

Core Content

Cluster Title: Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
Standard 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. For example, create a story context for $(2/3) \div (3/4)$ and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that $(2/3) \div (3/4) = 8/9$ because $3/4$ of $8/9$ is $2/3$. (In general, $(a/b) \div (c/d) = ad/bc$.) How much chocolate will each person get if 3 people share $1/2$ lbs. of chocolate equally? How many $3/4$ -cup servings are in $2/3$ of a cup of yogurt? How wide is a rectangular strip of land with length $3/4$ mi. and area $1/2$ square mi.?
MASTERY Patterns of Reasoning:
<p>Conceptual:</p> <ul style="list-style-type: none"> Understand how to set up a problem based on the context of the problem. Be able to interpret what the quotient represents. Recognize that what is known or not known is based on the type of division needed (partitive—Total / # of groups = size of groups—or quotative or measurement—Total / size of group = # of groups) model. Create a story context using division of fractions. Understand that multiplication and division are inverse operations regardless of the class of numbers. <p>Procedural:</p> <ul style="list-style-type: none"> Compute the division of fractions. Solve a story context using division of fractions. <p>Representational:</p> <ul style="list-style-type: none"> Model division of fractions with manipulatives, diagrams (e.g., bar model, number line) and story contexts. Write equations representing authentic problems involving fractions.

Supports for Teachers

Critical Background Knowledge
<p>Conceptual:</p> <ul style="list-style-type: none"> Know that multiplication and division are inverse operations. Know that division is either fair sharing (partitive) or repeated subtraction (quotative).

<p>Procedural: Convert between improper fractions and mixed numbers. Division by whole numbers. Division of a whole number by a fraction.</p> <p>Representational: Model division with manipulatives, diagrams and story contexts.</p>	
<p>Academic Vocabulary and Notation quotient, reciprocal, inverse operation</p>	
<p>Instructional Strategies Used</p> <p>Use this problem: How many servings of popcorn are in $4\frac{1}{2}$ cups if each person receives $\frac{3}{4}$ cup of popcorn</p> <p>The teacher provides $4\frac{1}{2}$ cups of popcorn. Students use a $\frac{3}{4}$ cup measuring cup to solve the problem. Record solutions as a group.</p> <ol style="list-style-type: none"> 1. Think-Pair-Draw-Share: Put students in pairs. Have one solve the problem using a picture/diagram and the other solve using the algorithm. Then they get together and compare. 2. Think-Pair-Share: Students solve the problem on their own, then get together and discuss how their solutions are the same and how they are different. 3. Four Corners: Give students a problem and the quotient. Give each corner in your room a label and have students go to the corner they think would be the correct label for the quotient. 	<p>Resources Used</p> <p>Fraction Bars from NLVM: http://nlvm.usu.edu/en/nav/frames_asid_265_g_2_t_1.html?open=activities&from=category_g_2_t_1.html</p>

Assessment Tasks Used	
Skill-based Task: Use representations to show that $1/4$ divided by $1/2$ is $1/2$, that $2/3$ divided by $2/5$ is $5/3$, that $2/3$ divided by $3/4$ is $8/9$, and that $1\frac{1}{2}$ divided by $6/4$ is 1.	Problem Task: You have $5/8$ pound of Skittles. You want to give your friends $1/4$ lb. each. How many friends can you give Skittles to? Explain your answer. You have a $3/4$ -acre lot. You want to divide it into $3/8$ -acre lots. How many lots will you have? Draw a diagram to justify your solution. You have a $3/4$ -acre lot. You want to divide it into 2 sections. How many acres in each section will you have? Draw a diagram to justify your solution. How wide is a rectangular strip of land with length $3/4$ mi. and area $1/2$ square mi.?