

Stage 1 – Identify Desired Results

Established Goals:

- CCSS.MATH.CONTENT.6.EE.A.1
Write and evaluate numerical expressions involving whole-number exponents.
- CCSS.MATH.CONTENT.6.EE.A.2
Write, read, and evaluate expressions in which letters stand for numbers.
- CCSS.MATH.CONTENT.6.EE.A.3
Apply the properties of operations to generate equivalent expressions.
- CCSS.MATH.CONTENT.6.EE.A.4
Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them).
- CCSS.MATH.CONTENT.6.EE.B.6
Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
- CCSS.MATH.CONTENT.7.EE.A.2
Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related.
- CCSS.MATH.CONTENT.7.EE.B.3
Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically.

What essential questions will be considered?

- What is the purpose for an established order of operation?
- How do algorithms and mathematical expressions help us solve real-world problems?

What understandings are desired?

Students will understand that...

- Mathematical expressions provide a common “language” for mathematicians to use.
- Algorithms provide a repeatable method for achieving a result.

What key knowledge and skills will students acquire as a result of this unit?

Students will know...

- key terms – equation, algorithm, variable
- the rules for mathematical and algebraic order of operation

Students will be able to...

- simplify and solve mathematical and algebraic equations.
- translate simple algorithms into mathematical notation

Stage 2 – Determine Acceptable Evidence

What Evidence will show that students understand?

Performance Tasks

- Students will develop a puzzle using their method of choice (paper, Scratch, etc.) with rules that allow everyone to follow the same path.
- Students will then translate that puzzle into a mathematical representation.

What other evidence needs to be collected in light of Stage 1 Desired Results?

Other Evidence

- Practice equations – order of operations
- Practice equations – simplifying equations

Student Self-Assessment and Reflection

- Self-assess practice equations
- Peer review algorithm design and then self-assess based on peer feedback

Stage 3 – Learning Plan

Learning Activities

- Watch video in foreign language and discuss why it would be difficult to communicate in a foreign country **(H)**
- Discuss how mathematical equations allow everyone to achieve predictable, repeatable results. **(W)**
- Work a maze and/or game with rules to follow to arrive at the end, discuss how those rules can lead everyone to the goal **(H,E)**
- Students develop their own puzzle with rules so everyone can follow the same path **(E,T)**
- Students will work each other's puzzles and provide feedback. Was everyone able to achieve the same result? **(E2)**
- Students revise their work before submitting assignment **(R)**
- Using mazes and games from previous lesson, translate to mathematical notation **(W)**
- Read lesson, view videos, and review sample equations demonstrating order of operations **(W)**
- Read lesson, view videos, and review equations with a variable substituted for a number to demonstrate order of operations **(W)**
- Read lesson, view videos, and review sample equations demonstrating simplifying equations **(W)**