Multiplication and Division Representations

Reporting Category Computation and Estimation

Topics Representing multiplication and division facts

Creating and solving multiplication problems with two whole numbers

Primary SOL 3.6 The student will represent multiplication and division, using area, set, and number line models, and create and solve problems that involve multiplication of two whole numbers, one factor 99 or less and the second factor 5 or less.

Related SOL 3.5

Materials
- Area with Colored Squares Recording Sheet (attached)
- Colored tiles or construction paper squares
- Grid paper with squares that are the same size as the tiles or paper squares
- Product Cards (attached)
- Paper bag

Vocabulary
factor, area, multiply, divide, product, quotient

Student/Teacher Actions (what students and teachers should be doing to facilitate learning)
1. Explain that students will work in pairs to create area models in order to find multiplication facts related to a product (answer to a multiplication problem).
2. Distribute copies of the Area with Colored Squares Recording Sheet. Group students into pairs, and give each pair a set of at least 72 colored tiles or paper squares and several sheets of grid paper.
3. Have each pair draw a Product Card out of the paper bag and then place that number of tiles on a sheet of grid paper to create a square or rectangle as an area model. Direct students to record the number of rows and the number of columns of their area models on their recording sheets under the appropriate headings. Have each pair complete the multiplication fact for their area model. Finally, have each student draw on a separate sheet of grid paper the area model he/she helped to create using the tiles and write the multiplication fact on the drawn model.
4. Have each pair repeat step 3 several times in order to gain experience representing multiplication, using area models.
5. For division, have students use the number line model to solve a division problem such as 6 ÷ 3 and represent it on the number line by noting how many jumps of three go from 6 to 0.
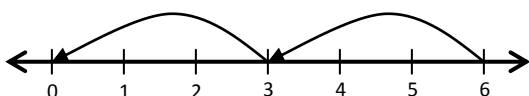
The number of jumps (two) of a given length (three) is the answer to the question.

6. Repeat using the number line model for different divisors and dividends.

Assessment
- **Questions**
  - o What could the area model look like for a product of 12?
- **Journal/Writing Prompts**
  - o Explain why it is helpful to use an area model when solving a multiplication problem.
  - o Explain how using an area model can be related to the commutative property of multiplication.
- **Other**
  - o Have students match multiplication and division facts with their corresponding array or number line printed on index cards.
  - o Provide students with a set of multiplication and division problems, and allow them to model each problem, using an array or a number line.

Extensions and Connections (for all students)
- Have students use number lines to represent addition and subtraction facts.
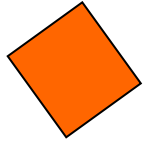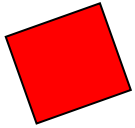
Area with Colored Squares Recording Sheet
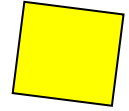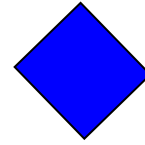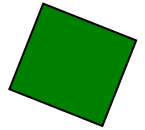
Name: _____ **Date:** _____

Number of rows (factor)	Number of columns (factor)	Number of tiles all together (number on the Product Card)	My Multiplication Fact

Product Cards

Copy on card stock, and cut apart on the dotted lines.

24	**12**	**18**
15	**21**	**8**
42	**10**	**63**
25	**64**	**72**