Order of Operations

Lesson Overview

In this lesson, students will review order of operations using Agree/Disagree Statements.

Standards Addressed

6.EE.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). For example, the expressions y + y + y and 3y are equivalent because they are the same number regardless of which number y stands for.

Disciplinary Literacy Best Practices

Agree and Disagree Statements
Exit Ticket

Lesson Plan

Time Required: One 60-minute Class Period

Disciplinary Vocabulary: order of operations, exponent, expression, equation, variable

Materials Needed:
Pre-made A & D Statements for specific topic (1 per student)

Assessment:

A/D Statements, Student Dialogue

Engage

- Students are asked, "How can you represent numbers in different ways?"
- Students are continuing to work on representing numbers in different ways. For instance, 2 x 2 = 4 x 1. Students continuing building on to expressions to represent different numbers. For instance, 16 = 8 x 2, 4^2, (2 x 4) + 8, 8 + (8 x 1), etc.
- Learning how to represent numbers in different ways leads into order of operations.

Explore

- Explain the process of Agree and Disagree Statements to students and that they will first explore these mathematical statements individually to review order of operations.
- Students are given a set of mathematical statements representing following the order of operations. Students are given a set amount of time to decide whether or not they agree, disagree, depends on, or not sure about the given statement.
- With each statement, students must jot down their thoughts about their answer to the statement.

Explain

- Students are then paired with another student to dialogue about each mathematical statement.
- Pairs discuss what they checked (agree, disagree, it depends on or not sure) and explain/justify why they chose that category.
- Once pairs dialogue, if there is a disagreement, they are to decide if they can come to an agreement and make any necessary changes.

Extend

- Bring the class back together as a whole to dialogue about A/D Statements.
- For each mathematical statement, have students stand for the chosen category to get a quick assessment of the class. For example, after reading number 1, ask students to stand if they chose *agree*, then *disagree*, followed by *it depends on* and finally *not sure*.
- Have students justify why those have checked those categories OR perhaps they have changed their thinking now after talking with a partner.

Exit Ticket: Write on a notecard, scratch sheet of paper, post-it note (etc.): How do you feel about today's activity? Why?

Teacher Reflections and Biographical Information

A & D Statements were a great way to review order of operations. A & D Statements allow students a chance to not know an answer and it be okay. I placed limitations on using "not sure." I did not want students to choose it to be finished quicker. I also believe the next time I use A & D Statements, I will make sure the students write what their thoughts are as to why they chose the answer they chose. Overall, I believe this lesson went well. As with any lesson, you may need to modify and adjust to suit your students.

Lesson Author:

Christy Junkins, 6th Grade Mathematics at the Middle School of Pacolet, Spartanburg School District 3 located in Spartanburg County, SC.

Order of Operations A & D Statements **Name:** _____ **Date:** _____

Statement	How can You Find Out?	Explanation
1. $2 + 3^2 \bullet 7 - (10 - 4) = 38$ ____agree _____ disagree _____ it depends on ____ not sure My thoughts:		
2. $2 + 4y \leq 22$ is an inequality. ____ agree _____ disagree _____ it depends on ____ not sure My thoughts:		
3. $15 + 6y = 56; y = 5$ ____ agree _____ disagree _____ it depends on ____ not sure My thoughts:		
4. $11 + 48 \div 6 \bullet 4 = 43$ ____ agree _____ disagree _____ it depends on ____ not sure My thoughts:		
5. Kangaroos can cover 30 feet in one jump! If a kangaroo could jump like that *x* times in a row, he would need to jump 746 feet more to cover a mile. (1 mile = 5,280 feet) ____ agree _____ disagree _____ it depends on ____ not sure My thoughts:		