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).

Code: 3OA6
Procedural:
- Students can solve a multiplication equation.
- Students can solve a division equation.

Representational:
- Students can model multiplication and division in a variety of ways (arrays, groups/sets).

Academic Vocabulary and Notation
fact family/related facts, multiplication, division, inverse, $\div, /$, commutative property, factor

Instructional Strategies Used | Resources Used
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Have the students create an array to represent the related multiplication and division equations. Write the related fact families from the arrays. | Long, Lynette. *Dazzling Division*. Wiley, 2000.
### Assessment Tasks Used

#### Skill-Based Task:
Create arrays with related multiplication and division facts.

Find the missing number. Use the related multiplication fact to help you.

16 ÷ 2 = ____
8 x 2 = 16

28 ÷ 7 = ____
7 x 4 = 28

15 ÷ 3 = ____
____ x 3 = 15

#### 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.