MATHEMATICS COMMON CORE CURRICULUM UNIT
North Smithfield School Department

UNIT 3: More fractions: multiplication of a fraction by a fraction or whole number **COURSE OR GRADE: 5**

DATE PRESENTED: _____DATE DUE: _____ LENGTH OF TIME: Several Weeks

OVERVIEW OF UNIT:

In this unit, students will extend previous understanding of multiplication and division to multiply and divide fractions.

ESSENTIAL QUESTION, PROMPT, PROBLEM/UNIT

What is a fraction that can be used to represent and solve a multiplication or division story problem? What model can be used to explain why multiplying a number by a fraction less than one results in a product smaller than the given number? How is multiplication similar to or different from scaling (resizing)? How is dividing a whole number by a fraction similar to/different from dividing a fraction by a whole number?

STANDARDS: Common Core Math Standards – Grade level domains K-5

Counting and Cardinality CC	Operations and Algebraic Thinking OA	Number and Operations in Base Ten NBT	Number and Operations – Fractions NF	Measurement and Data MD	Geometry G
☐	☐	☐ NBT 4-7	☐	☐	☐
☐	☐	☐	☐	☐	☐
☐	☐				
☐	☐				

STANDARDS: Mathematical Practices grades K-12

1. Make sense of problems and persevere in solving them
2. Reason abstractly and quantitatively
3. Construct viable arguments and critique the reasoning of others
4. Model with mathematics ★
5. Use appropriate tools strategically
6. Attend to precision
7. Look for and make use of structure
8. Look for and express regularity in repeated reasoning

FOCUS MATHEMATICS STANDARDS: see curriculum for specific standards, e.g.

- Apply and extend previous understandings of multiplication and division to multiply and divide fractions.
  5.NF.4, 5, 6, and 7
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Applied Learning Standards:

problem solving communication critical thinking research reflection/ evaluation

ENDURING UNDERSTANDING:

Fractions can be used to represent and solve a multiplication or division number story. Models can be used to explain why multiplying a number by a fraction less than one results in a product smaller than the given number. Multiplication is similar to and different from scaling (resizing). Dividing a whole number by a fraction is similar to and different from dividing a fraction by a whole number.

PRIOR KNOWLEDGE: (from grade 4 CCSS)

- Understand a fraction *a*/*b* as a multiple of 1/*b*. *For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).*
- Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number.
- Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.

*Referenced templates from *Common Core Curriculum Maps, English Language Arts* and *The Understanding By Design Guide to Creating High Quality Units*

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STUDENT OBJECTIVES, SKILLS and/or NEW KNOWLEDGE:

- NF.4: Division problems involving whole numbers and fractions may be represented and solved using visual fraction models.
- NF.5: Multiplication can be interpreted as scaling (resizing).
- NF.6: Multiplying a given number by a fraction less than 1, results in a product smaller than the given number; likewise, multiplying a given number by a fraction greater than 1, results in a product greater than the given number.
- NF.7: Extend understanding of the meaning of fractions, how many unit fractions are in a whole, and understanding of multiplication and division as involving equal groups or shares and the number of objects in each group/share.

SUGGESTED PROBLEMS:

5.NF.4 Advanced

- http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/321/original/illustrative_mathematics_321.pdf?1343856886

5.NF.5 Basic

- http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/150/original/illustrative_mathematics_150.pdf?1343856897

5.NF.5 Advanced

- http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/049/original/illustrative_mathematics_49.pdf?1343856911
- http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/022/original/illustrative_mathematics_22.pdf?1343856914

5.NF.6 Basic

- http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/296/original/illustrative_mathematics_296.pdf?1343856902
- http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/294/original/illustrative_mathematics_294.pdf?1343856915

5.NF.6 Advanced

- http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/297/original/illustrative_mathematics_297.pdf?1343856908
- http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/609/original/illustrative_mathematics_609.pdf?1345511789

5.NF.7 Basic

http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/957/original/illustrative_mathematics_957.pdf?1352927826

5.NF.7 Advanced

- http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/001/172/original/illustrative_mathematics_1172.pdf?1347748658
- http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/001/196/original/illustrative_mathematics_1196.pdf?1350355804
- http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/012/original/illustrative_mathematics_12.pdf?1343856888
- http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/829/original/illustrative_mathematics_829.pdf?1343856903
- http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/001/120/original/illustrative_mathematics_1120.pdf?1350052495
- http://s3.amazonaws.com/illustrativemathematics/illustration_pdfs/000/000/958/original/illustrative_mathematics_958.pdf?1352927848 (#2)

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ACTIVITIES, PRODUCTS, PERFORMANCE, and ASSESSMENTS:

1. Application to real world problems
2. Creating charts/collecting data
3. Collaboration - interpersonal
4. Conferencing
5. Exhibits
6. Graphic organizers
7. Graphing
8. Interviews
9. Journals
10. KWL charts
11. Mathematical Practices
12. Modeling ★
13. Oral presentations
14. Problem/Performance based/common tasks
15. Real-life applications involving graphing
16. Represent numbers
17. Rubrics/checklists (mathematical practice, modeling)
18. Technology
19. Summarizing and note-taking
20. Tests and quizzes
21. Writing genres
    Arguments/ opinion
    Informative

- NF.4: Interpret products using fraction models and create story contexts.
- NF.4: Use area models to find the area of a rectangle with fractional side lengths.
- NF.4: Represent fraction products as rectangular areas.
- NF.5: Interpret multiplication as scaling
- NF.6: Use visual fraction models or equations to represent real world problems.
- NF.7: Divide unit fractions by whole numbers and vice versa.
  See curriculum for specific examples

HIGHER ORDER THINKING SKILLS: Web's Depth of Knowledge 2 – 4 or Bloom's Taxonomy

Web's Depth of Knowledge

- skill/conceptual understanding
- strategic reasoning
- extended reasoning

Bloom's Taxonomy

- apply
- analyze
- synthesize/create
- evaluate

ADDITIONAL RESOURCES: see curriculum for specifics

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VOCABULARY

NF

- Common denominator
- Denominator
- Equivalent
- Improper fraction
- Mixed number
- Numerator
- Parts
- Shares
- Simplest form
- Whole

*Referenced templates from *Common Core Curriculum Maps, English Language Arts* and *The Understanding By Design Guide to Creating High Quality Units*

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LESSON PLAN for UNIT _____

LESSONS

- **Lesson # 1 Summary:**
- **Lesson #2 Summary:**
- **Lesson #3 Summary:**

OBJECTIVES for LESSON # _____

- **Materials/Resources:**
- **Procedures:**
  - **Lead –in**
  - **Step by step**
  - **Closure**
- **Instructional strategies:** see curriculum introduction
- **Assessments:** see curriculum introduction
  - **Formative**
  - **Summative**

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