

## Core Content

<b>Cluster Title: Use place value understanding and properties of operations to perform multi-digit arithmetic.</b>
<b>Standard 4:</b> Fluently add and subtract multi-digit whole numbers using the standard algorithm.
<b>MASTERY Patterns of Reasoning:</b>
<p><b>Conceptual:</b>                  Students will understand addition and subtraction of whole numbers less than or equal to one million.                  Students will understand what the standard algorithm for addition and subtraction is and why it is important to know how to use it fluently.</p> <p><b>Procedural:</b>                  Students can use the standard algorithm to fluently add and subtract.</p> <p><b>Representational:</b>                  Students can model the standard algorithm with place value representations. e.g., place value mat, place value drawing and base ten blocks.</p>

## Supports for Teachers

<b>Critical Background Knowledge</b>
<p><b>Conceptual:</b>                  Students will understand meanings of addition and subtraction and their inverse relationship.                  Students will understand place value of whole digit numbers.                  Students will recognize and understand how to use the standard algorithm for numbers less than or equal to 1,000.</p> <p><i>Note: It is incorrect to state that, in a problem such as <math>367 - 289</math>, you cannot subtract 9 from 7, or 89 from 69. It is mathematically possible to subtract a larger number from a smaller number. However, the result is a negative number. Students should be taught at this stage of development that, in the standard algorithm, you regroup if the subtrahend is smaller than the minuend.</i></p>

<p><b>Procedural:</b> Students can add and subtract facts and whole numbers less than or equal to 1,000.</p> <p><b>Representational:</b> Students can model addition and subtraction with manipulatives.</p>	
<p><b>Academic Vocabulary and Notation</b> algorithm, sum, difference, total, addend</p>	
<p><b>Instructional Strategies Used</b></p> <ul style="list-style-type: none"> <li>• Have students use virtual manipulatives to add and subtract multi-digit whole numbers.</li> <li>• Use a place value mat to model addition and subtraction of multi-digit whole numbers.</li> </ul>	<p><b>Resources Used</b></p> <p><a href="http://nlvm.usu.edu/en/nav/frames_asid_154_g_2_t_1.html?from=category_g_2_t_1.html">http://nlvm.usu.edu/en/nav/frames_asid_154_g_2_t_1.html?from=category_g_2_t_1.html</a></p> <p><a href="http://nlvm.usu.edu/en/nav/frames_asid_155_g_2_t_1.html?from=category_g_2_t_1.html">http://nlvm.usu.edu/en/nav/frames_asid_155_g_2_t_1.html?from=category_g_2_t_1.html</a></p>
<p><b>Assessment Tasks Used</b></p>	
<p><b>Skill-Based Task:</b>  <math>93,486 + 17,049 =</math>   <math>45,001 - 13,808 =</math></p>	<p><b>Problem Task:</b></p> <ol style="list-style-type: none"> <li>1. According to the U.S. Census Bureau, the population of Cache County in 2009 was 115,269. In 1990 it was 70,183. How many more people were there in Cache County in 2009? Justify your answer.</li> <li>2. According to the U.S. Census Bureau, the population of Cache County in 2009 was 115,269 and the population of Washington County was 137,473. How many people were there in both counties in 2009? How do you know?</li> </ol>