

Core Content

Cluster Title: Perform operations with multi-digit whole numbers and with decimals to hundredths.

Standard 7: Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

MASTERY Patterns of Reasoning:**Conceptual:**

Students will understand the relationship between addition and subtraction when adding, subtracting, multiplying and dividing decimals.

Students will understand the properties of operations in relationship to adding, subtracting, multiplying, and dividing decimals to the hundredths place.

Students will understand the significance of place value when adding, subtracting, multiplying and dividing as it applies to decimals.

Procedural:

Students can add, subtract, multiply, and divide decimals to hundredths. Include decimal dividends and divisors.

Students can divide whole numbers by 0.1 and 0.01 to build understanding of the place value significance in division of decimal numbers.

Representational:

Students can use concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction.

Students can relate the strategy to a written method and explain the reasoning used.

Supports for Teachers

Critical Background Knowledge	
<p>Conceptual: Students will understand the inverse relationship of multiplication and division. Students will understand the relationship between all operations (+ - x ÷) when working with whole numbers. Students will understand place value up to the thousandths place. Students will understand the properties of operations in relationship to adding, subtracting, multiplying, and dividing multi-digit whole numbers.</p> <p>Procedural: Students can fluently add, subtract, multiply, and divide multi-digit whole numbers using the standard algorithms.</p> <p>Representational: Students can model whole number division. Students can model multi-digit whole number multiplication. Students can accurately represent multi-digit whole numbers with concrete models and drawings.</p>	
Academic Vocabulary and Notation	
properties of operations, operation notations, multiplication symbols [3 x a, 3 · a, 3 * a, 3(a), 3a] division notation ($\frac{a}{b}$, a/b , $a \div b$, $a \overline{)b}$)	
Instructional Strategies Used	Resources Used
Build understanding of place value by dividing by 0.1 and 0.01 before moving to other tenths and hundredths. Explore how the result is related to using the powers of ten to multiply or divide. Use a variety of measurement contexts for addition and subtraction of decimal numbers.	National Library of Virtual Manipulatives: http://nlvm.usu.edu/en/nav/frames_asid_264_g_2_t_1.html?from=category_g_2_t_1.html

<p>Explain the significance of decimal places when working with measurement (time, weight, length, money, area, volume).</p> <p>Have students make up a story problem that involves $22.8 \div 6$. Ask them to share their number stories and explain how they got the answer to their problem.</p>	
Assessment Tasks Used	
<p>Skill-Based Task: Calculate the following and show your work.</p> <ol style="list-style-type: none"> 1. $3.4 + 6.2$ 2. $7.7 - 4.1$ 3. 5.6×2.4 4. $8.4 \div 2.1$ 	<p>Problem Task: A tabletop has the measurements 3.5 meters by 1.2 meters. what is the area in square meters? If your brother cut 0.3 meters off of one side, how would that affect the area of the table top. Does it matter which side is cut? Show your work, including a diagram. You can use graph paper if needed.</p> <p>I divided 6.12 by 3 and got the quotient 2.4. What did I do wrong? Give a similar problem where I might make the same error.</p> <p>In this calculation some numbers are missing. What might they be? How do you know?</p> $\begin{array}{r} 3.?? \\ - \underline{?.7?} \\ 1.?3 \end{array}$ <p>I added 3 decimal numbers together and got exactly 4. What might those 3 decimal numbers be?</p> <p>How many different ways can you make your calculator show a number with a particular decimal, such as 12.34, without pressing the decimal point button?</p>