The Distributive Property (7th Grade)

Begin by providing a definition of the distributive property. According to the distributive property, if we add two or more numbers (that are in parenthesis) and multiply their sum to an outside number, we will get the same result if we multiply the outside number by every number in the parenthesis and then add the products.

Distributive property can be presented thus:

$a \times (b + c) = a \times b + a \times c$

Or

$(b + c) \times a = b \times a + c \times a$

Highlight that we call this the distributive property of multiplication over addition. But the distributive property also works for subtraction, that is:

$a \times (b - c) = a \times b - a \times c$

And also:

$(b - c) \times a = b \times a - c \times a$

How do you teach the Distributive Property (7th Grade)

Review Properties of Numbers

Since the distributive property falls in the category of properties of numbers, you may also want to review the properties of numbers in which children are already fluent. The includes the identity property, the commutative property, and the associative property.

You can write a few equations on the whiteboard where children should identify the property being used as a small bell-work activity. You may also benefit from throwing a glance at our article on the properties of numbers.

Distributive Property of Multiplication Over Addition: Example

Now that you've defined the distributive property, you can move on to providing examples of how we apply it. Start by giving a simple example of how the distributive property works for addition, such as:

$4 \times (8 + 3) =$

$4 \times 8 + 4 \times 3 =$

$32 + 12 =$

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Now you show your students that the distributive property really works for addition by re-doing the above expression and following the normal order of operations, that is, by first adding the numbers in the parentheses and then multiplying that sum by the outside number.

$4 \times (8 + 3) =$

$4 \times (11) =$

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So we got the same result with both approaches and you proved the validity of the distributive property! At this point, children may rightly wonder – why should we do it differently and use the distributive property when we could have easily added the numbers in the parenthesis first?

You should use this opportunity to explain that while in the above expression it would have been easy to first solve the operation in the parenthesis, there are cases where this won't be so simple, such as when we don't have numbers in the brackets, but variables. So by using it with simpler expressions, we're basically preparing ourselves to simplify complex expressions.

Distributive Property of Multiplication Over Subtraction: Example

After providing a few examples of how the distributive property of multiplication works for addition, you can provide examples of how it applies to subtraction as well. For instance:

$5 \times (9 - 4) =$

$5 \times 9 - 5 \times 4 =$

$45 - 20 =$

25

Just like in the example with addition, you can now demonstrate to your students that the distributive property works for subtraction by re-doing the above expression and following the normal order of operations, that is, by first subtracting the numbers in the parentheses and then multiplying that difference by the outside number. That is:

$5 \times (9 - 4) =$

$5 \times (5) =$

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And there you have it – the answer stays the same with both approaches!

Distributive Property for Variables

At this point, you can move on to demonstrating how we use the distributive property to simplify expressions with variables. As previously mentioned, we use this property in such cases as we can't add or subtract the terms inside the parenthesis, because they aren't like terms.

Remind children of what a term is and what like terms are. A term refers to a number, variable, or product or quotient of numbers and variables. Like terms are similar terms that we can add or subtract, such as 3x and 4x, or -38 and 87.

Provide an example of how the distributive property works for simplifying expressions with variables, such as:

$3 - 2 (4 + x) =$

$3 - 2(4) - 2(x) =$

$3 - 8 - 2x =$

$-5 - 2x$

Dice and games squares

Gamification of the classroom has proven to be very effective in encouraging interaction and engagement while teaching a concept to students.

To implement this activity in your tutoring session, you'll need to have enough dice and colorful construction papers. Draw three big and empty squares on each sheet of paper and place two squares inside the parenthesis and one square outside the parenthesis.

You can draw the squares with markers so that their lines are more visible. Place either an addition sign inside the square or a subtraction sign (i.e. + or -). The square outside the parenthesis should be multiplied by the squares inside it.

Divide students into pairs and explain the rules of the game. Decide who will go first by rolling the dice. Whoever rolls the largest sum will be Player 1. Each pair gets one construction paper and three dice. Player 1 rolls the three dice simultaneously in the three squares, trying to roll them inside the squares (therefore it's crucial that the squares are large enough).

It is okay if the dice lands slightly outside the square, the student can place it inside the closest square. Alternatively, player one can roll the three dice anywhere and then place them inside the squares. Then go to the box that corresponds to the roll and solve the problem. For example, if Player 1 solves the problem incorrectly, Player 2 puts their colored marker on that spot. If player 1 solves correctly, they will put their colored marker in the spot. Player 1 then applies the distributive property to solve the expression in their notebook. Player two repeats the process. If you want to add an element of competition, you can also declare a winner the one that gets all answers correct. For example, if you roll a 6, you lose a turn. The player that gets 4 in a row wins the game.

To practice, students roll the dice. You can have students use different colors of dice to reinforce how the terms are different. Once they make their roll, students simplify the expression by using the distributive property. You can use a whiteboard for students to write the expression and simplify it. You could also have them capture their work on paper or a white board.

To make the game more challenging, feel free to add a variable next to one of the squares of even two variables next to both squares inside the parenthesis. You can also bring one red dice that will represent a negative number. The purpose of the game is to practice using the distributive property in a collaborative way, where each player monitors the work of the other one and assists them if they get stuck.

Credits: *www.prealgebracoach.com*

http://www.mathgames.com