Domain: Operations and Algebraic Thinking   Grade: 3

Core Content

Cluster Title: Represent and solve problems involving multiplication and division.
Standard 4: Determine the unknown whole number in a multiplication or division equation relating three whole numbers. For example, determine the unknown number that makes the equation true in each of the following equations: 8 x ? = 48, 5 = □ ÷ 3, 6 x 6 = ?
MASTERY Patterns of Reasoning:

Conceptual:
    Students will understand that there can be a result unknown (don't know the answer), change unknown (know the first number of the equation, but not the second), or a start unknown (first number in equation not known) within an equation.
    Students will understand the use of a symbol to represent an unknown number.
 	
Procedural:
    Students can apply multiplication or division to solve for an unknown in an equation.
 	
Representational:
    Students can use a model to solve for the unknown whole number in an equation.
    Students can represent an equation by putting the numbers in a real-world problem.
    Students can write a word problem that represents an equation with an unknown.

Supports for Teachers

Critical Background Knowledge

Conceptual:
    Students will understand that both sides of an equation equal the same amount.
    Students will understand that a symbol can be used for an unknown within an equation.
 	
Procedural:
    Students will know how to write an equation.
    Students can use a symbol to represent an unknown number.
    Students can solve a multiplication or division equation.
 	
Representational:
    Students can model multiplication and division using a variety of strategies.

Code: 3OA4

Domain: Operations and Algebraic Thinking   Grade: 3

Academic Vocabulary and Notation
symbol, equal, =, x, ÷

Instructional Strategies Used	Resources Used
Use the multiplication table to help find a missing factor. Provide problems with an unknown to be found. Teach students to use a variety of symbols to represent the unknown. Use an input/output strategy where either the input or output is unknown. Use a number line to model the missing number.	Murphy, Stuart. *Safari Park.* HarperCollins, 2001. The Product Game http://illuminations.nctm.org/LessonDetail.aspx?ID=L272 Complete the Division Sentence Facts to 10 http://www.ixl.com/ Interactive Chart http://www.mathsisfun.com/tables.html

Assessment Tasks Used	
Skill-Based Task: 24= 3 x _____ 56 ÷ △ = 7	**Problem Task:** This is a skill-based standard. No problem is provided.

Code: 3OA4