

Unit 5: Multiplying and Dividing Fractions

5th Grade Math

26 Class Meetings

Revised June 2026

Essential Questions

- How do fractions help us represent, compare, and solve problems involving real-world quantities and equal sharing?
- How do multiplication and division with fractions change the size of a quantity, and how can models help us understand why?
- How can mathematical models, expressions, and data representations help us explain and justify solutions to real-world problems?

Enduring Understandings with Unit Goals

EU 1: Fractions are numbers that represent quantities, division, and relationships between parts and wholes.

- Interpret fractions as division and represent equal sharing situations.
- Add and subtract fractions and mixed numbers using equivalent fractions.
- Write, interpret, and evaluate numerical expressions involving fractions.
- Use visual models, equations, and reasoning to explain fraction relationships and solutions.

EU 2: Operations with fractions extend understanding of multiplication and division.

- Apply properties of operations to multiply and divide fractions and mixed numbers.
- Interpret multiplication of fractions as groups, area, and scaling (resizing quantities).
- Understand how multiplying or dividing by fractions affects the size of a quantity.
- Solve real-world problems involving multiplication and division of fractions using models and equations.

EU 3: Mathematical models and data representations help analyze and solve problems involving fractions.

- Represent fractional measurements using line plots.
- Use operations with fractions to interpret and solve problems based on data.
- Estimate and assess the reasonableness of solutions using benchmark fractions and number sense.
- Communicate mathematical thinking clearly using models, precise vocabulary, and mathematical reasoning.

Standards

Common Core State Standards:

- **CCSS. 5.MD.B.2**-Make a line plot to display a data set of measurements in fractions of a unit ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$). Use operations on fractions for this grade to solve problems involving information presented in line plots.
- **CCSS.5.NF.B.3**- Interpret a fraction as division of the numerator by the denominator ($\frac{a}{b} = a \div b$). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

Unit 5: Multiplying and Dividing Fractions

5th Grade Math

26 Class Meetings

Revised June 2026

- **CCSS. 5.NF.B.4**-Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
- **CCSS. 5.NF.B.4.A**- Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$.
- **CCSS. 5.NF.B.4.B**-Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths.
- **CCSS. 5.NF.B.5** -Interpret multiplication as scaling (resizing), by:
 - **5.NF.B.5.A**-Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
 - **5.NF.B.5.B** — Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.
- **CCSS. 5.NF.B.6**- Solve real-world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
- **CCSS. 5.NF.B.7**-Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.
 - **CCSS. 5.NF.B.7.A**- Interpret division of a unit fraction by a non-zero whole number and compute such quotients.
 - **CCSS.5.NF.B.7.B**- Interpret division of a whole number by a unit fraction and compute such quotients.
 - **CCSS.5.NF.B.7.C**- Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.
- **CCSS. 5.OA.A.1**-Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.
- **CCSS.5.OA.A.2**-Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them.
- **CCSS. 5.NF.A.1**-Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators.
- **CCSS.5.NF.A.2**-Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.

ISAAC Vision of the Graduate Competencies

Competency 1: Write effectively for a variety of purposes.

Competency 2: Speak to diverse audiences in an accountable manner.

Competency 3: Develop the behaviors needed to interact and contribute with others on a team.

Competency 4: Analyze and solve problems independently and collaboratively.

Competency 5: Be responsible, creative, and empathetic members of the community.

Unit 5: Multiplying and Dividing Fractions

5th Grade Math

26 Class Meetings

Revised June 2026

Unit Content Overview

1. Fractions as Numbers and Division

- Review fractions as quantities representing parts of a whole and parts of a set using visual models.
- Interpret fractions as division ($a/b = a \div b$).
- Represent equal sharing situations that result in fractional or mixed number answers.
- Generate equivalent fractions to create common denominators.
- Add and subtract fractions and mixed numbers with unlike denominators.
- Write, interpret, and evaluate numerical expressions involving fractions using parentheses and grouping symbols.
- Solve real-world problems involving fraction addition, subtraction, and division.
- Use benchmark fractions and estimation to assess the reasonableness of solutions.

2. Multiplication and Division with Fractions

- Interpret multiplication of fractions as equal groups, parts of a partitioned whole, and scaling.
- Multiply whole numbers and fractions using visual models such as number lines, tape diagrams, and area models.
- Find the area of rectangles with fractional side lengths using tiling and multiplication.
- Multiply fractions and mixed numbers using efficient strategies and equations.
- Interpret division of unit fractions by whole numbers and whole numbers by unit fractions.
- Model fraction division using drawings, equations, and real-world contexts.
- Analyze how multiplying or dividing by fractions changes the size of a quantity.
- Solve real-world problems involving multiplication and division of fractions and mixed numbers.

3. Representing and Analyzing Data with Fractions

- Collect and represent measurement data using fractional units.
- Create line plots displaying data in fractions such as $1/2$, $1/4$, and $1/8$.
- Interpret information presented in line plots.
- Use fraction operations to solve problems involving measurement data.
- Compare data sets and describe patterns shown in graphical representations.
- Explain solutions and conclusions using mathematical reasoning, models, and precise vocabulary.

Vocabulary and Key Terms: fraction, numerator, denominator, equal shares, division, dividend, divisor, quotient, unit fraction, non-unit fraction, equivalent fractions, simplify, multiply, product, repeated addition, scaling, factor, multiple, mixed number, improper fraction, tape diagram, number line, area model, partition, subdivide, fraction model, fraction multiplication, fraction division, reciprocal reasoning, groups, parts of a whole, estimation, benchmark fractions, real-world problem, mathematical expression, equation, strategy, representation, visual model, reasoning, justification, data, measurement, line plot, dot plot, frequency, distribution, compare data, interpret data, mathematical explanation

Interdisciplinary Connection:

- ELA

Unit 5: Multiplying and Dividing Fractions

5th Grade Math

26 Class Meetings

Revised June 2026

Daily Learning Objectives with TWPS

Students will be able to...

- Relate equal shares of objects to division expressions and visual representations of fractions.
 - *Patrick thought that the pattern means you just repeat the numbers. What should Patrick have written in the box with the arrow? What is the rule?*
- Solve division problems when the quotient is a fraction or mixed number, including cases with larger values.
 - *At Outdoor Adventure Campground, campers can sit at tables with 8 chairs or 10 chairs. Six pizzas are served at the table with 8 chairs. Eight pizzas are served at the table with 10 chairs. Pizzas are divided equally at each table. What table would you want to sit at?*
- Multiply a fraction by a whole number.
 - *Which word problem has an answer that is a mixed number?*
- Relate multiplication of a fraction by a whole number to multiplication of a whole number by a fraction and use this to develop a general method to multiply any fraction by any whole number (or vice versa).
 - *Three dancers share 2 liters of water. Mia says that each dancer gets $\frac{3}{2}$ of a liter of water because 3 divided into 2 equal groups is $\frac{3}{2}$. Do you agree with Mia?*
- Find the fractional part of a set by multiplying a whole number by a fractions.
 - *Math Mobile*
- Multiply a whole number by a mixed number.
 - *Sergio has read $\frac{2}{3}$ of his 150 page book. Marta has read $\frac{2}{5}$ of her 250 page book. Who has read more of their book?*
- Multiply a fraction by a fraction using visual models.
 - *What is Jason's mistake? What is the correct answer?*
- Multiply a fraction by a fraction.
 - *Abby is making rice for 12 people. A serving for 1 person is about $\frac{1}{2}$ cup. Some people want a smaller serving of about $\frac{1}{3}$ of a cup. Decide how much is a reasonable amount of rice for her to make.*
- Multiply mixed numbers by fractions.
 - *Mr. Vang uses $\frac{1}{6}$ of his backyard for a garden. He uses $\frac{1}{5}$ of the garden to grow flowers, shown shaded in yellow on the diagram. What fraction of Mr. Vang's backyard is used for the flower garden?*
- Multiply mixed numbers by mixed numbers.
 - *What mistake did Yesenia make when multiplying the fractions?*
- Develop a general method to multiply with mixed numbers.
 - *What rule or process works every time when multiplying mixed numbers? Why does it work?*
- Solve real-world problems involving multiplication with fractions and mixed numbers and create real-world contexts for expressions involving multiplication with mixed numbers.
 - *Enter a value for b that makes this statement true: $10 \times b$ is less than 10 but greater than 0.*
- Interpret multiplication as scaling.
 - *Sam used $2\frac{2}{6}$ cups of flour to make a pie crust. He also used $1\frac{1}{3}$ cups of flour for the topping. How much flour did Sam use altogether?*

Unit 5: Multiplying and Dividing Fractions

5th Grade Math

26 Class Meetings

Revised June 2026

- *Fill in the blanks with $>$, $<$, or $=$. $8 \times \frac{1}{2}$ _____ 8 , $10/6 \times 3$ _____ 3 , $7/7 \times 2 \frac{3}{4}$ _____ $2 \frac{3}{4}$*
- Divide a unit fraction by a whole number.
 - *Mr. Winston is preparing juice for his guests. Each container holds only 1 liter of juice. He will prepare 2 glasses of juice for each guest. Each glass holds 250 milliliters of juice. He will have no more than 8 guests. He plans to serve juice the next two hours. What is the greatest number of containers Winston will need?*
- Divide a whole number by a unit fraction.
 - *When is the inequality true? $80 \times n > 80$.*
- Solve real-world problems involving division with fractions and create real-world contexts for expressions involving division with fractions.
 - *s*
- Solve real-world problems involving multiplication and division with fractions.
 - *How do you decide whether a situation requires multiplication or division with fractions?*
- Create line plots.
 - *Why does a line plot a useful way to organize measurement data?*
- Solve problems involving information presented in a line plot (dot plot).
 - *How can the distribution of dots on a line plot help you answer questions about the data?*

Instructional Strategies/Differentiated Instruction

- Whole group instruction
- Teacher modeling
- Think-write-pair-share and small-group discussions
- Graphic organizers
- Manipulatives
- Number lines
- Accountable talk
- Homework
- Word walls with visuals
- Small group instruction
- Exemplars

EL Differentiation Strategies

- Word Banks and Word Walls with visuals
- Culturally responsive teaching
- Explicit teacher modeling
- Key vocabulary
- Graphic organizers
- Strategic Grouping
- Non-verbal assessments

Unit 5: Multiplying and Dividing Fractions

5th Grade Math

26 Class Meetings

Revised June 2026

Assessments

FORMATIVE ASSESSMENTS:

- Do Now
- Academic Discourse
- Exit Slips
- Accountable Talk Discussions
- Completed notes
- Homework
- Performance Task -- “School Carnival” Performance Task
 - Teacher’s rubric/scoring guide

SUMMATIVE ASSESSMENTS:

- Quiz: Fractions as Numbers and Division, Multiplication and Division with Fractions (EU1, EU2)
- IAB
- Unit Task: “Talent Show Night” Performance Task (EU1, EU2 and EU3)

Unit Task

Unit Task Name: “Talent Show Night” Performance Task

Description: Upon completion of the unit students apply their understanding of fraction operations and numerical reasoning to plan and organize a school talent show. Through a series of real-world problem-solving situations, students demonstrate their ability to interpret fractions as division, multiply and divide fractions and mixed numbers, analyze how multiplication acts as scaling, and represent data involving fractional measurements. Students solve multi-step problems related to scheduling performances, determining stage space, calculating equipment usage, and analyzing rehearsal time data.

Evaluation: Teacher’s Scoring Guide

Unit Resources

- Google Classroom
- Pear Assessment
- Math In Focus
- Math Antics
- State Common Core Standards Transition Tasks
- Match Fishtank
- Worksheets
- Individual White boards
- Interactive notebook
- Laptops
- SBAC Prep Online