

Core Content

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

Standard 7: Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.

- Interpret division of a unit fraction by a non-zero whole number and compute such quotients. For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.
- Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.
- Solve real-world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share $1/2$ lb. of chocolate equally? How many $1/3$ -cup servings are in 2 cups of raisins?

MASTERY Patterns of Reasoning:

Conceptual:

Students will understand division of a unit fraction by a non-zero whole number.

Students will understand division of a whole number by a unit fraction.

Students will understand division of a unit fraction by a non-zero whole number and also division of whole numbers by unit fractions in real-world problems.

Procedural:

Students can develop an equation to represent the division of a unit fraction by a non-zero whole number or division of a whole number by a unit fraction.

Students can develop strategies to make sense of real-world problems.

Representational:

Students can use visual fraction models to illustrate division of a unit fraction by a non-zero whole number or division of a whole number by a unit fraction. (For example, 4 students are sharing $1/2$ of a cookie. How much of a cookie does each student receive? Use fraction circles to represent the problem and solve $(1/2) \div 4 = 1/8$).

Students can also use number lines, grids, and graph paper to illustrate real-world problems.

Supports for Teachers

Critical Background Knowledge

Conceptual:

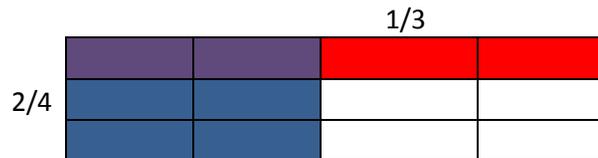
- Students will understand how to multiply whole numbers.
- Students will understand how to multiply a whole number by a fraction.
- Students will understand the meaning and use of inverse operations.
- Students will demonstrate understanding of fractional representations.
- Students will understand the number of unit fractions in a whole.
- Students will understand division involves equal groups/sharing.

Procedural:

- Multiply whole numbers by unit fractions.
- Identify the number of unit fractions within the whole.

Representational:

- Placing fractions on a number line.
- Use a visual model for multiplying fractions.



Academic Vocabulary and Notation

unit fractions, whole numbers, quotient, dividend, divisor, equation, inverse operations

Instructional Strategies Used

Provide real-world problems and then provide manipulatives so that all students can access the content.

$1/3$ of a pan of brownies is on the table. 8 friends want to share the brownies. How much of the total pan does each person get?

Resources Used

<http://www.ixl.com/math/grade-5/divide-fractions-by-whole-numbers>

<p>Bill is going to run an 8-mile race. There are check points every $\frac{1}{3}$ of a mile. How many check points are there in the race?</p> <p>Give students an equation. Have them come up with a real-world problem that represents the equation. Example: $5 \div \frac{1}{6} = ?$</p> <p>Have students create their own real-world problems. Students can then trade problems with a partner and solve each other's problems.</p>	
<p>Assessment Tasks Used</p>	
<p>Skill-Based Task: $\frac{1}{9} \div 3 = n$ $12 \div \frac{1}{4} = n$</p>	<p>Problem Task: $\frac{1}{2}$ of a pie is shared between 3 friends. How much of the original whole pie does each person get?</p> <p>Jacob has a 40-gallon gas tank. If it fills up $\frac{1}{8}$ of a gallon every minute, how long will it take to fill an entire tank?</p>