Unit 04: Operations with Fractions

Content Area: **Math**
Course(s):
Time Period: **Full Year**
Length: **5 weeks**
Status: **Published**

General Overview, Course Description or Course Philosophy

In this unit, students will develop an understanding of the four basic arithmetic opertions with fractions and mixed numbers. They will use models and diagrams to help solve real-word mathematical problems.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

Objectives:

- Add, subtract, multiply, and divide fractions

Essential Questions:

- How do we solve real world application fraction problems?

Enduring Understandings:

- Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
- Computational fluency requires efficient, accurate and flexible methods for computing.

CONTENT AREA STANDARDS

6.RP

A. Understand ratio concepts and use ratio reasoning to solve problems

6.NS

A. Apply and extend previous understandings of multiplication and division to divide fractions by fractions

B. Compute fluently with multi-digit numbers & find common factors & multiples

C. Apply and extend previous understandings of numbers to the system of rational numbers

6.EE

A. Apply and extend previous understandings of arithmetic to algebraic expressions

B. Reason about and solve one-variable equations and inequalities

C. Represent and analyze quantitative relationships between dependent and independent variables

MA.K-12.1	Make sense of problems and persevere in solving them.
MA.K-12.2	Reason abstractly and quantitatively.
MA.K-12.3	Construct viable arguments and critique the reasoning of others.
MA.K-12.4	Model with mathematics.
MA.K-12.5	Use appropriate tools strategically.
MA.K-12.6	Attend to precision.
MA.K-12.7	Look for and make use of structure.
MA.K-12.8	Look for and express regularity in repeated reasoning.
MA.6.NS.A.1	Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem.
MA.6.NS.B.3	Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.
MA.6.NS.B.4	Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1–100 with a common factor as a multiple of a sum of two whole numbers with no common factor.
MA.6.EE.A.2	Write, read, and evaluate expressions in which letters stand for numbers.
MA.6.EE.A.2a	Write expressions that record operations with numbers and with letters standing for numbers.
MA.6.EE.A.2b	Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity.
MA.6.EE.A.2c	Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations).
MA.6.EE.A.3	Apply the properties of operations to generate equivalent expressions.

RELATED STANDARDS (Technology, 21st Century Life & Careers, ELA Companion Standards are Required)

9.1.8.RM.1: Determine criteria for deciding the amount of insurance protection needed. • 9.1.8.RM.2: Analyze the need for and value of different types of insurance and the impact of deductibles in protecting assets against loss

LA.K-12.NJSLSA.R10	Read and comprehend complex literary and informational texts independently and proficiently with scaffolding as needed.
LA.K-12.NJSLSA.SL1	Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

CS.K-12.3	Recognizing and Defining Computational Problems
CS.K-12.3.a	Identify complex, interdisciplinary, real-world problems that can be solved computationally.
CS.K-12.3.b	Decompose complex real-world problems into manageable sub-problems that could integrate existing solutions or procedures.
CS.K-12.3.c	Evaluate whether it is appropriate and feasible to solve a problem computationally.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.

STUDENT LEARNING TARGETS

Refer to the 'Declarative Knowledge' and 'Procedural Knowledge sections.

Declarative Knowledge

Students will understand that:

- Content specific vocabulary: algorithm, number sentence, underestimate, benchmark, overestimate, fact family, reciprocal

- Ways to model situations involving multiplication or division of fractions

Procedural Knowledge

Students will be able to:

- 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 of fractions with like denominators.
- Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators.
- Estimate mentally and assess the reasonableness of answers to word problems involving addition and subtraction.
- Interpret a fraction as division of the numerator by the denominator ($a/b = a \div b$).
- Compute products of fractions.
- Interpret multiplication as scaling (resizing) by explaining why multiplying a given number by a fraction results in a product greater than, less than, or equal to the given number.
- Solve real world problems involving multiplication of fractions and mixed numbers.
- Compute quotients of fractions.
- Solve word problems involving division of fractions by fractions.
- Interpret quotients of fractions.

EVIDENCE OF LEARNING

Refer to the 'Formative Assessments' and 'Summative Assessments' sections.

Formative Assessments

- Observations
- Classwork
- Homework Assignments
- Do Now Questions
- Exit Tickets
- Self Assessment Questions
- Proficiency Scale

Summative Assessments

- Quizzes

- Unit Assessments

- Graded Assignments

- Projects

RESOURCES (Instructional, Supplemental, Intervention Materials)

- *CMP3 Let's Be Rational*
- Savvas Realize (teacher and student resources)
- Additional Resources linked HERE
- Khan Academy
- Delta Math
- Illustrative Math Performance Tasks:

    - 6.NS.A.1 Making Hot Cocoa, Variation 1

    - 6.NS.A.1 How Much is in One Batch?

    - 6.NS.A.1 Baking Cookies

- o [6.NS.A.1 Running to School, Variation 3](#)

- o [6.NS.A.1 Traffic Jam](#)

- o [6.NS.A.1 How Many ___ in ___?](#)

- o [6.NS.A How Many Batches/What Fraction of a Batch?](#)

- [IXL](#)- Recommended Skills Practice
  - o J.3 Add & Subtract Fractions with Unlike Denominators
  - o J.6 Add & Subtract Mixed Numbers
  - o J.7 Add & Subtract Mixed Numbers: Word Problems
  - o K.6 Multiply Two Fractions
  - o K.13 Multiply Mixed Numbers
  - o K.14 Multiply Mixed Numbers: Word Problems
  - o L.5 Divide Fractions
  - o L.7 Divide Fractions & Mixed Numbers
  - o L.8 Divide Fractions & Mixed Numbers: Word Problems

INTERDISCIPLINARY CONNECTIONS
- Computations
- Financial/Economic/Business/Entrepreneurial Literacy

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS
See link to Accommodations & Modifications document in course folder.