

Core Content

Cluster Title: Use place value understanding and properties of operations to perform multi-digit arithmetic.
Standard 5: Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
MASTERY Patterns of Reasoning:
<p>Conceptual:</p> <ul style="list-style-type: none"> Students will understand the properties of operations. Students will understand how place value affects multiplication. Students will understand how place value affects decomposing numbers (breaking numbers apart) to multiply. <p>Procedural:</p> <ul style="list-style-type: none"> Students can use multiplication equations to solve a given problem. Students can use basic facts to solve equations. Students can decompose (break apart) a number to multiply. Students can multiply four-digit numbers by one-digit numbers. Students can multiply two-digit numbers by two-digit numbers. <p>Representational:</p> <ul style="list-style-type: none"> Students can model multiplication with manipulatives (e.g., place value blocks, mats, discs, etc.). Students can model multiplication with rectangular arrays and/or area models. Students can illustrate multiplication using graph paper, arrays and/or area models.

Supports for Teachers

Critical Background Knowledge
<p>Conceptual:</p> <ul style="list-style-type: none"> Students will understand the meaning of multiplication. Students will understand multiplying by tens. Students will understand the components in a multiplication equation (e.g., factors, products)

<p>Procedural: Students can understand and use basic multiplication facts fluently.</p> <p>Representational: Students can represent multiplication with different models such as arrays, equal size groups, area models and combinations.</p>	
<p>Academic Vocabulary and Notation product, rectangular array, equation, area model, factors, properties of multiplication, rows, columns, partial products</p>	
<p>Instructional Strategies Used Show the problem of 5×34. Put out 5 baskets for the 5 groups. Each group needs 34 objects (e.g., blocks, discs) to show that number. Then students can add or multiply the 5 groups of 4 ones, then the 5 groups of 3 tens. Add the partial products to solve 5×34. Use area model for multiplication of two digit times two digit numbers. (See Unit 4 under "Resources Used.")</p>	<p>Resources Used baskets, discs, blocks, etc. http://www.prongo.com/math/multiplication.html Use Unit 3 at: http://eduplace.com/math/mthexp/g4/mathbkg/ Use Unit 4 at: http://eduplace.com/math/mthexp/g5/mathbkg/</p>
<p>Assessment Tasks Used</p>	
<p>Skill-Based Task: $8 \times 8,256$ 87×36</p>	<p>Problem Task: Students will measure the length and width of the classroom and then multiply the dimensions to find the area. Repeat in the hall, the cafeteria, and the playground. Determine the proper unit of measurement to use in each case.</p>