Math & Science Collaborative Lesson Plan

Northwest Educational
Service District 189
Together We Can

Lesson Title: Order of Operations Lesson

Unit Learning Target (Standard/Performance Expectation(s))	6.2.D	*CCSSM 6.EE.3*
Apply the commutative, associative, and distributive properties, and use the order of operations to evaluate math expressions		

Building Block or Lesson Learning Target:
   Apply the Order of Operations to evaluate algebraic mathematical expressions ( ), x^2, •, ÷, +, -

Previous Lesson Learning Target:
Solve variable expressions when a value is given for each variable by using the commutative, associative, or distributive properties

Student Success Criteria:
Given an equation without operations, students will fill in the operations in order to make the equation a true statement!

Target Introduction/ Thinking Question ∗   Will solving an expression in any order give you the same and correct values?

Lesson Progression (Flow) with Talk-Structures (Student Discourse)

Student groups solve equations using playing cards and dice that have various operations on their faces. Lay out 3 cards and roll 2 operational dice to find the greatest values. (This helps students understand how solving in different orders will give different values.)

Student teams share with the class, what they have discovered about operations.

Give the students equations missing the operations and work with partners to solve them.

Proceed with a class discussion on what they discovered about the operations.

Students work together to determine the correct order of operations.

Key terms for this lesson
variable, commutative, expression, distributive, associative, order of operations, property, non-negative, decimal, sum, difference, product, quotient

Formative Task or Question*
Designed to elicit student misconception(s)
Does it matter which operation you do first?
How do you remember which operations come first?
Is multiplication always done before division, and addition always done before subtraction?

Forms of Student Discourse to include:
Student to teacher
Student to student
Student to small group
Small group to large group

Lesson Closure
Acronym for remembering the **Order of Operations**
       Please Excuse   *My Dear*   **Aunt Sally**   (PE *MD* AS)
(Powers & Exponents then *Multiplication & Division* then **Add & Subtract)**

Exit Task*

Students complete the assigned exit task

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Do the Math for the Thinking Question

| 3 | • | 2 | + | 7 | = | 13 |

| 3 | + | 2 | • | 7 | = | 35 | or | 17 |

} The values will be different based on what operation the student does first!

(Students lay out cards and roll dice to place in the operation boxes between numbers)

$24 \square 6 \square 2 \square 1 = 13$

(Students place the correct operations to make the equation true.)

Lesson Anticipated Misconceptions:

Can add or multiply from left to right if the • is not confined within ( ).

Thinking multiply always comes before divide.

Thinking add always comes before subtract.

Thinking parenthesis are always before exponents.

Forgetting to always work inside out.

Lesson Instructional Adjustment(s) (if needed)
Tied to common misconception(s)

Manipulatives and materials to include and have ready to support the lesson *

* Opportunity for formative assessment