

G3 Playlist: Applying Properties of Operations

Aligns with *CCSS.MATH.CONTENT.3.OA.B.5*: Apply properties of operations as strategies to multiply and divide.2

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.)

Related Standards

- *CCSS.MATH.CONTENT.3.OA.A.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 .
- *CCSS.MATH.CONTENT.3.OA.A.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 $56 \div 8$.
- *CCSS.MATH.CONTENT.3.OA.A.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.
- *CCSS.MATH.CONTENT.3.OA.A.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 $8 \times ? = 48$, $5 = _ \div 3$, $6 \times 6 = ?$



Objectives

In this module, you will learn and practice the following skills:

- Describe the properties of multiplication and division
- Apply the commutative property of multiplication to change the order of the factors
- Apply the associative property of multiplication to multiply three factors in any order
- Apply the distributive property of multiplication to break the numbers apart
- Apply the zero property of multiplication to multiply by 0
- Apply the multiplicative identity property of 1 to multiply by 1
- Apply the divisive identity property of 1 to divide by 1

Let's get started!

Key Terms

- When you **multiply**, or do **multiplication**, you add equal groups together a specific number of times.
- A **factor** is one number that is multiplied by another number to create a certain product.
- A **product** is the answer to a multiplication problem.
- When you **divide**, or do **division**, you take a whole amount of objects and divide them into smaller, equal groups.
- The **quotient** is the answer to a division problem.
- A **property** is a math rule.
- An **operation** is a math action, such as adding, subtracting, multiplying, or dividing.



Applying Properties of Operations

(3.OA.B.5)

When you **multiply**, or do **multiplication**, you add equal groups together a specific number of times. A **factor** is one number that is multiplied by another number to create a certain product. A **product** is the answer to a multiplication problem. When you **divide**, or do **division**, you take a whole amount of objects and divide them into smaller, equal groups. The **quotient** is the answer to a division problem. A **property** is a math rule. An **operation** is a math action, such as adding, subtracting, multiplying, or dividing.

If your students...

Struggle with the associative property:

WATCH: Order Doesn't Matter When Purely Multiplying

<https://www.khanacademy.org/math/cc-third-grade-math/cc-3rd-exp-pattern-topic/cc-3rd-prop-mult/v/order-doesn-t-matter-when-purely-multiplying>

Struggle with the commutative or distributive property:

WATCH: Properties and Patterns for Multiplication

<https://www.khanacademy.org/math/cc-third-grade-math/cc-3rd-exp-pattern-topic/cc-3rd-prop-mult/v/properties-and-patterns-for-multiplication>

Struggle with the zero or identity property of multiplication:

WATCH: Multiply by 0 and 1

<https://www.opened.com/video/multiply-by-0-and-1/951975>

Struggle with the identity property of division:

WATCH: Divide by 0 and 1

<https://www.opened.com/video/divide-by-0-and-1/881620>

