Core Content

Cluster Title: Apply and extend previous understandings of multiplication and division to multiply and divide fractions.

Standard 5: Interpret multiplication as scaling (resizing) by:

a. 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.

MASTERY Patterns of Reasoning:

Conceptual:

Students will understand that when you increase or decrease one of the factors in a multiplication problem, the product will also increase or decrease.

Students will understand that multiplying greater factors results in greater products and multiplying lesser factors results in lesser products.

Procedural:

Students can compare products mentally. For example, 4 x 9 is greater than 2 x 9 because 4 is greater than 2.

Example: 6 x 9 = 54
3 x 9 = 1/2 x 54 because 3 is 1/2 of 6

6 x 24 = 144
2 x 24 = 1/3 x 144 because 2 is 1/3 of 6

Representational:

Students can draw a model to compare the size of products based on various factors.

Domain: Number and Operations-Fractions Grade: Fifth

Supports for Teachers

Critical Background Knowledge
Conceptual: Students will understand relationships between the size of the factors and products. **Procedural:** Students can multiply whole numbers**.** **Representational:** Students can multiply using area models or arrays.
Academic Vocabulary and Notation
scaling, array, factors, products, x means “of”

Instructional Strategies Used	Resources Used
Put students in small groups to solve problems such as those found below. Have each group present their answers to the class and justify their answers using models and equations. Example 1: Mrs. Jones teaches in a room that is 60 feet wide and 40 feet long. Mr. Thomas teaches in a room that is half as wide, but has the same length. How do the dimensions and area of Mr. Thomas’ classroom compare to Mrs. Jones’ room? Draw a picture to prove your answer. Example 2: How does the product of 225 x 60 compare to the product of 225 x 30? How do you know? Possible strategy/answer: Since 30 is half of 60, the product of 22 5 x 60 will be double or twice as large as the product of 225 x 30.	Numbers and Operations 3-5—Rectangular Multiplication: http://nlvm.usu.edu/en/nav/grade_g_1.html

Code: 5NF5a

Domain: Number and Operations-Fractions Grade: Fifth

Assessment Tasks Used	
Skill-Based Task: Without multiplying, which product is larger and why? 12 x 12 or 12 x 48	**Problem Task:** Joey has a bedroom that is 12 feet by 8 feet long. His sister, Mary, has a bedroom that is 10 feet by 12 feet long. Which bedroom has the greatest area? Justify your reasoning with a model and an equation.

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