

## Unit 6: Multiplying and Dividing Decimals

### 5<sup>th</sup> Grade Math

26 Class Meetings

*Revised June 2026*

#### Essential Questions

- How can we use place value, models, and properties of operations to multiply and divide decimals and explain our thinking?
- How can we write, interpret, and evaluate numerical expressions to represent and solve problems?
- How can converting measurement units help us solve real-world problems involving decimals?

#### Enduring Understandings with Unit Goals

**EU 1:** Understanding that place value and properties of operations can be used to multiply and divide decimals efficiently and accurately.

- Use base-ten models and drawings to represent decimal operations.
- Multiply decimals to the hundredths using place value strategies.
- Divide decimals to the hundredths using place value and the relationship between operations.
- Use estimation to assess the reasonableness of decimal products and quotients.
- Explain and justify strategies using place value and properties of operations.

**EU 2:** Recognizing that numerical expressions can represent real-world situations and can be written, interpreted, and evaluated using order of operations.

- Write numerical expressions to represent real-world and mathematical situations.
- Interpret numerical expressions without solving them.
- Evaluate expressions using parentheses, brackets, or braces.
- Analyze how grouping symbols affect the value of an expression.
- Connect expressions to problem-solving situations involving decimals.

**EU 3:** Understanding that converting measurement units within a system allows us to solve multi-step, real-world problems involving decimals.

- Convert between different-sized units within a measurement system (e.g., cm, m, km; g, kg).
- Use multiplication and division with decimals to perform conversions.
- Solve multi-step, real-world problems involving measurement and decimal operations.
- Represent measurement problems using equations and expressions.
- Check for reasonableness of solutions using estimation and benchmarks.

#### Standards

##### Common Core State Standards:

- **CCSS.5.MD.A.1**-Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.
- **CCSS.5.NBT.B.7**- Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

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- **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.4.MD.A.1-** Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two column table.
- **CCSS.4.MD.A.2-** Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.
- **CCSS.5.NBT.A.1-** Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.
- **CCSS.5.NBT.A.2-** Explain patterns in the number of zeros of the product when multiplying a number by powers of 10 and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
- **CCSS.5.NBT.A.4-** Use place value understanding to round decimals to any place.
- **CCSS.5.NBT.B.5-** Fluently multiply multi-digit whole numbers using the standard algorithm.
- **CCSS.5.NBT.B.6-** Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
- **CCSS.5.NF.B.3-** Interpret a fraction as division of the numerator by the denominator ( $a/b = a \div b$ ). 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.
- **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.7-** Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. Students able to multiply fractions in general can develop strategies to divide fractions in general, by reasoning about the relationship between multiplication and division. But division of a fraction by a fraction is not a requirement at this grade.

### 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.

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#### Unit Content Overview

##### 1. Multiplying and Dividing Decimals

- Understand decimals as extensions of fractions representing parts of a whole and parts of a set.
- Use visual models (base-ten blocks, area models, number lines) to represent decimal operations.
- Multiply and divide decimals using place value understanding and properties of operations.
- Connect decimal operations to fraction multiplication and division.
- Estimate and assess the reasonableness of products and quotients.

##### 2. Decimal Real-World Problems

- Interpret decimal multiplication as equal groups, partitioning, and scaling (including making quantities larger or smaller).
- Write and interpret numerical expressions to represent real-world situations involving decimals.
- Evaluate expressions using parentheses, brackets, and braces.
- Solve multi-step word problems involving decimal operations and explain reasoning.
- Analyze how different representations (models, expressions, equations) connect to problem-solving.

##### 3. Measurement Conversion

- Convert between different-sized units within a measurement system using decimals (e.g., cm ↔ m, g ↔ kg).
- Understand unit conversions as multiplicative relationships (scaling up and down).
- Solve multi-step, real-world measurement problems involving decimal operations.
- Represent measurement situations using equations and numerical expressions.
- Collect, organize, and interpret measurement data involving decimal values.

**Vocabulary and Key Terms:** decimals, decimal point, tenths, hundredths, thousandths, place value, base-ten system, digit, value, expanded form, unit form, standard form, multiply, product, factor, divide, quotient, divisor, dividend, properties of operations, distributive property, associative property, commutative property, partial products, area model, number line, base-ten blocks, estimate, rounding, reasonableness, expression, numerical expression, equation, parentheses, brackets, braces, order of operations, evaluate, interpret, write expressions, scaling, equal groups, partition, real-world problem, multi-step problem, measurement, conversion, unit, metric system, customary units, length, mass, volume, centimeters, meters, kilometers, grams, kilograms, liters, milliliters, data, represent, compare

##### Interdisciplinary Connection:

- ELA, Science

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#### Daily Learning Objectives with *TWPS*

##### Students will be able to...

- Multiply a single-digit whole number by a decimal in cases that involve basic facts.
  - Find each product. Be prepared to explain your reasoning.  
 $a. 4 \times 2 =$      $b. 4 \times 0.2 =$      $c. 4 \times 0.02 =$
- Estimate the product of a single-digit whole number and a decimal by rounding numbers to their largest place.
  - Estimate the following products. Do you think your estimated product in each part is greater or less than the actual product? Why?  
 $a. 4 \times 8.24$   
 $b. 0.95 \times 8$   
 $c. 6 \times 0.68$   
 $d. 0.17 \times 5$
- Multiply a single-digit whole number by a decimal
  - Multiply the following. Where should the decimal go, and why?  
 $a. 3 \times 0.4$   
 $b. 7 \times 0.6$   
 $c. 5 \times 0.2$
- Construct viable arguments and critique the reasoning of others regarding the placement of the decimal point in computations that involve multiplying a whole number by a decimal.
  - A student says, " $3 \times 0.4 = 12$  because  $3 \times 4 = 12$ ." Do you agree or disagree? Explain your reasoning and critique their thinking.
- Multiply a whole number by a decimal, reasoning about the placement of the decimal point.
  - Solve the following. How can you use place value to explain where the decimal belongs?  
 $a. 6 \times 0.25$   
 $b. 8 \times 1.3$   
 $c. 4 \times 0.75$
- Multiply a decimal by a decimal in cases that involve basic facts. Estimate the product of two decimal by rounding numbers to their largest place.
  - Estimate and then solve. Is your estimate greater or less than the actual product? Why?  
 $a. 0.4 \times 0.6$   
 $b. 0.7 \times 0.3$   
 $c. 0.9 \times 0.2$
- Multiply a decimal by a decimal, reasoning about the placement of the decimal point.
  - Multiply the following. How do you know where to place the decimal point?  
 $a. 0.6 \times 0.8$   
 $b. 0.25 \times 0.4$   
 $c. 1.2 \times 0.3$
- Multiply with decimals in all cases, seeing the general pattern for the placement of the decimal point in the product.
  - Solve and look for a pattern. What do you notice about decimal placement?  
 $a. 0.3 \times 0.2$   
 $b. 0.03 \times 0.2$   
 $c. 0.3 \times 0.02$

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- Divide a decimal by a single-digit whole number in cases that involve basic facts. Estimate quotients of decimal dividends and single-digit whole number divisors by rounding numbers to compatible numbers.
  - *Estimate and then solve. Is your estimate reasonable? Why?*
    - a.  $4.8 \div 6$
    - b.  $3.6 \div 4$
    - c.  $5.4 \div 9$
- Divide a decimal by a single-digit whole number.
  - *Solve the following. How does place value help you divide?*
    - a.  $7.2 \div 3$
    - b.  $9.6 \div 4$
    - c.  $8.4 \div 2$
- Divide a decimal by a single-digit whole number that requires decomposition in the smallest place.
  - *Solve and explain how you decomposed the number.*
    - a.  $5.3 \div 2$
    - b.  $7.5 \div 4$
    - c.  $6.1 \div 3$
- Divide a decimal by a two-digit whole number.
  - *Solve the following. What strategy did you use?*
    - a.  $8.4 \div 12$
    - b.  $9.6 \div 24$
    - c.  $7.2 \div 18$
- Divide a decimal by a two-digit whole number that requires decomposition in the smallest place.
  - *Solve and explain your steps. Where did you need to decompose?*
    - a.  $6.5 \div 13$
    - b.  $7.8 \div 12$
    - c.  $9.1 \div 14$
- Divide a whole number or a decimal by 1 tenth or 1 hundredth.
  - *Predict and then solve. What happens to the number? Why?*
    - a.  $4 \div 0.1$
    - b.  $6.3 \div 0.1$
    - c.  $2.5 \div 0.01$
- Divide a whole number or a decimal by a decimal in cases that involve basic facts. Estimate quotients with decimal divisors by rounding numbers to compatible numbers.
  - *Estimate and then solve. Is your estimate close? Why?*
    - a.  $3.6 \div 0.6$
    - b.  $4.8 \div 0.8$
    - c.  $2.4 \div 0.3$
- Divide a whole number or a decimal by a decimal.
  - *Solve the following. How does changing the divisor help you solve?*
    - a.  $5.4 \div 0.9$
    - b.  $6.3 \div 0.7$
    - c.  $7.2 \div 0.6$

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- Divide decimals in all cases, seeing the general pattern for the placement of the decimal point in the quotient.
  - *Solve and look for a pattern. What do you notice about the quotient?*
    - a.  $3.6 \div 0.6$
    - b.  $3.6 \div 0.06$
    - c.  $3.6 \div 6$
- Solve real-world problems that require interpretation of the remainder involving all possible cases, including further decomposition into a decimal.
  - *Solve and explain what the remainder means in context. You have 5.5 miles of ribbon and need pieces that are 2 miles long. How many pieces can you make? What happens to the leftover?*
- Solve real-world problems involving multiplication and division with decimals.
  - *Solve and explain your thinking. Which operation did you use and why? A student buys 3 notebooks that cost \$2.75 each. How much do they spend??*
- Express measurements in a whole number of larger units or mixed units in terms of a smaller unit.
  - *Convert the following. How do you know your answer is reasonable?*
    - a.  $3\text{ m} = \underline{\hspace{1cm}}\text{ cm}$
    - b.  $2.5\text{ kg} = \underline{\hspace{1cm}}\text{ g}$
- Express measurements in a fractional or decimal number of larger units in terms of a smaller unit.
  - *Convert and explain your thinking.*
    - a.  $0.75\text{ m} = \underline{\hspace{1cm}}\text{ cm}$
    - b.  $1.2\text{ L} = \underline{\hspace{1cm}}\text{ mL}$
- Express measurements in a whole number of smaller units in terms of a larger unit.
  - *Convert the following. What operation did you use?*
    - a.  $500\text{ cm} = \underline{\hspace{1cm}}\text{ m}$
    - b.  $3,000\text{ g} = \underline{\hspace{1cm}}\text{ kg}$
- Express measurements in a fractional or decimal number of smaller units in terms of a larger unit.
  - *Convert and explain.*
    - a.  $250\text{ cm} = \underline{\hspace{1cm}}\text{ m}$
    - b.  $750\text{ mL} = \underline{\hspace{1cm}}\text{ L}$
- Solve real-world problems involving measurement conversions.
  - *Solve and explain your reasoning. A water bottle holds 1.5 liters. How many milliliters is that? If you drink 250 mL, how much remains?*

### 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

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#### 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

#### Assessments

##### **FORMATIVE ASSESSMENTS:**

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

##### **SUMMATIVE ASSESSMENTS:**

- Quiz: Multiplying and Dividing Decimals and Measurement Conversion (EU1, EU3)
- IAB
- Unit Task: “Camp Supply Trading Post” Performance Task (EU1, EU2 and EU3)

#### Unit Task

**Unit Task Name:** “Camp Supply Trading Post” Performance Task

**Description:** Upon completion of the unit students apply their understanding of decimal operations, numerical expressions, and measurement conversions to plan and run a “Camp Supply Trading Post” event. Students will determine supply pricing and setup, packing and budling supplies, measurement conversions for supplies, and earnings and profit tracking as they sell survival items like trail mix, sunscreen packs, rope bundles, or first-aid kits.

**Evaluation:** Teacher’s Scoring Guide

#### Unit Resources

- Google Classroom
- Pear Assessment
- Math In Focus
- Math Antics
- State Common Core Standards Transition Tasks
- Match Fishtank

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- Worksheets
- Individual White boards
- Interactive notebook
- Laptops
- SBAC Prep Online