

Unit 4: Fraction Equivalence and Ordering
4th Grade Math
35 Class Meetings

Revised September 2025

Essential Questions

- How can we use benchmark fractions (like $\frac{1}{2}$) to help compare and order fractions?
- How do fractions relate to whole numbers on a number line?
- Why is understanding fraction equivalence important in real-life situations?

Enduring Understandings with Unit Goals

EU 1: Every whole number has factors, and some factors are shared by multiple numbers.

- Determine that every whole number has factors, and some factors are shared by multiple numbers.
- Understand that multiples of a number follow a predictable pattern and extend infinitely.
- Recognize that prime numbers have exactly two factors: 1 and themselves, while composite numbers have more than two factors.
- Discover that common factors and multiples help in problem-solving, including simplifying fractions and finding common denominators.
- Understand that factors and multiples help in recognizing number relationships and patterns in multiplication and division.

EU 2: Fractions are equivalent if they represent the same value, even if they have different numerators and denominators.

- Discover that a fraction represents a part of a whole, and different fractions can represent the same amount.
- Understand that multiplication and division can be used to generate equivalent fractions.
- Utilize visual models, such as number lines and fraction bars, to help understand and compare equivalent fractions.
- Recognize that equivalent fractions are important for comparing, ordering, and operating with fractions in real-world situations.

EU 3: Fractions can be compared and ordered using visual models, number lines, and common denominators.

- Understand that equivalent fractions represent the same value, even if they have different numerators and denominators.
- Utilize benchmark fractions (such as $\frac{1}{2}$) help us estimate and compare fractions.
- Understand that fraction equivalence and comparison help in real-world problem-solving situations.
- Determine that fractions are numbers that can be located on a number line, just like whole numbers.

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Standards

Common Core State Standards:

- **CCSS.4.NF.A:** Extend understanding of fraction equivalence and ordering.
- **CCSS.4.NF.A.1:** Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.
- **CCSS.4.NF.A.2:** Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing them to a benchmark fraction such as $1/2$. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols $>$, $=$, or $<$, and justify the conclusions, e.g., by using a visual fraction model.
- **CCSS.4.OA.B.4:** Find all factor pairs for a whole number in the range 1—100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1—100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1—100 is prime or composite.
- **CCSS.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.
- **CCSS.4.OA.A.1:** Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

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 Content Overview

- **Factors and Multiples**
 - Identify factors and multiples of whole numbers.
 - Determine if a number is prime or composite and explain why.
 - Find the greatest common factor (GCF) and least common multiple (LCM) of two numbers.
 - Use factors and multiples to solve real-world problems, such as grouping objects or organizing schedules.
 - Recognize and apply factor pairs to understand multiplication and division relationships.

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- **Equivalent Fractions**
 - Explain why two fractions are equivalent using visual models and mathematical reasoning.
 - Generate equivalent fractions by multiplying or dividing both the numerator and denominator by the same number.
 - Use number lines and fraction models to compare and identify equivalent fractions.
 - Recognize and justify equivalent fractions in real-world contexts.
 - Apply knowledge of equivalent fractions to simplify fractions and solve problems.
- **Comparing and Ordering Fractions**
 - Identify and create equivalent fractions using models, number lines, and multiplication/division.
 - Compare two fractions with different numerators and denominators using strategies such as finding a common denominator or comparing them to benchmark fractions.
 - Order fractions from least to greatest or greatest to least using number lines and visual models.
 - Justify their reasoning when comparing and ordering fractions using mathematical vocabulary and models.
 - Apply fraction comparison and ordering skills to solve real-world problems.

Vocabulary and Key Terms: fraction, numerator, denominator, equivalent fractions, common denominator, least common denominator (LCD), greatest common factor (GCF), benchmark fractions, unit fraction, simplify (reduce) fractions, improper fraction, mixed number, compare fractions, order fractions, number line, greater than ($>$), less than ($<$), equal to ($=$), denominator strategy, numerator strategy, fraction strip/bar model

Interdisciplinary Connection:

- ELA

Daily Learning Objectives with *TWPS*

Students will be able to...

- Understand the concept of fractions as parts of a whole and identify the numerator and denominator. **
 - *Which of the following fractions is closer to 1: $\frac{4}{5}$ or $\frac{5}{6}$? How can you tell?*
 - *How can you use your knowledge of equivalent fractions to solve a real-world problem, like dividing a pizza among friends?*
- Use fraction models (e.g., circles, rectangles) to represent fractions and understand how to partition shapes into equal parts.
 - *How can you explain why two fractions are equivalent to someone who has never seen fractions before?*
- Identify equivalent fractions using visual models.
 - *If $\frac{1}{2}$ is greater than $\frac{1}{4}$, does it make sense that $\frac{3}{8}$ is greater than $\frac{2}{4}$? Why or why not?*
- Find and represent equivalent fractions on a number line.
 - *Which would be more useful in a real-world situation: using equivalent fractions to divide something into smaller pieces or using benchmark fractions to estimate size?*
- Simplify fractions by finding the greatest common factor (GCF) of the numerator and denominator.
 - *If a fraction is simplified to its smallest form, does it always make it easier to compare with other fractions? Explain why or why not.*

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- Simplify fractions by dividing both the numerator and denominator by their GCF.
 - *Should we always simplify fractions to their simplest form before comparing them? Why?*
- Identify when fractions have the same denominator and use this concept to compare fractions.
 - *If you are comparing $\frac{3}{4}$ and $\frac{7}{8}$, is it better to find a common denominator or estimate by comparing to a benchmark fraction?*
- Generate equivalent fractions by multiplying or dividing both the numerator and denominator by the same number.
 - *Which is larger: $\frac{5}{6}$ or $\frac{9}{10}$? Show your reasoning and discuss how you arrived at the answer.*
- Create equivalent fractions by multiplying both the numerator and denominator by the same number.
 - *Each of our two friends have different ways of simplifying fractions: one divides the numerator and denominator by their GCF, and the other multiplies to make equivalent fractions with a common denominator. Which method is more efficient for comparison and why?*
- Create equivalent fractions by dividing both the numerator and denominator by the same number.
 - *Are equivalent fractions just different ways to write the same number, or do they have practical uses in real life?*
- Use benchmark fractions ($\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$) to estimate and compare other fractions.
 - *You have $\frac{2}{5}$ of a pizza and your friend has $\frac{4}{10}$ of a pizza. Who has more pizza?*
- Compare fractions that have the same denominator using visual models and number lines.
 - *Which is more important when comparing fractions: the numerator or the denominator? Why?*
- Compare fractions with the same numerator using visual models and number lines.
 - *Is it easier to compare fractions with the same numerator or the same denominator? Why?*
- Compare fractions with different denominators by finding a common denominator. **
 - *Is it better to compare fractions by finding a common denominator or by using benchmark fractions like $\frac{1}{2}$? Why?*
 - *If you were asked to explain how to compare fractions with different denominators to a classmate, what steps would you give them?*
- Order fractions with like denominators from least to greatest using visual models and number lines.
 - *How do you decide which fractions to compare first when ordering a set of fractions?*
- Order fractions with like numerators from greatest to least using visual models and number lines.
 - *If you have to order these fractions: $\frac{3}{8}$, $\frac{5}{8}$, and $\frac{1}{2}$, how can you justify the correct order?*
- Order fractions with different denominators by finding a common denominator.
 - *Order these fractions from least to greatest: $\frac{1}{2}$, $\frac{3}{4}$, $\frac{2}{3}$, $\frac{5}{6}$.*
- Recognize and convert improper fractions to mixed numbers and vice versa.
 - *Do improper fractions or mixed numbers make more sense when comparing or ordering fractions? Why?*
- Order mixed numbers from least to greatest using number lines and visual models.
 - *How would you explain to someone why $\frac{3}{4}$ is greater than $\frac{2}{3}$, using models or number lines?*
- Compare and order fractions with unlike denominators by finding equivalent fractions with a common denominator.

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- *How would you use the strategy of finding a common denominator to order fractions that seem hard to compare at first?*
- Solve word problems involving the comparison of fractions. **
 - *You are making cookies and need $\frac{3}{4}$ of a cup of sugar. If you only have a $\frac{1}{4}$ measuring cup, how can you find out how many times you need to fill it?*
 - *If you are building a fence and need to cut it into sections, how would you decide which fractions to use when dividing the fence into equal parts?*

Instructional Strategies/Differentiated Instruction

- Whole group instruction
- Paragraph frames and sentence starters
- Teacher modeling
- Think-write-pair-share and small-group discussions
- Graphic organizers
- Accountable talk
- Homework
- Word walls with visuals
- Small group instruction
- Visual exemplars with teacher and student critiques
- Text and video chunking
- Spiraling back to guiding questions

EL Differentiation Strategies

- Word Banks and Word Walls with visuals
- TWPS (Think, write, pair, share)
- Pre-reading strategies
- 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 -- “School Garden” Performance Task
 - Teacher’s rubric/scoring guide

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SUMMATIVE ASSESSMENTS:

- Quiz: Factors and Multiples, Equivalent Fractions, Comparing and Ordering Fractions (EU1, EU2, and EU3)
- IAB
- Unit Task: “School Garden” Performance Task (EU1, EU2 and EU3)

Unit Task

Unit Task Name: “School Garden” Performance Task

Description: Each student is responsible for designing a new school garden. The garden will have different sections for flowers, vegetables, and paths. Each section needs to be divided into specific fractional areas, and students will need to compare, order, and find equivalent fractions to make sure the areas add up correctly.

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