

**Grade 5
Growth Patterns**

**Use at the end of
Investigation 2**

Vocabulary
order of operations
exponent

Materials
Student Activity Sheet

**NYS
Performance
Indicator**
Substitute assigned values
into variable expressions
and evaluate using order
of operations (5.A.3)

ACTIVITY: Order of Operations

When an expression contains more than one operation, you can get different answers depending on the order in which you solve the expression. Mathematicians have agreed on a certain order for evaluating expressions, so we all arrive at the same answers. We often use grouping symbols, like parentheses, to help us organize complicated expressions into simpler ones. Here's the order we use:

1. First, do all operations that lie inside parentheses.
2. Next, do any work with exponents.
3. Working from left to right, do all multiplication and division.
4. Finally, working from left to right, do all addition and subtraction.

In Example 1, without any parentheses, the problem is solved by working from left to right and performing all the addition and subtraction. When parentheses are used, you first perform the operations inside the parentheses, and you'll get a different answer!

Example 1 - Parenthesis

Without Parenthesis	With Parenthesis
$8 - 7 + 3 = 1 + 3 = 4$	$8 - (7 + 3) = 8 - 10 = -2$

Example 2

Order of Operations	Explanation
$2^2 \times 20/4 - 7 \times 3 + 55 =$	Calculate the exponent
$4 \times 20/4 - 7 \times 3 + 55 =$ $4 \times 5 - 21 + 55 =$ OR $80/4 - 21 + 55 =$ (4 x 5 and 80/4 both = 20)	Working from left to right, do all multiplications and divisions. When there are several of these operations in the same term, the order within the term doesn't matter
$20 - 21 + 55 =$	Add and subtract from left to right
54	The correct answer!

Answer key (for Student Supplemental Activity):

- 1.) 84 2.) 14 3.) -20 4.) -27 5.) 18