Unit 4 Chapter 07 Multiplying Fractions

Content Area: **Mathematics**
Course(s): **Math 5**
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Unit Summary

In this unit, students investigate multiplication of fractions by whole numbers and use models to learn how to multiply fractions by fractions and mixed numbers. Students learn to relate multiplication to scaling and to predict the relative sizes of factors and products.

Standards

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.5	Interpret multiplication as scaling (resizing), by:
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.
MA.5.NF.B.4a	Interpret the product $(a/b) \times q$ as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations $a \times q \div b$.
MA.5.NF.B.4b	Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.
MA.5.NF.B.5a	Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
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.
TECH.8.1.5.A.1	Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems.
TECH.8.1.5.A.2	Format a document using a word processing application to enhance text and include graphics, symbols and/or pictures.
TECH.8.1.5.A.CS2	Select and use applications effectively and productively.

Student Learning Objectives

Students will learn to:

- model the fractional part of a group.
- model the product of a fraction and a whole number.
- multiply fractions and whole numbers.
- multiply fractions using models.
- relate the size of the product compared to the size of one factor when multiplying fractions.

- multiply fractions.
- use a model to multiply two mixed numbers and find the are of a rectangle.
- relate the size of the product to the factors when multiplying improper fractions.
- multiply mixed numbers.
- solve problems using the strategy *guess, check and revise*.

Essential Questions

- How can you multiply fractions?
- How can you find the fractional part of a group?
- How can you use a model to show the product of a fraction and a whole number?
- How can you find the product of a fraction and a whole number without using a model?
- How can you use an area model to show the product of two fractions?
- How does the size of the product compare to the size of one factor when multiplying fractions?
- How can you use a unit tile to find the area of a rectangle with fractional length sides?
- How does the size of the product compare to the size of one factor when multiplying improper fractions?
- How do you multiply mixed numbers?
- How can you use the strategy *guess, check, and revise* to solve problems with fractions?

Enduring Understandings

Students will understand that:

- fractions can represent parts of a group.
- problems involving multiplication of fractions and mixed numbers can be solved by using models or an algorithm.
- there is a relationship between the size of a product compared to the size of one factor when multiplying fractions.
- multiplying two fractions is essentially taking a part of a fraction and the product will be smaller than the starting fractions.
- fractions should be represented in their simplest form.
- when multiplying an improper fraction by a fraction less than 1, the product will be less than the improper fraction and greater than the factor that is less than 1.

Application

Students will be able to independently use their learning to:

- solve multiplication equations of fraction by fraction, fraction by whole numbers, and mixed numbers.
- find the area of a given rectangle with the fractional dimensions. (Unit fractions and mixed numbers).
- create a multiplication model using shading or tiling to demonstrate a product when given an appropriate array.
- predict if a product will be larger or smaller than the given whole number when given a simple multiplication word problem where one factor is a fraction (unit or mixed).

Skills

Students will be skilled at:

- multiplying fractions or whole number by a fraction.
- calculating area of rectangle with fractional sides.
- estimating a product by understanding when multiplying less than a whole number, the product will be less than the other factor. If it is greater than one, the product will be more than the other factor. (Scaling or resizing)
- solving real world problems with modeling.
- finding the reciprocal of a number.