

## NJDOE MODEL CURRICULUM

CONTENT AREA: Math	GRADE: 3	UNIT: # 2	UNIT NAME: Properties of Operations
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#	STUDENT LEARNING OBJECTIVES	CORRESPONDING CCSS
<b>1</b>	Recognize the Commutative, Associative, and Distributive Properties as strategies to add and multiply whole numbers.	<b>3.OA.5</b>
<b>2</b>	Solve division of whole numbers by representing the problem as an unknown factor problem.	<b>3.OA.6</b>
<b>3</b>	Multiply and divide within 40 using strategies such as the relationship between multiplication and division.	<b>3.OA.7</b>
<b>4</b>	Use multiplication within 40 to solve word problems using measurement quantities by creating drawings or arrays.	<b>3.OA.3</b>
<b>5</b>	Use multiplication within 40 to solve word problems modeled as equal groups or arrays by writing equations to represent equal groups or arrays.	<b>3.OA.3</b>
<b>6</b>	Recognize arithmetic patterns in addition or multiplication tables and explain the pattern using the properties of operations.	<b>3.OA.9</b>
<b>7</b>	Find the area of a rectangular array by counting the number of square units and compare that number with the product of the (whole number) side lengths.	<b>3.MD.6, 3.MD.7</b>

**Major Content** **Supporting Content** **Additional Content** (Identified by PARCC Model Content Frameworks).

**Bold type indicates grade level fluency requirements.** (Identified by PARCC Model Content Frameworks).

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### Selected Opportunities for Connection to Mathematical Practices

**1. Make sense of problems and persevere in solving them.**

SLO #2 In a division problem, analyze given information and the relationship between multiplication and division to solve the problem.

**2. Reason abstractly and quantitatively.**

SLO #2 Make sense of quantities and their relationships in division problems that are represented as unknown factor problems.

SLO #3 Apply both multiplication and division abilities to problems involving quantitative relationships.

SLO #6 Know and flexibly use different properties of operations to analyze addition or multiplication tables.

**3. Construct viable arguments and critique the reasoning of others.**

SLO #1 Use previously established definitions to recognize that the Commutative, Associative, and Distributive Properties are strategies to add and multiply whole numbers.

SLO #6 Use previously established property of operations definitions to establish reasoning about patterns in addition or multiplication tables.

SLO #6 Justify and be able to explain conclusions made about patterns in addition or multiplication tables.

**4. Model with mathematics.**

SLO #4 Apply previously learned multiplication skills to solve word problems that involve multiplication, measurement, arrays, and drawings.

SLO #5 Apply previously learned multiplication and equation writing skills to solve world problems.

**5. Use appropriate tools strategically.**

SLO #4 Use available and appropriate tools such as drawings and arrays, when solving multiplication word problems that require the use of drawings or arrays.

**6. Attend to precision.**

SLO #6 Precisely communicate arithmetic patterns in addition and multiplication tables.

**7. Look for and make use of structure.**

SLO #6 discern arithmetic patterns in addition or multiplication tables.

**8. Look for and express regularity in repeated reasoning.**

***Bold type identifies possible starting points for connections to the SLOs in this unit.***

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Code #	Common Core State Standards
<b>3.OA.5</b>	Apply properties of operations as strategies to multiply and divide. Examples: If $6 \times 4 = 24$ is known, then $4 \times 6 = 24$ is also known. (Commutative property of multiplication.) $3 \times 5 \times 2$ can be found by $3 \times 5 = 15$ , then $15 \times 2 = 30$ , or by $5 \times 2 = 10$ , then $3 \times 10 = 30$ . (Associative property of multiplication) Knowing that $8 \times 5 = 40$ and $8 \times 2 = 16$ , one can find $8 \times 7$ as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$ (Distributive property). (Students need not use formal terms for these properties)
<b>3.OA.6</b>	Understand division as an unknown factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.
<b>3.OA.7</b>	Fluently multiply and divide within 100, using strategies such as the relationship between multiplication and division (e.g., knowing that $8 \times 5 = 40$ , one knows $40 \div 5 = 8$ ) or properties of operations.
<b>3.OA.3</b>	Use multiplication and division within 100 to solve word problems in situations involving equal groups, arrays, and measurement quantities, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem.
<b>3.OA.9</b>	Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. For example, observe that 4 times a number is always even, and explain why 4 times a number can be decomposed into two equal addends.
<b>3.MD.6</b>	Measure areas by counting unit squares (square cm, square m, square in, square ft, and improvised units).
<b>3.MD.7</b>	Relate area to the operations of multiplication and addition. <ol style="list-style-type: none"> <li>a. Find the area of a rectangle with whole-number side lengths by tiling it, and show that the area is the same as would be found by multiplying the side lengths.</li> <li>b. Multiply side lengths to find areas of rectangles with whole-number side lengths in the context of solving real world and mathematical problems, and represent whole-number products as rectangular areas in mathematical reasoning.</li> </ol>

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