

Unit 2: Fractions and Decimals

Content Area: **Mathematics**
Course(s):
Time Period: **Generic Time Period**
Length: **8 weeks**
Status: **Published**

Standards

CRP.K-12.CRP2	Apply appropriate academic and technical skills.
MA.4.4.NF.C.6	Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as $\frac{62}{100}$; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
CRP.K-12.CRP2.1	Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
MA.4.4.NF.C.7	Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual model.
MA.4.4.NF.B.4c	Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat $\frac{3}{8}$ of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?
CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
TECH.8.1.5	All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.
TECH.8.1.5.C	Students use digital media and environments to communicate and work collaboratively, including at a distance, to support individual learning and contribute to the learning of others.
TECH.8.1.5.E	Students apply digital tools to gather, evaluate, and use information.
TECH.8.1.5.F	Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.
TECH.8.2.5	All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.
TECH.8.2.5.E	Computational thinking builds and enhances problem solving, allowing students to move beyond using knowledge to creating knowledge.
MA.4.4.NF.C	Understand decimal notation for fractions, and compare decimal fractions.
LA.4.W.4.10	Write routinely over extended time frames (time for research, reflection, metacognition/self-correction and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

MA.4.4.MD	Measurement and Data
CRP.K-12.CRP1.1	Career-ready individuals understand the obligations and responsibilities of being a member of a community, and they demonstrate this understanding every day through their interactions with others. They are conscientious of the impacts of their decisions on others and the environment around them. They think about the near-term and long-term consequences of their actions and seek to act in ways that contribute to the betterment of their teams, families, community and workplace. They are reliable and consistent in going beyond the minimum expectation and in participating in activities that serve the greater good.
LA.4.RI.4.4	Determine the meaning of general academic and domain-specific words or phrases in a text relevant to a grade 4 topic or subject area.
CRP.K-12.CRP8.1	Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.
MA.4.4.MD.A	Solve problems involving measurement and conversion of measurements from a larger unit to a smaller unit.
PFL.9.1.4.B.5	Identify ways to earn and save.
LA.4.SL.4.1	Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 4 topics and texts, building on others' ideas and expressing their own clearly.
LA.4.SL.4.1.A	Explicitly draw on previously read text or material and other information known about the topic to explore ideas under discussion.
CRP.K-12.CRP11	Use technology to enhance productivity.
LA.4.SL.4.1.B	Follow agreed-upon rules for discussions and carry out assigned roles.
LA.4.SL.4.1.C	Pose and respond to specific questions to clarify or follow up on information, and make comments that contribute to the discussion and link to the remarks of others.
MA.4.4.NF	Number and Operations—Fractions
LA.4.L.4.3	Use knowledge of language and its conventions when writing, speaking, reading, or listening.
LA.4.SL.4.1.D	Review the key ideas expressed and explain their own ideas and understanding in light of the discussion.
CRP.K-12.CRP11.1	Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks—personal and organizational—of technology applications, and they take actions to prevent or mitigate these risks.
MA.4.4.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 expressing 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.
CRP.K-12.CRP4.1	Career-ready individuals communicate thoughts, ideas, and action plans with clarity, whether using written, verbal, and/or visual methods. They communicate in the workplace with clarity and purpose to make maximum use of their own and

others' time. They are excellent writers; they master conventions, word choice, and organization, and use effective tone and presentation skills to articulate ideas. They are skilled at interacting with others; they are active listeners and speak clearly and with purpose. Career-ready individuals think about the audience for their communication and prepare accordingly to ensure the desired outcome.

CAEP.9.2.4.A.4

Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

LA.4.SL.4.3

Identify the reasons and evidence a speaker provides to support particular points.

MA.4.4.MD.A.3

Apply the area and perimeter formulas for rectangles in real world and mathematical problems.

LA.4.L.4.4

Determine or clarify the meaning of unknown and multiple-meaning words and phrases based on grade 4 reading and content, choosing flexibly from a range of strategies.

CRP.K-12.CRP8

Utilize critical thinking to make sense of problems and persevere in solving them.

LA.4.SL.4.6

Differentiate between contexts that call for formal English (e.g., presenting ideas) and situations where informal discourse is appropriate (e.g., small-group discussion); use formal English when appropriate to task and situation.

MA.4.4.NF.B.3

Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.

MA.4.4.NF.B.3a

Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

LA.4.L.4.1

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

MA.4.4.NF.B.3b

Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model.

Examples: $3/8 = 1/8 + 1/8 + 1/8$; $3/8 = 1/8 + 2/8$; $2 \frac{1}{8} = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8$.

MA.4.4.NF.B.3c

Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.

MA.4.4.NF.B.3d

Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

MA.4.4.NF.B.4

Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

MA.4.4.NF.B.4a

Understand a fraction a/b as a multiple of $1/b$.

MA.4.4.NF.C.5

Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.

MA.4.4.NF.B.4b

Understand a multiple of a/b as a multiple of $1/b$, and use this understanding to multiply a fraction by a whole number.

CRP.K-12.CRP1

Act as a responsible and contributing citizen and employee.

CRP.K-12.CRP6

Demonstrate creativity and innovation.

CRP.K-12.CRP6.1

Career-ready individuals regularly think of ideas that solve problems in new and different ways, and they contribute those ideas in a useful and productive manner to improve their organization. They can consider unconventional ideas and suggestions as solutions to issues, tasks or problems, and they discern which ideas and suggestions will add greatest value. They seek new methods, practices, and

ideas from a variety of sources and seek to apply those ideas to their own workplace. They take action on their ideas and understand how to bring innovation to an organization.

Learning Objectives

Unit Focus:

- Extend understanding of fraction equivalence and ordering.
- Build fractions from unit fractions by applying and extending previous understandings of operations.
- Understand decimal notation for fractions, and compare decimal fractions.

Critical Area:

Developing an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers.

Chapter Six: Lesson Learning Objectives:

- 6.1 Use models to show equivalent fractions.
- 6.2 Use multiplication to generate equivalent fractions.
- 6.3 Write and identify equivalent fractions in simplest form.
- 6.4 Use equivalent fractions to represent a pair of fractions as fractions with a common denominator.
- 6.5 Use the strategy make a table to solve problems using equivalent fractions.
- 6.6 Compare fractions using benchmarks.
- 6.7 Compare fractions by first writing them as fractions with a common numerator or common denominator.
- 6.8 Compare and order fractions.

Chapter Seven: Lesson Learning Objectives

- 7.1 Understand that to add or subtract fractions they must refer to parts of the same whole.
- 7.2 Decompose a fraction by writing it as a sum of fractions with the same denominators.
- 7.3 Use models to represent and find sums involving fractions.

- 7.4 Use models to represent and find differences involving fractions.
- 7.5 Solve word problems involving addition and subtraction with fractions.
- 7.6 Write fractions greater than 1 as mixed numbers and write mixed numbers as fractions greater than 1.
- 7.7 Add and subtract mixed numbers.
- 7.8 Rename mixed numbers to subtract.
- 7.9 Use the properties of addition to add fractions.
- 7.10 Use the strategy *act it out* to solve multistep fraction problems.

Chapter Eight: Lesson Learning Objectives

- 8.1 Write a fraction as a product of a whole number and a unit fraction.
- 8.2 Write a product of a whole number and a fraction as a product of a whole number and a unit fraction.
- 8.3 Use a model to multiply a fraction by a whole number.
- 8.4 Multiply a fraction by a whole number to solve a problem.
- 8.5 Problem Solving - Use the strategy *draw a diagram* to solve comparison problems with fractions.

Chapter Nine: Lesson Learning Objectives

- 9.1 Record tenths as fractions and as decimals.
- 9.2 Record hundredths as fractions and as decimals.
- 9.3 Record tenths and hundredths as fractions and decimals.
- 9.4 Translate among representations of fractions, decimals, and money.
- 9.5 Solve problems by using the strategy *act it out*.
- 9.6 Add fractions when the denominators are 10 and 100.
- 9.7 Compare decimals to hundredths by reasoning about their size.

Essential Questions

Chapter Six Essential Question

What strategies can you use to compare fractions and write equivalent fractions?

Lesson Essential Questions:

- 6.1 How can you use models to show equivalent fractions?
- 6.2 How can you use multiplication to find equivalent fractions?
- 6.3 How can you write a fraction as an equivalent fraction in simplest form?
- 6.4 How can you write a pair of fractions as fractions with a common denominator?
- 6.5 How can you use the strategy make a table to solve problems using equivalent fractions?
- 6.6 How can you use benchmarks to compare fractions?

Chapter Seven Essential Question

How do you add or subtract fractions that have the same denominator?

Lesson Essential Questions

- 7.1 When can you add or subtract parts of a whole?
- 7.2 How can you write a fraction as a sum of fractions with the same denominator?
- 7.3 How can you add fractions with like denominators using models?
- 7.4 How can you subtract fractions with like denominators using models?
- 7.5 How can you add and subtract fractions with like denominators?
- 7.6 How can you rename mixed numbers as fractions greater than 1 and rename fractions greater than 1 as mixed numbers?

- 7.7 How can you add and subtract mixed numbers with like denominators?
- 7.8 How can you rename a mixed number to help you subtract?
- 7.9 How can you add fractions with like denominators using the properties of addition?
- 7.10 How can you use the strategy *act it out* to solve multistep problems with fractions?

Chapter Eight Essential Question

How do you multiply fractions by whole numbers?

Lesson Essential Questions

- 8.1 How can you write a fraction as a product of a whole number and a unit fraction?
- 8.2 How can you write a product of a whole number and a fraction as a product of a whole number and a unit fraction?
- 8.3 How can you use a model to multiply a fraction by a whole number?
- 8.4 How can you multiply a fraction by a whole number to solve a problem?
- 8.5 How can you use the strategy *draw a diagram* to solve comparison problems with fractions?

Chapter Nine Essential Question

How can you record decimal notation for fractions, and compare decimal fractions?

Lesson Essential Questions

- 9.1 How can you record tenths as fractions and decimals?
- 9.2 How can you record hundredths as fractions and decimals?
- 9.3 How can you record tenths and hundredths as fractions and decimals?
- 9.4 How can you relate fractions, decimals, and money?

9.5 How can you use the strategy *act it out* to solve problems that use money?

9.6 How can you add fractions when the denominators are 10 and 100?

9.7 How can you compare decimals?

Materials

Go Math Digital Resources:

iStudent Edition

eTeacher Edition

Personal Math Trainer

Math on the Spot Video

Real World Video

Animated Math Models

iTools

HMH Mega Math

iPad

Computer

Go Math Print Resources:

Student Edition

Practice and Homework (in the Student Edition)

Reteach (in the Chapter Resources)

Enrich (in the Chapter Resources)

Grab-and-Go Centers Kit

Achieve the Core:

<http://achievethecore.org/page/2853/go-math-k-5-guidance-documents>

Activities

Building Fractions and Decimal Notations

Unit Project: Building Custom Guitars

Chapter Six: Fraction Equivalence and Comparison

Vocabulary Game: Going to San Francisco

Lesson 1: Investigate - Equivalent Fractions

Lesson 2: Generate Equivalent Fractions

Lesson 3: Simplest Form

Lesson 4: Common Denominators

Lesson 5: Problem Solving - Find Equivalent Fractions

Mid-Chapter Checkpoint

Lesson 6: Compare Fractions Using Benchmarks

Lesson 7: Compare Fractions

Lesson 8: Compare and Order Fractions

Chapter Seven: Add and Subtract Fractions

Vocabulary Game: Bingo

Lesson 1: Investigate - Add and Subtract Parts of a Whole

Lesson 2: Write Fractions as Sums

Lesson 3: Add Fractions Using Models

Lesson 4: Subtract Fractions Using Models

Lesson 5: Add and Subtract Fractions

Mid-Chapter Checkpoint

Lesson 6: Rename Fractions and Mixed Numbers

Lesson 7: Add and Subtract Mixed Numbers

Lesson 8: Subtraction with Renaming

Lesson 9: Algebra - Fractions and Properties of Addition

Lesson 10: Problem Solving - Multistep Fraction Problems

Chapter Eight: Multiply Fractions by Whole Numbers

Vocabulary Game: Pick It

Lesson 1: Multiples of Unit Fractions

Lesson 2: Multiples of Fractions

Mid-Chapter Checkpoint

Lesson 3: Multiply a Fraction by a Whole Number Using Models

Lesson 4: Multiply a Fraction or Mixed Number by a Whole Number

Lesson 5: Problem Solving - Comparison Problems with Fractions

Chapter Nine: Relate Fractions and Decimals

Vocabulary Game: Match Up

Lesson 1: Relate Tenths and Decimals

Lesson 2: Relate Hundredths and Decimals

Lesson 3: Equivalent Fractions and Decimals

Lesson 4: Relate Fractions, Decimals, and Money

Lesson 5: Problem Solving - Money

Mid-Chapter Checkpoint

Lesson 6: Add Fractional Parts of 10 and 100

Lesson 7: Compare Decimals

Other Activities:

[4.NF.A.1 Explaining Fraction Equivalence with Pictures](#)

[4.NF.A.1 Fractions and Rectangles](#)

[4.NF.A.2 Comparing Fractions Using Benchmarks Game](#)

[4.NF.A.2 Doubling Numerators and Denominators](#)

[4.NF.B.3a Comparing Sums of Unit Fractions](#)

[4.NF.B.3b making 22 Seventeenths in Different Ways](#)

[4.NF.B.3c Cynthia's Perfect Punch](#)

[4.NF.B.3c Peaches](#)

[4.MD.B.4 Button Diameters](#)

[4.NF.B.4 Extending Multiplication From Whole Numbers to Fractions](#)

[4.NF.B.4c Sugar in six cans of soda](#)

[4.NF.C.5 Adding Tenths and Hundredths](#)

[4.NF.C.6 Dimes and Pennies](#)

[4.NF.C.6 Expanded Fractions and Decimals](#)

[4.NF.C.7 Using Place Value](#)

Assessment

MAP Assessment

Diagnostic:

Show What You Know

Digital Personal Math Trainer

Formative:

Lesson Quick Check

Mid-Chapter Checkpoint

Digital Personal Math Trainer

- Assessment Animation
- Assessment Video

Summative:

Chapter Review/Test

Chapter Test

Performance Assessment Task

Digital Personal Math Trainer

Fact Fluency

Go Math Resources for Fact Fluency

- Fluency Standard Lessons (Student Edition)
- Fluency Builder (Teacher Edition)
- Strategies and Practice for Skills and Facts Fluency - Intermediate G3-6
- HMH Mega Math
- Personal Math Trainer: Standards Quizzes
- Animated Math Models

Other Resources for Fact Fluency

- Mad Minute
- Rocket Math
- FASTT Math
- Flash Cards

MA.4.4.NBT.B.4

Fluently add and subtract multi-digit whole numbers using the standard algorithm.

Accommodations and Modifications

Interactive Student Edition

Personal Math Trainer (adaptive assessment and intervention system)

Leveled Quizzes, Tests, and Performance Tasks

Grab & Go Differentiated Centers

Intensive Intervention Resource

Strategic Intervention Resource

Reteach Activities

RTI Tiered Resources and Activities

Math on the Spot Videos

Others/ Notes

Standards for Mathematical Practice

- MP.1 Make sense of problems and persevere in solving them.
- MP.2 Reason abstractly and quantitatively.
- MP.3 Construct viable arguments and critique the reasoning of others.
- MP.4 Model with mathematics.
- MP.5 Use appropriate tools strategically.
- MP.6 Attend to precision.
- MP.7 Look for and make use of structure.
- MP.8 Look for and express regularity in repeated reasoning.