



Making Meaning for Operations

Session 2

Making meaning for multiplication and division

Overview

Agenda		
Sharing exit-card comments	Whole group	5 minutes
Sharing student thinking	Pairs	20 minutes
Discussion: Norms for learning	Whole group	20 minutes
Video: Early multiplication and division	Whole group	10 minutes
Case discussion: Chapter 2	Small groups Whole group	25 minutes 25 minutes
Break		15 minutes
Math activity: Story problems for division	Small groups Whole group Small groups	25 minutes 25 minutes 5 minutes
Homework and exit cards	Whole group	5 minutes

Mathematical themes

- When working with multiplicative situations, students frequently find it challenging to coordinate the different units, that is, the number of items in a group and the number of groups.
- The variety of students' methods for solving story problems involving multiplication and division illustrates relationships among operations.
- Different kinds of situations can be represented by the same division expression.

Connections to the Common Core State Standards for Mathematics

Standards for Mathematical Practice

Practice 2 Reason abstractly and quantitatively.

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

Standards for Mathematical Content

Grade 2: Operations and algebraic thinking

2.OA.4 Use addition to find the total number of objects arranged in rectangular arrays with up to 5 rows and up to 5 columns; write an equation to express the total as a sum of equal addends.

Grade 3: Operations and algebraic thinking

3.OA.1 Interpret products of whole numbers, e.g., interpret 5×7 as the total number of objects in 5 groups of 7 objects each. For example, describe a context in which a total number of objects can be expressed as 5×7 .

3.OA.2 Interpret whole-number quotients of whole numbers, e.g., interpret $56 \div 8$ as the number of objects in each share when 56 objects are partitioned equally into 8 shares, or as a number of shares when 56 objects are partitioned into equal shares of 8 objects each. For example, describe a context in which a number of shares or a number of groups can be expressed as $56 \div 8$.

3.OA.3 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.

3.OA.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 equations $8 \times ? = 48$, $5 = \square \div 3$, $6 \times 6 = ?$

3.OA.5 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 8×7 as $8 \times (5 + 2) = (8 \times 5) + (8 \times 2) = 40 + 16 = 56$. (Distributive property.)

3.OA.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.