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Exponents and Scientific Notation Unit

LAP 2 Reflection

This lesson ended up lasting four days instead of two, since students needed more practice simplifying exponential expressions than I had originally anticipated. As a follow-up to the teaching presentations, we took notes as a class on all the different rules they had taught each other. Every time I give notes, I don’t feel satisfied with how I do it. I hate that I always structure them so that it’s so much teacher-centered time, yet then I don’t change the way I structure them the next time. For this unit, I think I could have easily made notetaking less teacher-centered by giving students a notes template to fill in during each mini-lesson. I didn’t work this into the unit plan because I thought that it would be overkill to have them do that in addition to the worksheets, but I actually think it would have made the teaching component even more realistic if the students also had to take notes. Then we could have just gone over their filled-in templates as a class and discussed any lingering questions they had, instead of having me stand up there while students wrote down all the rules and examples their classmates had already taught them. However, a valuable part of me giving notes to the class was that I was able to provide explanations of the rules that not all the teachers included in their mini-lessons. If students filled out a notes template for themselves, I would want to make sure to still provide explanations, and maybe include a space on the template for that, when we went over it as a class.

Anyway, after we took notes, students spent the rest of the class and the next day working on worksheets that involved simplifying exponential expressions. Students were most confused with writing negative exponents as a fraction with 1 in the numerator. I showed them an explanation of this – you have more factors in the denominator than the numerator so that after you cancel out common factors you end up with 1 in the numerator and the remaining factors in the denominator – multiple times, but it was still hard for some of them to remember when they went to actually simplify the expressions. The next time I do this project, I will make sure that the students charged with teaching the negative exponent rule spend more time showing this explanation to their students. That way, students will encounter it more times and from the beginning.

As students worked on their worksheets, I was reminded of their work with solving equations. It was easiest to simplify the expressions if they broke them down into smaller pieces consisting of only one exponent rule, and then they could put the different pieces together. I reminded my students of that, which seemed to help them.

On the third day of the lesson, we only had 20 minutes of class because of the early release day. I knew that my students were growing tired of doing their worksheets, so on a whim, I decided to put them in an inner and outer circle of chairs and had them work with whoever was across from them to simplify whatever exponential expression I wrote on the board. The students kind of went along with it, and it was chaotic in a fun way. I’ve been wanting to try something like that with my 7th period, so this was a good very rough first attempt to help me realize the structures I would need to put in place to execute this effectively. First, I think I would move the tables, instead of just the chairs, so that they formed a square/circle. Students would sit on both sides of the tables to form the inner and outer “circle.” I would also give students a simple graphic organizer that had spaces for them to write down the problem, their work, and their partner for that problem. That way everyone would be held accountable for writing something down instead of leaving it up to one partner to do the work. For my numeracy class, I had one side of the circle rotate after every few problems, but I think I would have one circle rotate after every problem in my 7th period to keep them on their toes. In terms of showing the answer, I think that I would use the Elmo to display the work of a different pair after each problem. Maybe there would even be a space in the graphic organizer for students to write down if they solved each problem correctly or not, and then a space for them to write down the solution. This would make them pay attention as we discussed the solutions and it would make them correct their mistakes.

After this short experimental day, I had students work solely with negative exponents on the last day of the lesson. After seeing Kate do this with her students, I realized that I wanted to add this to my unit, since my students definitely needed more practice with negatives. My goal was for students to understand that the placement of a negative has a huge effect on an exponential expression. For example, 4^2, 4^-2, -4^2, and (-4)^2 each are calculated in a different way.

As a starter, I had students notice the pattern that a negative base raised to an odd power results in a negative answer, while a negative base raised to an even power results in a positive answer. After discussing this pattern and the difference between (-4)^2 and -4^2, students worked on a worksheet for the rest of class, but were pretty unfocused. At one point, I got annoyed at the lack of work and let them know that, and I moved a few students’ seats. Because the first short worksheet took them much longer than it should have, I assigned the second worksheet for homework. I never assign them homework, so they knew that I was disappointed. I felt similar to how I felt at one point during our distributive property unit when we had gotten so bogged down in skills work that my students had become unengaged. Noticing this helped me realize that we hadn’t done any real-world applications with exponents, so I planned a starter that used exponents in a real-world context for the next day’s lesson.