

Unit Plan: Deepening Understanding of the Order of Operations

A Common Core-Aligned Lesson Plan to use in your Classroom

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The activity

Students will connect their prior, real-world knowledge to the concept of order in mathematics. They will go through a discovery process with content that will build a deep, conceptual understanding of **why we perform operations in a certain order** when we see just the naked numbers. This lays the foundation for higher levels of mathematics.

Students will gain conceptual understanding of the Order of Operations, write numerical expressions and equations including those with variables and exponents, build procedural skill and fluency useful for algebra, and apply their knowledge of real world problems to this mathematical context.

Students will

Learn the following Common Core State Standards, and utilize the following resources:

#	Lesson Title: What is the name of this lesson? What activities are involved?	Duration: How long is this lesson expected to last?	Standard: What CCR Standard(s) does this lesson address?	Resources: What books, equipment, video, or presentation do you need to deliver the lesson?	Materials: What handouts, manipulatives, or other materials do you need to deliver the lesson?
1	Exploring Order in Mathematics	35 minutes	1.OA.3, 3.OA.5, MP.3, Shift 1 - Focus	PowerPoint: "Exploring Order in Mathematics"	Materials: Order Cards
2	Essential Question #1 – Why are Multiplication and Division Done before Addition and Subtraction	45 minutes	1.NBT.4, 2.NBT.7, 2.NBT.9, 3.OA.1, MP.2, MP.7, Shift 2 - Coherence	Video: "One is One... or is it?" PowerPoint: "Why are Multiplication and Division Done before Addition and Subtraction?"	none

3	Exploring the Natural Order of Operations with Bingo Chip Arrays	45 minutes	2.OA.4, 3.OA.1, 3.OA.5, 5.OA.1, 5.OA.2, 6.EE.1		Materials: “Number of Candies” photograph, bags of bingo chips or pennies
4	Essential Question #2 – What is the Connection between the Distributive Property and the Order of Operations?	50 minutes	3.OA.5, 3.OA.9, 3.MD.7c, 6.EE.3, MP.4	PowerPoint: “What is the Connection between the Distributive Property and the Order of Operations?”	<i>none</i>
5	Writing Expressions for Real-World Arrays	1 hour	3.OA.1, 3.OA.5, 5.OA.1, 5.OA.2, MP.6		Materials: file of photographs, file of group record sheets (optional)
6	Building Procedural Skill and Fluency with the Order of Operations	1 hour, 45 minutes	3.OA.5 (Properties of Numbers Challenge), 6.EE.1, 6.EE.3, 6.EE.4, MP.7, MP. 2, Shift 3 – Rigor	Video: “The Order of Operations is Wrong... Morally Wrong that is”	Handouts/Materials: calculators, dice, pennies, markers, 24Game (optional), handouts: <i>Graduation Celebration, Expressions and Array – Card Match, Order of Operations – Dice Game, Properties of Numbers Challenge, Thirty-Nine, Prove It! True or False, Find the Missing Number, Grouping Symbols, and Creating True Equations</i>

- 1) **Essential Questions:** What big questions will guide this unit? What are the overall themes?

Overall Theme: Deepening Understanding of the Order of Operations

- Essential Question #1 – Why are Multiplication and Division Done before Addition and Subtraction?
- Essential Question #2 – What is the Connection between the Distributive Property and the Order of Operations?

- 2) **Postsecondary Readiness:** How will this unit prepare students for college, career, or to become leaders in their family and/or community?

- Students who have a strong foundation of basic math skills that includes conceptual understanding are able to understand mathematics at higher levels.

- 3) **Evidence of Learning (Summative Assessments):** How will you assess what students learned throughout the unit? Examples of assessments include cumulative projects, speeches, portfolios, Power Point presentations, and final exams.

- Students will provide written answers to the essential questions after two of the lessons.
- The final lesson is full of practice sheets and activities that will demonstrate each student's level of understanding.
- Student interaction, class participation, and class work can be observed throughout the lessons.

- 4) **Resources:**

- All resources that would provide evidence of learning are used (and listed) within the lessons themselves.