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| **NC.5.NF.4**  **Multiplying Fractions with Color Tiles** | |
| **Domain** | **Numbers and Operations - Fractions** |
| **Cluster** | **Apply and extend previous understandings of multiplication and division to multiply and divide fractions** |
| **Standard(s)** | **NC.5.NF.4** Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction, including mixed numbers.   * Use area and length models to multiply two fractions, with the denominators 2, 3, 4. * Explain why multiplying a given number by a fraction greater than 1 results in a product greater than the given number and when multiplying a given number by a fraction less than 1 results in a product smaller than the given number. * Solve one-step word problems involving multiplication of fractions using models to develop the algorithm. |
| **Materials** | Paper and pencil  1 inch grid paper and color tiles |
| **Task** | **Part 1:**  Have students cut a 4 x 4 inch grid and solve the problem below.  Cover of the grid with one color of the tiles.  Cover of the covered area with another color of the tiles.  Write an equation to show how much of your model is covered by both colors oftiles*.*  **Part 2:**  Have students cut a 6 x 6 inch grid and solve the problem below.  Cover of the grid with one color of the tiles.  Cover of the covered area with another color of the tiles.  Write an equation to show how much of your model is covered by both colors of tiles.  **Part 3:**  What relationship do you notice between the numerators in your two factors and your product? What relationship do you notice between the denominators? |

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| **Rubric** | | |
| **Level I**  **Not Yet** | 1. **Level II** 2. **Progressing** | **Level III**  **Meets Expectations** |
| * Student is not yet able to build the models described in this task. | Student correctly completes 2 or 3 of the bullets below:   * Student is independently able to build the model described in Part 1. * Student is independently able to build the model described in Part 2. * Student is able to record the equations to represent Part 1 () and Part 2(). * Student describes the relationship between the factors and the product. | Student correctly completes all of the bullets below:   * Student is independently able to build the model described in Part 1. * Student is independently able to build the model described in Part 2. * Student is able to record the equations to represent Part 1 () and Part 2(). * Student describes the relationship between the factors and the product. |

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| **Standards for Mathematical Practice** |
| 1. **Makes sense and perseveres in solving problems.** |
| **2. Reasons abstractly and quantitatively.** |
| 3. Constructs viable arguments and critiques the reasoning of others. |
| **4. Models with mathematics.** |
| 5. **Uses appropriate tools strategically.** |
| 6. **Attends to precision.** |
| **7. Looks for and makes use of structure.** |
| 8. Looks for and expresses regularity in repeated reasoning. |

This task was adapted from *NYC Public Schools.*

**Multiplying Fractions with Color Tiles**

**Part 1:**

Have students cut a 4 x 4 inch grid and solve the problem below.

Cover of the grid with one color of the tiles.

Cover of the covered area with another color of the tiles.

Write an equation to show how much of your model is covered by both colors oftiles*.*

**Part 2:**

Have students cut a 6 x 6 inch grid and solve the problem below.

Cover of the grid with one color of the tiles.

Cover of the covered area with another color of the tiles.

Write an equation to show how much of your model is covered by both colors of tiles.

**Part 3:**

What relationship do you notice between the numerators in your two factors and your product? What relationship do you notice between the denominators?