

What is the Connection between the Order of Operations and the Distributive Property?

Part 4 of 6 from the Unit: Deepening Understanding of Order of Operations

A Common Core-Aligned Lesson Plan to use in your Classroom

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The activity

Students will discover that the distributive property and the order of operations complement each other. They will be able to write equivalent expressions. They will be able to explain the purpose of grouping symbols.

Full understanding of the distributive property will allow students the flexibility they need to solve algebraic problems.

Students will

- Apply properties of operations as strategies to multiply and divide. (commutative property of multiplication,... associative property of multiplication,... distributive property) CCSS 3.OA.5
- Identify arithmetic patterns (including patterns in the addition table or multiplication table), and explain them using properties of operations. CCSS 3.OA.9
- Use tiling to show in a concrete case that the area of a rectangle with whole-number side lengths a and $b + c$ is the sum of $a \times b$ and $a \times c$. Use area models to represent the distributive property in mathematical reasoning. CCSS 3.MD.7c
- Write expressions that record operations with numbers and with letters standing for numbers. CCSS 6.EE.2a
- Apply the properties of operations to generate equivalent expressions. CCSS 6.EE.3
- Model with mathematics. CCSS MP.4

Resources needed:

- PowerPoint Presentation "[What is the Connection between the Order of Operations and the Distributive Property?](#)" found in Google Drive
- white board plus markers
- scrap paper and writing utensil for each student

Approximate time:

50 minutes

Instructions

Academic Vocabulary: What domain or academic-specific words will you use in the lesson?

- *array* – a set of objects arranged in a specific pattern (usually rows and columns)
 - *distributive property* – multiplying a sum by a number gives you the same result as multiplying each of the added numbers separately and then combining them
- 1) **Lesson:** Refer to Powerpoint Presentation "[What is the Connection between the Order of Operations and the Distributive Property?](#)"
 - 2) **Evidence of Success:** What exactly are students expected to be able to do by the end of the lesson, and how will mastery be measured? What would outsiders see that would convince them that students have developed a deep understanding?
 - Students will orally answer the question about grouping symbols and will answer the essential question in writing at the end of the lesson. These can be reviewed and responded to. Students with full understanding will be able to write expressions that demonstrate the context in two different ways, once distributed and once grouped, before class discussion.

Differentiated Instruction

Know your audience; you may need to change the wording in slide 3 which currently assumes understanding of the words 'sum' and 'addend.'

If students can apply the distributive property in multiple examples, a formal definition is not necessary.

Success Tips

- When demonstrating, eliminate any unnecessary parenthesis.
- Be sure to use context when reading expressions. For example, $3 \cdot 4$ can be read: "Three rows of four." "Times" does not have as much meaning.
- Be sure to *download* the PowerPoint Presentation so that you see the notes section for your own use. Use it from PowerPoint with your class rather than from Google Drive so that the animations are in place.
- Change the names within the PowerPoint Presentation to the names of people in your program.