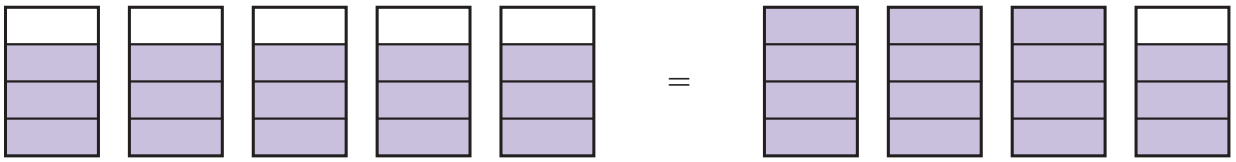
Study how the example shows how to multiply fractions. Then solve problems 1–9.

Example

Find $5 \times \frac{3}{4}$.

You can use repeated addition. $\frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4} = \frac{15}{4}$ $\frac{15}{4} = 3\frac{3}{4}$

You can draw a model.



$5 \times \frac{3}{4}$ $\frac{15}{4} = 3\frac{3}{4}$

$5 \times \frac{3}{4} = \frac{15}{4} = 3\frac{3}{4}$

1 Find $6 \times \frac{1}{4}$ using repeated addition.

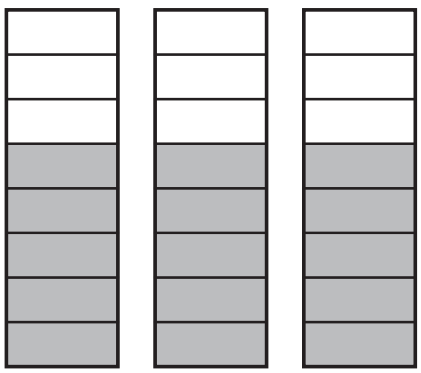
____ + ____ + ____ + ____ + ____ + ____ = ___

2 Draw a model to show $6 \times \frac{1}{4}$.

3 Use the digits 2 and 3 to complete two different multiplication problems with the same product as $6 \times \frac{1}{4}$.

$\square \times \frac{\square}{4}$ $\square \times \frac{\square}{4}$

4 Look at the model. Tell whether each expression shows the product of $3 \times \frac{5}{8}$.



a. $5 \times \frac{3}{8}$ ☐ Yes ☐ No

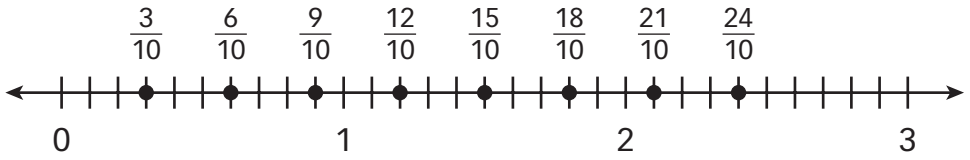
b. $\frac{5}{8} + \frac{5}{8} + \frac{5}{8}$ ☐ Yes ☐ No

c. $\frac{5}{8} \times \frac{5}{8} \times \frac{5}{8}$ ☐ Yes ☐ No

d. $15 \times \frac{1}{8}$ ☐ Yes ☐ No

Solve.

5 The number line below shows _____ $\times \frac{\square}{\square}$.



6 Label the number line below and use it to show $3 \times \frac{3}{4}$.

7 Draw a model to show $3 \times \frac{4}{5}$.

8 Look at the model you drew in problem 7.

Use the digits 2, 3, 4, 5, and 6 to write two different multiplication problems with the same product as $3 \times \frac{4}{5}$.

$\square \times \frac{\square}{\square}$ $\square \times \frac{\square}{\square}$

9 Lisa says that $3 \times \frac{1}{6}$ and $\frac{1}{6} \times \frac{1}{6} \times \frac{1}{6}$ have the same product. Is Lisa's reasoning correct? Explain.

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Reason and Write

Study the example. Underline two parts that you think make it a particularly good answer and a helpful example.

Example

Describe how you can use the same methods to find the product 4×2 and the product $4 \times \frac{2}{3}$.

Show your work. Use models, words, and numbers to explain your answer.

I can think of 4×2 as 4 groups of 2.
$4 \times 2 = 8$. 8 is 4 times as many as 2.

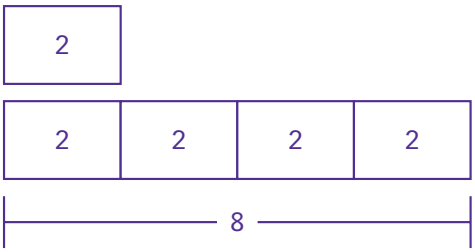
I can think of $4 \times \frac{2}{3}$ as 4 groups of 2 thirds. $4 \times \frac{2}{3} = \frac{8}{3}$.
$\frac{8}{3}$ is 4 times as many as $\frac{2}{3}$.

I can find both products using repeated addition.

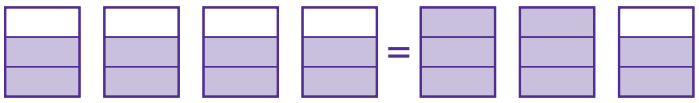
$2 + 2 + 2 + 2 = 8$

$\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{8}{3}$

I can use a model to show $4 \times 2 = 8$.

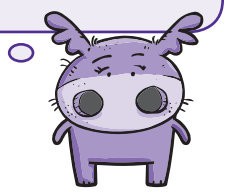


I can use a model to show $4 \times \frac{2}{3} = \frac{8}{3}$.



Where does the example . . .

- use words to explain?
- use numbers to explain?
- use models to show how the products are alike?



Solve the problem. Use what you learned from the example.

Describe how you can use the same methods to find the product 2×3 and the product $2 \times \frac{3}{4}$.

Show your work. Use words, models, and numbers to explain your answer.

Did you . . .

- use words to explain?
- use numbers to explain?
- use models to show how the products are alike?