

Core Content

Cluster Title: Understand properties of multiplication and the relationship between multiplication and division.

Standard 6: Understand division as an unknown-factor problem. For example, find $32 \div 8$ by finding the number that makes 32 when multiplied by 8.

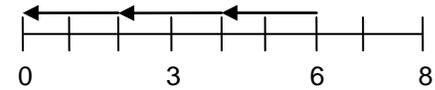
MASTERY Patterns of Reasoning:

Conceptual:
 Students will understand that multiplication and division are related. Therefore, one operation can help solve the other.
 Students will understand unknown-factor problems and how to solve them.

Procedural:
 Students can use fact families and/or number bonds to help solve division equations.
 Students can use related multiplication facts to solve for a missing factor in a division equation.
 Students can find an unknown factor in a division problem.

Representational:
 Students can use an array model to show related multiplication and division equations (e.g., $3 \times 2 = 6$; $2 \times 3 = 6$; $6 \div 2 = 3$; $6 \div 3 = 2$).
 Students can model a division problem to show an unknown factor.
 Students use a number line to represent missing factor problems.

$$6 \div \triangle = 2$$



Supports for Teachers

Critical Background Knowledge

Conceptual:
 Students will understand that multiplication and division are inverse operations.
 Students will understand commutative property for multiplication.
 Students will understand the meaning of the equal sign.
 Students will understand basic multiplication.
 Students will understand that division is reducing a number (repeated subtraction).

<p>Procedural: Students can solve a multiplication equation. Students can solve a division equation.</p> <p>Representational: Students can model multiplication and division in a variety of ways (arrays, groups/sets).</p>	
<p>Academic Vocabulary and Notation</p> <p>fact family/related facts, multiplication, division, inverse, \div, $/$, commutative property, factor</p>	
<p>Instructional Strategies Used</p> <p>Have the students create an array to represent the related multiplication and division equations. Write the related fact families from the arrays.</p> <p>Have students use equal sharing to represent division (groups and sets).</p> <p>Have students create and solve story problems.</p>	<p>Resources Used</p> <p>Long, Lynette. <i>Dazzling Division</i>. Wiley, 2000.</p> <p>Greenberg, Dan. <i>Mega-Funny Division Stories</i>. Teaching Resources, 2002.</p> <p>http://www.ixl.com/math/grade-3/relate-multiplication-and-division</p> <p>http://www.amblesideprimary.com/ambleweb/mentalmaths/dividermachine.html</p> <p>http://math.pppst.com/division.html</p> <p>http://www.wartgames.com/themes/math/division.html</p> <p>http://www.aaamath.com/div39j-divall.html (scroll down to practice)</p>

Assessment Tasks Used	
<p>Skill-Based Task: Create arrays with related multiplication and division facts.</p> <p>Find the missing number. Use the related multiplication fact to help you.</p> <p>$16 \div 2 = \underline{\quad}$</p> <p>$8 \times 2 = 16$</p> <p>$28 \div 7 = \underline{\quad}$</p> <p>$7 \times 4 = 28$</p> <p>$15 \div 3 = \underline{\quad}$</p> <p>$\underline{\quad} \times 3 = 15$</p>	<p>Problem Task: Ana separates 42 kids into 7 teams for kickball. How many kids are on each team? Write the multiplication fact you use to help you divide. Explain your thinking.</p>