

Unit 04: Operations with Fractions

Content Area: **TEMPLATE**
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 operations with fractions and mixed numbers. They will use models and diagrams to help solve real-world mathematical problems.

OBJECTIVES, ESSENTIAL QUESTIONS, ENDURING UNDERSTANDINGS

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

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-12.6	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	Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
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.5.NF.A.1	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 or difference of fractions with like denominators.

MA.5.NF.A.2	Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers.
MA.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.
MA.5.NF.B.4	Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.
MA.5.NF.B.5b	Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.
MA.5.NF.B.6	Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.

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

LA.K-12.NJSLSA.R1	Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.
LA.K-12.NJSLSA.SL4	Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.
CS.K-12.3	Recognizing and Defining Computational Problems
CS.K-12.5	Creating Computational Artifacts
CS.K-12.6	Testing and Refining Computational Artifacts
WRK.K-12.P.1	Act as a responsible and contributing community members and employee.
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

Declarative Knowledge

Students will understand:

- 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

Formative Assessments

- Observations/Checklists
- Classwork
- Do Now Questions/Exit Tickets
- Self Assessment Questions
- Illustrative Math Performance Task: [6.NS.A.1 Traffic Jam](#)
- IXL Skills Practice

Summative Assessments

- Portfolio Artifacts

Averages are based upon participation/preparation, classwork, and quizzes. Student marking period grades are either O (outstanding), S (satisfactory), or U (unsatisfactory).

RESOURCES (Instructional, Supplemental, Intervention Materials)

- *CMP3 Let's Be Rational*
- [Savvas Realize](#) (teacher and student resources)
- [Khan Academy](#)
- [IXL](#)- Recommended Skills Practice
 - J.3 Add & Subtract Fractions with Unlike Denominators
 - J.6 Add & Subtract Mixed Numbers
 - J.7 Add & Subtract Mixed Numbers: Word Problems
 - K.6 Multiply Two Fractions
 - K.13 Multiply Mixed Numbers
 - K.14 Multiply Mixed Numbers: Word Problems
 - L.5 Divide Fractions
 - L.7 Divide Fractions & Mixed Numbers
 - L.8 Divide Fractions & Mixed Numbers: Word Problems
- [MathXL for School](#)
- [Illustrative Mathematics Performance Tasks](#)
- [NCTM Illuminations](#)
- Quiz Review Sheet (see classroom teacher)

INTERDISCIPLINARY CONNECTIONS

- Computations
- Financial/Economic/Business/Entrepreneurial Literacy

ACCOMMODATIONS & MODIFICATIONS FOR SUBGROUPS

See link to Accommodations & Modifications document in course folder.