

**Subject/Grade: Mathematics 6**

**Lesson Title: Order of Operations**

**Teacher: T. Chesney & C. Martinez**

**Stage 1: Identify Desired Results**

**Outcome(s)/Indicator(s):**

**N6.3**

**Demonstrate understanding of the order of operations on whole numbers (excluding exponents) with and without technology.**

- (a) Explain, with the support of examples, why there is a need to have a standardized order of operations.
- (b) Verify, by using repeated addition and repeated subtraction for multiplication and division respectively, whether or not the simplification of an expression involving the use of the order of operations is correct.
- (c) Verify, by using technology, whether or not the simplification of an expression involving the use of the order of operations is correct.
- (d) Solve situational questions involving multiple operations, with and without the use of technology.

**Key Understandings: ('I Can' statements)**

I can understand that using the order of operations will determine the correct solution.  
I can find a strategy to help me solve order of operation calculations.  
I can identify the difference between an expression and an equation.  
I can determine how to use order of operations to solve mathematical expressions

**Essential Questions:**

- How can technology help us in mathematics? How does it not help us?
- What strategy can I use to remember the order of operations?
- How does the order of operations affect the answer?
- How do I analyze for errors when simplifying expressions?

**Prerequisite Learning:** Basic understanding of math operations (addition, subtraction, multiplication, division)

**Instructional Strategies:** Direct, Interactive

**Stage 2: Determine Evidence for Assessing Learning**

Pre-Assessment:

Formative -- Students will be given an order of operations word problem without instruction, the teacher will then informally assess whether or not the students can achieve the problem without instruction. Students will be aided with loose paper, graph paper, and chips.

Formative -- Students will be introduced to order of operations through a series of examples with the use of white boards.

Post-Assessment:

Formative assessment -- Students will use their newfound skills by doing the "Order of operations bingo" with the aid of filling out a worksheet to show their work.

### Stage 3: Build Learning Plan

**Set (Engagement):****Length of Time:** 10 mins

Set the chips, graph paper, and loose paper on the table for the students to optionally use.

The teacher will begin by giving the students a word problem without any instruction to see if the students can find the solution without any help. 2-3 word problems (using kids names / things they can relate to). Allow the students to have the option use the chips, graph paper, and loose paper.

What is a whole number?

What is an expression?

What is an equation?

**Development:****Time:** 15 mins

Giving examples of order of operations expressions (both numerically and word problems) 4 numerical, 4 word  
Give questions with and without the use of calculators.

What is the difference between an expression and an equation?

How can I analyze errors? By looking back at our work and searching through each step to find the error.

How can I use repeated addition and subtraction for multiplication and division? (By following BEDMAS from left to right)

Why can't we always depend on calculators for these equations? (Only specific calculators follow the order of operations so we can't always depend on technology to get us to a correct answer.)

**Learning Closure:****Time:** 35 mins

Order of operations bingo activity

-Hand out the show your work questions and bingo cards.

Allow the students to answer the questions with the teacher being present if students need any help.

-As the students answer their questions, the answer will give them a number to colour in on their bingo card.

-The first student who creates a line across with their solutions wins.

Allow students to work on the math makes sense worksheets p. 70-73 (excluding #1 a-l) or p. 26 & 27 if time is leftover.

**Materials/Resources:**

- White boards
- White board markers
- Pencils
- Graph paper
- Chips
- Loose paper
- Bingo worksheet & show your work
- Order of Operations ...
- Differentiated bingo worksheets
- Math makes sense worksheet p. 26&27
- Order of operation le...

**Possible Adaptations/  
Differentiation:**

- Give students opportunities for one on one problem solving to ensure student understanding (teacher-student aid)
- Allow students the use of calculators, graphing paper, and chips to answer aid in visualizing/answering the questions

**Management Strategies:**

- Make sure the students are updated on their timelines between each activity in order to provide them with time management.
- Model ideal behavior
- Clap once – to get the students attention

**Safety Considerations:**

- Ensure the students know not to eat the expo markers.

### Stage 4: Reflection

