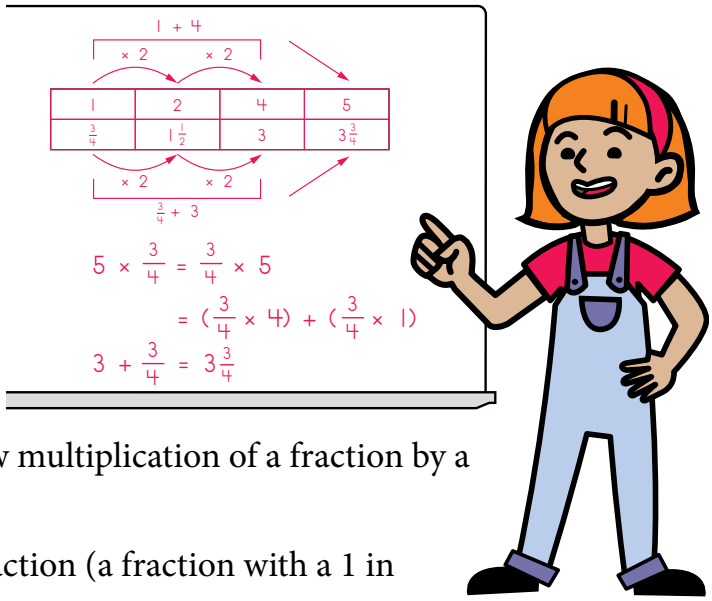
Bridges in Mathematics
Grade 5 Unit 5

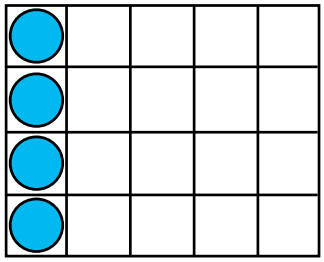
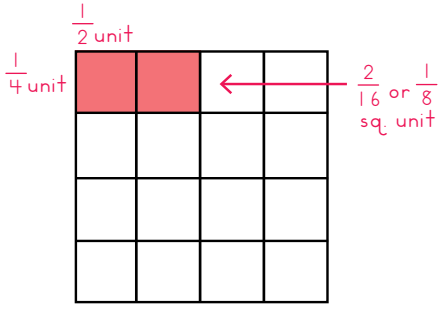
# Multiplying & Dividing Fractions

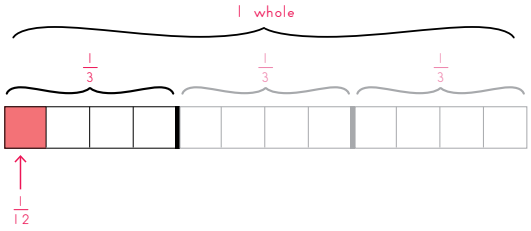
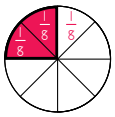



In this unit, your student will:

- Multiply fractions by whole numbers such as $12 \times \frac{1}{3} = \frac{12}{3} = 4$
- Use rectangular area models to show multiplication of a fraction by a fraction, such as $\frac{1}{3} \times \frac{3}{4} = \frac{1}{4}$
- Divide a whole number by a unit fraction (a fraction with a 1 in the numerator) such as, $4 \div \frac{1}{3} = 12$
- Divide a unit fraction by a whole number, such as $\frac{1}{3} \div 4 = \frac{1}{12}$

Your student will practice these skills by solving problems such as these:

| PROBLEM | COMMENTS |
|---|---|
| There are 20 cars in the parking lot. One-fifth of them are blue. How many cars in the parking lot are blue?<br>  <br>1/5 of 20 is equivalent to 1/5 × 20 = 20 ÷ 5 = 4<br>4 cars are blue | In this unit, students learn that a problem like $\frac{1}{5} \times 20$ can also be written as $\frac{1}{5}$ of 20 and that one way it can be solved is by dividing 20 by 5.<br>A collection of objects can be a visual model for making sense of $\frac{1}{5} \times 20$. Arranging the objects into an array helps students visualize 5 equal groups to see that each group has 4 cars. Additionally, the visual image helps students keep track of their own reasoning and share it with others. |
| What is $\frac{1}{2} \times \frac{1}{4}$ ?<br>  <br>The large square is worth 1 square unit. | Students can also use an area model to multiply fractions. The two factors (in this example, $\frac{1}{2}$ and $\frac{1}{4}$) are the dimensions of the rectangle. The product ($\frac{1}{8}$) is the area of the rectangle.<br>A visual model like this one can help students understand how the product of $\frac{1}{2}$ and $\frac{1}{4}$ can be less than both of the factors. |

| PROBLEM | COMMENTS |
|---|---|
| Solve. $\frac{1}{3} \div 4 = \frac{1}{12}$<br>  <br>*When you break each third into 4 equal parts, each of those smaller pieces is 1/12 of the whole, so* $\frac{1}{3} \div 4 = \frac{1}{12}$. | To make sense of dividing a unit fraction by a whole number, students can use a visual model to divide the unit fraction into equal parts. For example, students can represent $\frac{1}{3} \div 4$ using a visual model like this fraction bar and by dividing $\frac{1}{3}$ up into 4 equal parts. |
| Jim was sharing a pizza with some friends. He took $\frac{3}{8}$ of the pizza, but he only ate $\frac{2}{3}$ of the pizza he took. How much of the whole pizza did Jim eat?<br>  <br>Jim took 3 pieces and each one was $\frac{1}{8}$ of the whole pizza. But he only ate $\frac{2}{3}$ of what he took. So he ate only 2 eighths, and that is equal to $\frac{1}{4}$ of the whole pizza. Jim ate $\frac{1}{4}$ of the pizza. | One way to solve this problem is to use a visual model to show $\frac{3}{8}$ of a pizza and then use the model to reason about the problem.<br>Toward the end of the unit, students will also explore a general algorithm for multiplying fractions. |

For additional support, you can use the Math Vocabulary Cards app at apps.mathlearningcenter.org.

## Frequently Asked Questions About Unit 5

### Q: I learned about fractions a long time ago. How can I help?

**A:** Students do most of their sensemaking in class using visual models and logic to think about fractions, so invite your student to talk about the models they use in class. Convey curiosity and confidence in your student's reasoning and be open to learning their strategies for making sense of fractions. You don't have to have all the answers to be helpful!

### Q: How can I support my student's learning?

**A:** To support your student in learning how to operate with fractions, you can:

- Visit mathathome.mathlearningcenter.org and work through some or all of the activities in Grade 5: Set 5 together. These activities complement the learning that takes place in the classroom during Unit 5 and provide fun ways to engage children in mathematical thinking. This set also includes digital versions of games that your student has learned at school, such as Target 1 Fractions and Tic-Frac-Toe.
- Think about where you use fractions in your life, and share your experiences with your student. They may be able to show you their way of multiplying fractions and whole numbers, as well as division with unit fractions and whole numbers. For example, a recipe might call for $\frac{2}{3}$ cup of flour. If you make half the recipe ($\frac{1}{2} \times \frac{2}{3}$), you'd need only $\frac{1}{3}$ cup of flour. Or you could double the recipe ($2 \times \frac{2}{3}$), and determine that you'd need $\frac{4}{3}$ cup of flour, or $1\frac{1}{3}$ cups.
- Visit apps.mathlearningcenter.org and invite your student to explore the Fractions, Math Clock, Geoboard, Number Line, and Money Pieces apps. Throughout Unit 5, students explore fraction operations with these and other models.
- If your student would enjoy learning about math concepts through literature, consider looking for math-related books at your local library. Some suggestions include:
  - *Multiplying Menace: The Revenge of Rumpelstiltskin* by Pam Calvert, illustrated by Wayne Geehan