

Operations and Algebraic Thinking

Students in third grade develop an understanding of the meaning of multiplication and division of whole numbers through activities and problems involving equal-sized groups, arrays, and area models. *Multiplication* is finding an unknown product, and *division* is finding an unknown factor. For equal-sized group situations, division can require finding the unknown number of groups or the unknown group size.

Students use properties of operations to calculate products of whole numbers, using increasingly sophisticated strategies based on these properties to solve multiplication and division problems involving single-digit factors. By comparing a variety of solution strategies, students learn the relationship between multiplication and division. Most third graders will be able to memorize all of the products of two one-digit numbers.

The Grade 3 Common Core State Standards for Operations and Algebraic Thinking specify that students should—

- Represent and solve problems involving multiplication and division.
- Understand properties of multiplication and the relationship between multiplication and division.
- Multiply and divide within 100.
- Solve problems involving the four operations, and identify and explain patterns in arithmetic.

The following hands-on activities will help students model problem-solving situations involving multiplication and division. The activities will help students gain understanding of the relationship between multiplication and division and why their related algorithms make sense.

Mathematically proficient third graders will look to discover patterns and structure as they develop and apply mathematical thinking. They may use properties of operations as strategies to multiply and divide. Similarly, they notice repetitive actions in computation and look for shortcut methods. For example, students may use the distributive property as a strategy for using products they know to find products they don't know.