Order of Operations Bingo

GRADE: 6-8
PERIODS: 1

STANDARDS:

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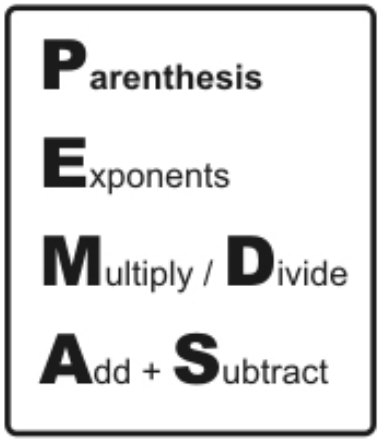
Location: unknow n

Instead of calling numbers to play Bingo, you call (and write) expressions to be evaluated for the numbers on the Bingo cards. The operations in this lesson are addition, subtraction, multiplication, and division. None of the expressions contain exponents.

Instructional Plan | Objectives + Standards | Materials | Assessments + Extensions | Questions + Reflection | Related Resources | Print All

Students can often rattle off the acronym PEMDAS or "Please Excuse My Dear Aunt Sally" as being associated with the *order of operations*. Putting this memory into practice can be more of a challenge. By practicing the correct order with a motivating game of Bingo, students will be more eager to be accurate in their calculations.



One misconception by students is that all multiplication should happen before all division because the *multiplication* comes before *division* in the acronym. In fact, multiplication and division have the same precedence and should be evaluated as they appear from left to right.

Incorrect	Correct
$12 \div 3 \times 4$	$12 \div 3 \times 4$
$12 \div 12$	4×4
1	16

Similarly, *addition* comes before *subtraction* in the acronym, yet they have the same precedence.

Incorrect	Correct
$4+10-5+8$	$4+10-5+8$
$14-13$	$14-5+8$
1	$9+8$
	17

Try giving students an additional example before starting the game.

$$
\begin{aligned}
&2+9\div3-5+6\times5\div2\\
&\quad 2+3-5+30\div2\\
&\quad\ 2+3-5+15\\
&\quad\quad 5-5+15\\
&\quad\quad\ 0+15\\
&\quad\quad\quad 15
\end{aligned}
$$

Playing Order of Operations Bingo

To prepare the materials for the game, you will need to print the Order of Ops Bingo Sheet. The first two pages contain 50 expression strips, which you will need to cut out and place in a bowl, jar, or hat. The third page contains two bingo cards; you will need to photocopy this sheet, cut the copies in half, and distribute a sheet to each student.

Order of Ops Bingo Sheet

The object of the game is to get five numbers in a row, vertically, horizontally, or diagonally, just as in the regular game of bingo.

> NOTE: The operations used for this lesson are addition, subtraction, multiplication, and division. None of the expressions contain exponents or parentheses.

Distribute a Bingo card to each student before starting the game. Give students the following instructions:

- Choose one space on the board as the "free" space and write the word FREE.
- Choose numbers to write into the other 24 boxes on your Bingo card. Make sure you choose numbers in the ranges given at the top of each column. That is, numbers in the first column ("B") must be in the range 1 10, numbers in the second column ("I") must be in the range 11 20, and so on. [This ensures better distribution of the numbers.]
- You are not allowed to repeat any numbers.

Place all of the expression strips in a bowl, jar, or hat, and choose them one at a time. After each selection, write the expression on the board or overhead so students can evaluate it. Students should copy down and evaluate the expression on their own paper. For the first few turns, you may want to model how the numerical value is determined for the expression by writing in any applicable parentheses and going through the steps of

evaluation. Make sure you write out the steps, just as you'd like to see the students do themselves. Once the number is determined, students can look for the number on their Bingo card and mark it with a pencil or a chip.

The value (i.e., the "answer") for each expression follows the expression on each strip, so be sure to share only the *expression*, saving the *answer* to verify a winner.

EXPRESSION	ANSWER
$2\times3+4\times5$	26

Keep picking expressions. Students should calculate the value for each expression, and then mark the square with that number on their card (if that number appears on their card, of course). When a student believes that she has correctly completed a column, row or diagonal on her card, she should yell, "Bingo!"

When the game has a potential winner, ask the student to call out the numbers that make the winning row, column, or diagonal. With the class, determine if the numbers that the winning student calls are indeed values from expressions that have been called out to check the math and verify the win.

To extend the game for another winner, change the rules to require 2 runs of 5 chips, or framing the exterior square of the board (16 pieces).

If students use chips instead of crossing off numbers with a pen or pencil, then they can exchange cards and play again. In order to start a second or subsequent game, all expressions used in the previous game are returned to the bowl, jar, or hat for a fresh start.