Unit 3 - Fractions

Content Area: **Mathematics**
Course(s): **Mathematics**
Time Period: **Week 10**
Length: **4 Weeks**
Status: **Published**

Unit Overview

Students will be working with multiplying and dividing fractions in this unit. They will be able to multiply and divide any combination of numbers including whole numbers, proper fractions, improper fractions, and mixed numbers. Some pre-requisite skills for this unit include being able to find the greatest common factor in order to simplify fractions and changing between improper and proper fractions. Students will learn to cross simplify fractions before completing the operation to avoid simplifying large numbers at the end. Students will then apply these skills/concepts to real-life situations and solve word problems, such as converting between units using multiplication of fractions and finding the percent of a number using fractions.

Standards

CCSS.Math.Content.6.RP.A.3	Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.
CCSS.Math.Content.6.RP.A.3.c	Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.
CCSS.Math.Content.6.RP.A.3.d	Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.
CCSS.Math.Content.6.NS.A	Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
CCSS.Math.Content.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.

Essential Questions

- What does it mean to multiply and divide fractions?
- How is multiplying and dividing fractions different from multiplying and dividing whole numbers?
- How are greatest common factors used when multiplying and dividing fractions?
- How does simplifying before multiplying or dividing affect the process?
- How can we used the multiplication or division of fractions in real life?

Application of Knowledge: Students will know that...

- a division of fractions must be changed to a multiplication of fractions.
- a whole number can be written as a fraction with a denominator of 1.
- cross-simplifying can help in the multiplication of fractions.
- dimensional analysis is the process of including units of measurement as factors when computing.
- fraction multiplication can be used to find the percent of a number.
- fractions can be written as improper or mixed numbers.
- mixed numbers need to be changed to improper fractions before multiplying.
- multiplying and dividing fractions does not require changing the fractions to have the same denominators.
- reciprocals are any two numbers with a product of 1.
- when multiplying fractions, multiply the numerators and multiply the denominators separately.

Application of Skills: Students will be able to...

- change between improper and proper fractions.
- convert between customary units using multiplication of fractions.
- cross simplify fractions before multiplying or dividing them.
- estimate the product or quotient of fractions.
- find the percent of a number using fraction multiplication.
- find the reciprocal of a number.
- multiply and divide fractions with whole numbers.
- multiply and divide fractions.
- multiply and divide mixed numbers.

Assessments

- Do Now: These daily assessments will include a few questions to check for prior knowledge and to determine mastery of particular topics. Remediation can also be done through this activity on an as needed basis.
- Exit Tickets and Quick Checks: These will be used to measure student understanding of the lesson and assist in determining whether remediation is needed for the topic or if there were any common misconceptions amongst the students.
- Communicator Practice: During guided practice, this will be used as a quick whole-class assessment tool to check for complete comprehension.
- IXL Practice: This online tool will be used to formatively assess students during independent practice. This will provide students with practice and immediate self-check.
- Homework and Classwork: These will be used to formatively assess students. Some examples of activities that can be used in class as assessments are listed in suggested activities (Multiplication of Fraction BINGO, Division of Fractions Task Cards, Multiplication and Division of Fractions Categorization, FACEing Math)
- Marzano learning goals self-assessment: Students will complete tiered questions to determine their own proficiency in the topic on a scale of 0 to 4
- Informal Observations: Walking around the room, listening to productive conversations, and checking in on students will help to formatively assess their learning.

- Mid-Chapter Quiz: This will be used to formatively assess students halfway through the chapter.
- Chapter Test: This will be used to summatively assess students at the end of the chapter.
- Information from this unit will be included on a locally developed, mid-year or end of year benchmark assessment that may take the form of a test, performance based project, or other summative assessment.

Suggested Activities

- Grade 6 Digits Topic 5 and 6 Launches
- Inquiry labs using hundreds blocks to show operations with fractions
- Student centered Smart Board lessons using hundreds blocks that students can interact with
- Review games using communicators
- Marzano learning goals self-assessment: Students will complete tiered questions to determine their own proficiency in the topic on a scale of 0 to 4
- Buzzmath Multiplication of Fractions introduction with hundreds block modeling
- Multiplication of Fraction BINGO - Students will complete practice on multiplying fractions through a BINGO game that will allow them to self-check as they play
- Division of Fractions Task Cards - Students will work in a group to solve world problems involving division of fractions
- Division of Fractions Memory Game - Students will work in pairs and solve problems on Division of Fractions and try to match them with the correct answers by memory
- Multiplication and Division of Fractions Categorization - Students will work in groups to categorize a mixture of multiplication and division word problems and then solve the problems when they have them sorted correctly
- FACEing Math - Students will practice operations with fractions where the answers will complete a face that can be easily checked for accuracy

Activities to Differentiate Instruction

Differentiation for special education:

- General modifications may include:
    - Modifications & accommodations as listed in the student's IEP
    - Assign a peer to help keep student on task
    - Modified or reduced assignments
    - Reduce length of assignment for different mode of delivery
    - Increase one-to-one time
    - Working contract between you and student at risk
    - Prioritize tasks
    - Think in concrete terms and provide hands-on-tasks
    - Position student near helping peer or have quick access to teacher
    - Anticipate where needs will be
    - Break tests down in smaller increments
- Content specific modifications may include:

    - Use hundreds blocks to model the multiplication of fractions
    - Use clay to model how the multiplication of fractions actually makes the product smaller
    - Use fractions that are more easily simplified
    - Provide guided notes and step-by-step instructions for operations with fractions
    - Provide completed worked out examples on classwork and homework that students may use as a guide

Differentiation for ELL's:

- General modifications may include:
    - Strategy groups
    - Teacher conferences
    - Graphic organizers
    - Modification plan
    - Collaboration with ELL Teacher
- Content specific vocabulary important for ELL students to understand include:
    - Reciprocal, proper fraction, improper fraction, mixed numbers, simplify, customary units, dimensional analysis

Differentiation to extend learning for gifted students may include:

- Multiplication or division of more than two fractions
- Using numbers that are not as obviously simplified and require mastery in divisibility rules
- Introduction to distributive property in multiplication of fractions
- Identify and analyze errors in worked out problems

Technology Integration

- iPads or Chromebooks as appropriate to the activity.
- Online learning components including use of the Digits digital textbook, Buzzmath, KhanAcademy, and other resources.
- Teacher integration of the SMART board to facilitate active student engagement throughout the course of the lesson.
- Software or online programs that teachers may use to create students materials or generate problems such as Kuta software.
- Additional practice provided through the use of IXL

Integrated/Cross-Disciplinary Instruction

- **ELA:** Using grammatically correct sentences, descriptive words, and transitions when describing procedure or analyzing operations with fractions
- **Science:** Converting between customary and metric systems
- **Family Life:** Using multiplication of fractions to convert between customary units or adjusting recipes

to fit desired serving size
- **Art/Architecture:** Using multiplication of fractions in scaling
- **Economics:** Using multiplication of fractions to find the percent of a number

Resources

- Digits student access and support: www.MyMathUniverse.com
- Digits teacher materials and support: www.pearsonrealize.com
- IXL: www.ixl.com
- SMART Exchange: www.exchange.smartteach.com
- SMART Board Lessons
- Pizzazz worksheets (self-correcting)
- Kuta software generated worksheets
- Khanacademy: www.khanacademy.org
- Buzzmath: www.buzzmath.com
- NCTM Illuminations: www.illuminations.nctm.org
- New Jersey Center for Teaching and Learning: www.njctl.org

21st Century Skills

CRP.K-12.CRP4	Communicate clearly and effectively and with reason.
CRP.K-12.CRP6	Demonstrate creativity and innovation.
CRP.K-12.CRP8	Utilize critical thinking to make sense of problems and persevere in solving them.
CRP.K-12.CRP12	Work productively in teams while using cultural global competence.