

Core Content

Cluster Title: Use the four operations with whole numbers to solve problems.

Standard 3: Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies, including rounding.

MASTERY Patterns of Reasoning:

Conceptual:

Students will decode and understand multistep word problems that may or may not include remainders.

Students will decode and understand multistep word problems and create an equation with a variable representing the unknown number.

Students will determine the reasonableness of the calculated answer using mental computation and estimation strategies.

Procedural:

Students can interpret a multistep equation that includes the four basic operations.

Students can create and solve an equation using a variable or symbol to represent an unknown number in a multistep problem, interpreting remainders when needed.

Students can evaluate the reasonableness of the answer through mental math, estimation, and rounding.

Representational:

Students can represent and solve multistep word problems that include the four basic operations and which may or may not include remainders through the use of models, illustrations, and/or writing.

Supports for Teachers

Critical Background Knowledge
<p>Conceptual:</p> <ul style="list-style-type: none"> Students will possess an understanding of number sense. Students will be proficient in the four basic operations. Students will identify the relationship between the four basic operations. Students will understand how to solve a word problem. Students will understand the use of variables for unknown numbers. Students will understand the meaning of remainders. <p>Procedural:</p> <ul style="list-style-type: none"> Students achieve mastery of basic math facts using the four operations. Students can write equations that include unknown variables. Students can solve division problems with remainders. Students can use mental math and estimation to determine the reasonableness of an answer. <p>Representational:</p> <ul style="list-style-type: none"> Students can use manipulatives, drawings, algorithms, and/or journaling to solve multistep word problems.
Academic Vocabulary and Notation
<p>multistep word problem, mental math, estimation, rounding, remainder, variable, operations, equation, reasonableness</p>

Instructional Strategies Used	Resources Used
<ol style="list-style-type: none"> 1. Polya’s Problem-Solving Method: <ol style="list-style-type: none"> a. Understand the problem. b. Devise a plan. c. Carry out the plan. d. Look back and evaluate the answer. 	<p>http://www.mathplayground.com Click on the “Word Problems” tab and select “Word Problems with Katie” for different types of multistep problems.</p> <p>http://www.mathscore.com/math/practice/Word%20Problems%20With%20Remainders/</p>

	<p>The site has multiple problems listed that require students to solve different operations in steps to determine the answer.</p> <p>http://www.ixl.com/math/grade-4/multi-step-word-problems</p> <p>The site offers additional examples of word problems.</p> <p>http://www.internet4classrooms.com/grade_level_help/solve_problems_math_fourth_4th_grade.htm</p> <p>Look for the activity “Two-step Computation” to play a game with multi-step operations.</p>
<p>Assessment Tasks Used</p>	
<p>Skill-Based Task: Solve an equation from a given multistep word problem. Then check the reasonableness of the answer using mental math or estimation.</p>	<p>Problem Task: A 17-inch long piece of rope is cut into 2-inch pieces. How many 2-inch pieces are there? How much of the rope is left? Draw a picture or diagram that illustrates the problem. Write an equation using a symbol for the unknown variable. Solve the equation. Use mental math or estimation to determine the reasonableness of your answer. Write an explanation of how you know you are right.</p>