Unit # 2 : Multiplying and Dividing Fractions

Content Area: **Mathematics**
Course(s): **College Prep Math 1**
Time Period: **September**
Length: **12 days**
Status: **Published**

Unit Overview

In this unit, prime numbers and divisibility rules will be reintroduced. Along with this concept, factoring whole numbers will covered. Fraction basics and simplification of fractions will be reinforced. Multiplication and division of fractions will be reexplained and reviewed along with applications of each.

Enduring Understandings

- Knowing how to use divisibility rulles can prove to be a handy lifetime skill.
- Multiplying and dividing fractions are skills that have many real world applications.

Essential Questions

- What are the simplest and most accurate methods to multiply and divide fractions ?
- How can a person determine if a number is divisible by 2, 3, 4, 6, 9, or 10 ?
- What is a prime number and how can one determine if a number is prime ?
- When in my life will I need to know how to multiply and divide fractions?

Standards /Indicators / Student Learning Objectives (SLOs)

- SWBAT determine whether a number is divisible by, 2, 3, 4, 5, 6, or 9.
- SWBAT determine whether a number is prime, composite, or neither.
- SWBAT determine whether two fractions are equivalent.
- SWBAT find the factors of a number .
- SWBAT find the factors of a whole number.
- SWBAT find the greatest common factor of two numbers or a group of numbers.
- SWBAT find the prime factorization for any number.
- SWBAT identify proper and improper fractions.
- SWBAT multiply and divide fractions and mixed numbers and give the result in simplified form.
- SWBAT solve applications involving multiplication and division of fractions.
- SWBAT write improper fractions as mixed numbers and vice versa.
- SWBATidnetify the numerator and denominator of a fraton

MA.K-12.4 Model with mathematics.

	Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.
MA.7.NS.A	Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.
MA.K-12.8	Look for and express regularity in repeated reasoning.
	Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x^2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.
MA.5.NF.B	Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
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.7c	Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem.

Lesson Titles:

- Dividing Fractions
- Factoring Whole Numbers
- Fraction Basics
- Multiplying Fractions
- Prime Numbers and Divisiblility
- Simplifying Fractions

Career Readiness, Life Literacies & Key Skills

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.

Inter-Disciplinary Connections

LA.RH.11-12.4	Determine the meaning of words and phrases as they are used in a text, including analyzing how an author uses and refines the meaning of a key term over the course of a text (e.g., how Madison defines faction in Federalist No. 10).
LA.WHST.11-12.1.E	Provide a concluding paragraph or section that supports the argument presented.
SCI.HS-PS4-1	Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.

Instructional Strategies, Learning Activities, and Blooms/DOK:

- Explanation , examples, and practice with division of fractions with applications.
- Explanation , examples, and practice with identification of fraction basics: numerator, denominator, proper and improper fractions, and mixed numerals .
- Explanation , examples, and practice with identifying prime numbers.
- Explanation , examples, and practice with mulitplication of fractions with applications.
- Explanation, examples, and practice with 2 methods of prime factorization and determining the greatest common factor.
- Explanation, examples, and practice with divsisbility rules for the numbers 2, 3, 4, 6, 9, and 10 .
- Tutoring during Delsea One
- Using the sieve of Eratosthenes, students will identify the prime numbers from 1 through 100.

Modifications

ELL Modifications

- 1:1 testing
- Intentional scheduling/grouping with student/teacher who speaks the same language if possible
- Repeat, reword, clarify
- Tap prior knowledge

IEP and 504 Modifications

- Modeling and showing lots of examples

- Allowing student to correct mistakes or answer wrong questions correctly for additional credit if failed the first test (another way to re-teach material)
- Allowing co-teaching with general education and special education teachers in the same classroom so that the special education teacher can re-teach students with special needs in a different way in a smaller group (pulled to the side)
- If not in a co-teaching setting allowing time in the schedule for a special education teacher to consult with general education teachers on what specifically can be modified or how to paraphrase things in a different way specific to that lesson

G & T Modifications

- Additional reinforcement activities soliciting a deeper understanding of curriculum.
- ELA - Creation of technology-based assessments to address the higher levels of Bloom's
- Specific career they are interested in? How would this apply to their interest?
- Student led/directed discussions

At Risk Modifications

- Additional help during tutoring/Delsea One/Academic Enrichment
- Guided notes
- Hands-on Instruction
- Modeling and showing lots of examples
- Review, restate, reword directions
- Study guides
- Tutoring during Delsea One
- Visuals

Formative Assessment

- Accuplacer practice problem
- Begin the homework assignment and periodically check answers together
- Class discussions
- Graded classwork
- Graded homework
- Guided practice
- Individual practice
- Oral questioning
- Oral response
- Teacher observation
- Warm up - "Check Yourself" problems on dividing fractions and mixed numbers
- Warm up - "Check Yourself" problems on estimating products by rounding

- Warm up - "Check Yourself" problems on Factoring Whole Numbers
- Warm up - "Check Yourself" problems on finding the (GCF) of 2 or more numbers
- Warm up - "Check Yourself" problems on finding the reciprocal of a fraction
- Warm up - "Check Yourself" problems on mixed numbers and fractions
- Warm up - "Check Yourself" problems on multiplying 2 fractions
- Warm up - "Check Yourself" problems on Prime Factorization of Whole Numbers
- Warm up - "Check Yourself" problems on Prime Numbers and Divisibility Rules
- Warm up - "Check Yourself" problems on solving applications involving dividing fractions
- Warm up - "Check Yourself" problems on solving applications involving multiplication of fractions
- Warm up - "Check Yourself" problems on using fractions to name parts of a whole
- Warm up - "Check Yourself" problems on writing improper fractions as mixed numbers and vice versa
- Written work

Summative Assessment

- Quiz on Prime numbers, Divisibility, Factoring whole numbers, and Simplifying fractions- sections 2 - 1 through 2 - 4
- Unit Test on Multiplying and Dividing Fractions

Resources & Materials

- "Check Yourself" warm up problems (see warm up section)
- Internet worksheets (see formative assessment section for specific topics)
- Teacher made worksheets (see formative assessment section for specific topics)
- Text: Basic Mathematical Skills with Geometry (2008)

Technology

- Chrome book
- Internet Sources: http://accuplacer.collegeboard.org/students
- Math XL
- Smart Board

TECH.8.1.12.A.CS2	Select and use applications effectively and productively.
TECH.8.1.12.C	Communication and Collaboration: 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.8.1.12.D.CS2	Demonstrate personal responsibility for lifelong learning.