

I. What do we want to learn from this lesson? (*Research Lesson Goals for Teachers*)

Do students have a better understanding of large numbers and scale by using models?

II. The overarching Lesson Study goals are:

To help students have a greater understanding of large numbers.

Steps of Research Lesson	Students	Teacher	Evidence of student learning/engagement	Observer’s Comments: Things to think about for next time
<p>Building a context for the lesson <i>(Connecting to meaningful things or previous lesson)</i></p>	<p>Doing: Brainstorming the jawbreakers size in relation to various planets.</p> <hr/> <p>Possible Questions or Misconceptions: All planets are the same size, the same size of the earth.</p>	<p>Doing: Use jawbreakers to represent planets Review previous knowledge of planets. Mnemonics for planets.</p> <hr/> <p>Possible Responses/ Questions to Pose: If the sun were the size of the classroom which jawbreaker would be the earth?</p>		
<p>Laying the framework for the learning experience <i>(Launching the activity)</i></p>	<p>Doing: Working in groups the students will be observing the numbers.</p> <hr/> <p>Possible Questions or Misconceptions: What are we going to do with these?</p>	<p>Doing: Pass out balls without discussing comparison of numbers in relationship to the size of the balls. Hand out worksheet. Have students (in groups) identify which ball represents which planet.</p> <hr/> <p>Possible Responses/ Questions to Pose: If the sun were the size of a classroom, what planets would each of the balls represent according to its size? What will help us figure this out?</p>		
<p>Engaging students with concepts <i>(Exploring, investigating, problem solving)</i></p>	<p>Doing: Round the numbers and list them from least to greatest. Hypothesize which planets are represented by which ball. Share with class.</p> <hr/> <p>Possible Questions or Misconceptions: Incorrect understanding of place value.</p>	<p>Doing: Discuss rounding. Pass out papers with measurements. Determine that students know which numbers to compare. Discuss place value and number comparison. Have students list numbers from least to greatest.</p> <hr/> <p>Possible Responses to student questions and/or strategies: What is our largest planet?</p>		
<p>Sharing ideas/solutions <i>(Whole group, small group, written)</i></p>	<p>Doing: Comparing numbers and sizes of the balls. Test hypothesis by number comparison in relationship to the size of the balls.</p>	<p>Doing: Observing group work.</p>		

	<p>Possible Questions or Misconceptions: Just because the first (left hand) numbers is larger, the size is larger.</p>	<p>Possible Responses to student questions and/or strategies:</p>		
<p>Closure/Summarizing <i>(Tying ideas together – summarize what math/strategies were learned)</i></p>	<p>Doing: Share results with class. Discuss math concepts applied. Final conclusions about the size of planets. Possible student responses to 1st question: Large numbers Rounding Comparing Ordering</p>	<p>Doing: Looking for and clarifying misunderstanding. Discuss what math strategies they used to come to their conclusions.</p>		
	<p>Possible Questions or Misconceptions: Wrong size ball to represent a planet.</p>	<p>Possible Responses/ Questions to Pose: What math did we use in Science today? Why did you choose this (show ball) for Pluto.</p>		