4 Math Unit 07: Fraction Equivalence, Adding & Subtracting & Multiplying

Content Area: **Mathematics**
Course(s):
Time Period: **February**
Length: **7 Weeks**
Status: **Published**

Unit Overview

Students can use area models and number line diagrams to reason about equivalence. They see that the numerical process of multiplying the
numerator and denominator of a fraction by the same number, n, corresponds physically to partitioning each unit fraction piece into n smaller
equal pieces. The whole is then partitioned into n times as many pieces, and there are n times as many smaller unit fraction pieces as in the
original fraction. This argument, once understood for a range of examples, can be seen as a general argument, working directly from the Grade 3
understanding of a fraction as a point on the number line.

The meaning of addition is the same for both fractions and whole numbers, even though algorithms for calculating their sums can be
different value. This simple understanding of addition as putting together allows students to see in a new light the way fractions are built up from
unit.

Previously in Grade 3, students learned that 37 can be represented as the number of objects in 3 groups of 7 objects. Grade 4 students apply
this understanding to fractions. In general, they see a fraction as the numerator times the unit fraction with the same denominator. The same
thinking, based on the analogy between fractions and whole numbers, allows students to give meaning to the product of a whole number and a
fraction.

- What are some ways to name the same part of a whole?
- How can you compare fractions with unlike denominators?
- How is adding and subtracting fractions like adding and subtracting whole numbers?
- How do you add and subtract fractions?
- How is a non-unit fraction a multiple of a unit fraction?
- How can understanding the relationship between unit and non-unit fractions be used to multiply a fraction by a whole number?
- What strategies can you use to solve word problems involving multiplication of fractions by whole numbers?

Students will be able to...

- find equivalent fractions and order fractions
- add and subtract fractions and mixed numbers
- multiply a fraction by a whole number and solve word problems involving multiplication of fractions by whole numbers

Standards

MA.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.
MA.4.NF.A.1	Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × 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.
MA.4.NF.A.2	Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing 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.
MA.4.NF.B.3	Understand a fraction a/b with $a > 1$ as a sum of fractions $1/b$.
MA.4.NF.B.4	Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.
MA.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.

Materials

- EnVision Math
- 8-1 Equivalent Fractions: Area Models
- 8-2 Equivalent Fractions: Number Lines
- 8-3 Generate Equivalent Fractions: Multiplication
- 8-4 Generate Equivalent Fractions: Division
- 8-5 Use Benchmarks to Compare Fractions
- 8-6 Compare Fractions
- 8-7 Math Practices and Problem Solving: Construct Arguments
- 9-1 Model Addition of Fractions
- 9-2 Decompose Fractions
- 9-3 Add Fractions with Like Denominators
- 9-4 Model Subtraction of Fractions
- 9-5 Subtract Fractions with Like Denominators
- 9-6 Add and Subtract Fractions with Like Denominators
- 9-7 Estimate Fraction Sums and Differences
- 9-8 Model Addition and Subtraction of Mixed Numbers
- 9-9 Add Mixed Numbers
- 9-10 Subtract Mixed Numbers
- 9-11 Math Practices and Problem Solving: Model with Math
- 10-1 Fractions as Multiples of Unit Fractions: Use Models
- 10-2 Multiply a Fraction by a Whole Number: Use Models
- 10-3 Multiply a Fraction by a Whole Number: Use Symbols
- 10-4 Multiply a Whole Number by a Mixed Number
- 10-5 Solve Time Problems
- 10-6 Math Practices and Problem Solving: Model with Math

ST Math

- Happy Numbers
- 3 Act Lessons
- Building Fact Fluency Kit
- Brainingcamp Manipulatives
- Nearpod Lessons
- Brainpop Resources
- Math Diagnosis and Intervention System
- Online Resources

Technology

- 8.1.5.A.1,2,4 (solve problems, word processing, databases, spreadsheets)
- 8.1.5.F.1 (digital tools to support scientific finding)
- 8.2.5.C.1,2,3 (solve problems, troubleshoot repair tools)

Assessment

Formative Assessment

- Teacher Observation
- Daily Quick Check
- Quizzes
- Exit Tickets

Summative Assessment

- Topic Tests
- Benchmark Tests
- Alternative Assessments: Performance Tasks & Projects

Accommodations & Modifications

Special Education

- Follow IEP Plan which may contain some of the following examples…
- In class/pull out support with special ed teacher
- Additional time during intervention time

- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Limit number of questions
- Scribe
- Manipulatives
- Calculators
- Reteach pages
- Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System
- Another look homework video
- Practice buddy

504

- In class/pull out support with special ed teacher Additional time during intervention time
- Preferred seating
- Questions read aloud
- Extended time for completing tasks Graphic organizers
- Vocabulary support Mnemonic devices
- Songs/videos to reinforce concepts Limit number of questions
- Scribe Manipulatives Calculators Reteach pages Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System Another look homework video
- Practice buddy

ELL

- Translation device/dictionary
- In class/pull out support with ESL teacher
- Preferred seating
- Questions read aloud
- Extended time for completing tasks
- Graphic organizers
- Vocabulary support
- Mnemonic devices
- Songs/videos to reinforce concepts
- Manipulatives
- Math Diagnosis & Intervention System

At-risk of Failure

- Additional time during intervention time
- Questions read aloud
- Graphic organizers
- Vocabulary support
- Mnemonic devices

- Songs/videos to reinforce concepts
- Manipulatives
- Calculators
- Reteach pages
- Leveled homework
- Lesson intervention activities
- Math Diagnosis & Intervention System
- Another look homework video
- Practice buddy

Gifted & Talented

- Independent projects
- Enrichment pages
- Online games
- Leveled Homework
- Extension Activities
- Today's Challenge

Interdisciplinary Connections

Topic 1 Math and Science Project - Using different presentations tools, students will collect different types of paper. Talk about the uses of
paper. Tell how strong each type of paper is.Tell how the paper feels. Tell if the paper can soak up water.

ELA:
NJSLSA.R10. Read and comprehend complex literary and informational texts independently and proficiently with scaffolding as needed.

Science:
3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

21st Century Life Literacies & Key Skills

Critical Thinking and Problem Solving:

Problem-solving activities starting with the lesson "Solve and Share" and ending with higher order thinking questions that utilize the mathematical practices

Communication and Collaboration:

Throughout the lesson, students are provided with opportunities to discuss their ideas as they investigate mathematical

concepts.

Creativity:

Students have opportunities to express their creativity by solving problems their own way, participating in performance tasks, and group projects.

Technology:

Use of iPads, instructional apps, lab materials embedded in lessons. Programs such as BrainPop,Math Reflex, Google Slides are used to support instruction.

Career Ready Practices

- CRP1. Act as a responsible and contributing citizen and employee.
- CRP2. Apply appropriate academic and technical skills.
- CRP4. Communicate clearly and effectively and with reason.
- CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
- CRP12. Work productively in teams while using cultural global competence.