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Exponents and Scientific Notation Unit

LAP 1 Reflection

Because this unit began on a Monday, we started the first lesson with Team Love. This was the smoothest and calmest one yet, and my students said that they wanted to do it every class. I love that they have embraced this culture-building activity! I told them that while I love that they’re so into it, we just don’t have time to do it every class. Plus, I think compliments are more special when you don’t get them every day. Once we were finished, we moved onto introducing the You Be the Teacher project. The starter about good teaching provoked a lot of good discussion and thoughts that led nicely into my announcement that they were going to be the teachers for our next project. I had a lot of different documents and expectations to go over with them that period and they did a great job listening and asking questions. Having the project description, all the worksheets, and the rubric clearly laid out made it really easy to make students aware of the expectations. They seemed to respect my organization and readiness, and they especially liked seeing my own lesson plans. They were shocked that I put that much effort into planning their lessons; it was about time they realized/appreciated that!

Throughout the class, Felix was the only student who complained about the project. I told him that we could have a mature conversation about it later if he wanted, which silenced him. Danni refused to work with Rut, so I talked to him after class and told him he had no choice and that he needed to learn to work with other people. He claimed he didn’t want to work with Rut because she would make him fail, which was a laughable excuse. In terms of working on the project, most groups finished the noticing part of the What’s the Rule? sheet after the first day. Edward was noticeably engaged and excited to notice things, which was awesome to see!

The starter the second day proved to be a good quick way for students to review or learn the definitions of exponent-related terms. At the end of the starter, Danni asked me, “Why didn’t you just tell us all those definitions from the beginning instead of making us figure them out from your confusing diagram?” I told him that I think it’s more powerful for students to figure things out for themselves than for me to just tell them the information. This made me reflect on the idea of powerful learning. We talk about it all the time in our Clark classes, but how can we get our students to recognize and talk about it? How can I convince my students that doing an activity in a certain way is powerful? I think one way to do this is to ask them what powerful learning means to them, which is kind of what I did with the starter on the first day when I asked them what good teaching is. In the future, I want to find ways to have explicit conversations about what I believe powerful learning is and what they believe powerful learning is, and how we can merge those different understandings together in our classroom. Maybe then they would finally understand why I don’t just give them worksheets like they ask me to!

Returning to the topic of exponents, all the groups finished their What’s the Rule? sheets on the second day of the unit. Most of them struggled on the last part of the worksheet that asked them to generalize their exponent rules using variables, which I expected. I ended up working with each group individually and they eventually got it. The next time I do this project, I think I should do some sort of starter or activity that has students rewrite expressions using variables. Perhaps we could do a review of the different addition axioms, which are always good to know anyway, and practice writing them using variables. For example, the additive identity tells us that any number plus zero gives us that same number. I could give my students examples of this with real numbers, and then ask them to generalize it using a variable and zero (such as a + 0 = 0 + a = a). If students worked through generalizing a few of these axioms before they were faced with exponents, I think they would be more comfortable writing generalizations of their exponent rules.

Throughout the period, Felix’s negative attitude from yesterday continued and rubbed off on his partner, Kenzie. When I made my way over to them towards the end of the period (I had told them earlier I was not going to help them until they had tried some of the worksheet themselves), I realized that their resistance was partly coming from a lack of understanding. They were struggling to understand the negative exponent rule, which was one of the harder rules considering that it required them to teach themselves the quotient rule in addition to the other parts of their rule. It had been a little while since I had encountered this attitude of not caring as a defense mechanism for not understanding; I had almost forgotten that this was common among students. Once I sat down with Felix (Kenzie had disappeared to the bathroom), I worked with him for about ten minutes to understand his rule and complete his worksheet. He was engaged the whole time and lost the bad attitude. This interaction with him was a good reminder to me to look for the root behind the behavior instead of just getting annoyed at the behavior itself.

 One addition I made to this project after I submitted my original unit plan was to include a Daily Progress Check-in sheet for each student, which they filled out at the end of each period. They wrote what they accomplished that day, what they would accomplish the next day, and any questions or comments for me. I also left a space for me to write comments to them. I am so glad that I decided to include that in the project, for it made it so much easier for me to keep track of each group’s progress. Not only did it allow me to monitor each group’s work, but it also gave me the ability to have individual conversations with 15 different students at once. In addition, it got my students to reflect on their accomplishments and to keep themselves on track with the project. Having the check-in sheet for a specific project was much more manageable then doing it every day, which I tried to do with my students for a while earlier this year. Because of the success of this check-in sheet, I plan to use one for future projects as well.

 On the third day of the lesson, I saw lots of students feeling successful as they worked on their lesson plans. Raymond really stepped up to Gina’s level and was working hard, which made me glad that I had paired them together. They both kept bringing up great points/questions about the project that I then shared with the class, and I gave them some candy at the end as a reward. Luis was really engaged as he worked with Fernando on their lesson. He made some awesome non-examples for the product rule that showed someone multiplying the bases instead of adding the exponents, and he seemed really proud when I complimented him on them. After realizing yesterday that Felix needed some help, I made sure to spend some more time with him helping him figure out how to best explain his rule.

Danni had gotten over himself yesterday had started working with Rut, but they were progressing more slowly than they should have been since they relied on me too much. For example, they had a question about their sheet, but I was helping other groups when they called for me. In the 10-20 minutes it took me to get over to them, they hadn’t done anything because they were just waiting for me. How do I break that cycle of dependency and get them to take the initiative to figure things out on their own?

 Although I had originally planned on giving students only one more day to get ready for the jigsaw, three students were absent from three separate pairs the next day, so I decided to give students two more days to finish up. Over those next two days, students finished planning their lessons and creating worksheets. A lot of students chose to write some examples and explanations on mini-whiteboards to use during their mini-lessons, since they realized that just saying their rule out loud would not be enough to teach their classmates. It was great to see students thinking that through! On the second day, I told students that everyone needed to practice their mini-lessons at least once, and I was happy to see most of them taking their practicing seriously. As I was watching my students practice, I noticed that some of them didn’t go in depth into the explanations of their rules. I was counting on other students to ask some thoughtful questions during the mini-lessons to push teachers to explain more, which ended up happening for the most part. Perhaps the next time I do this project, I should put some sort of thoughtful question requirement on the rubric to ensure that that happens, instead of leaving it up to chance.

 After five days of work, it was finally time for students to teach each other their exponent rules! I split the class in half and put them on opposite sides of the room. The next time I do this, I would make sure to set up the two groups a little further apart, since the noise from one group interfered with the other group at times. In my unit plan, I had allotted ten minutes per mini-lesson. In reality, most mini-lessons took five minutes or less, including students completing the worksheets. Students didn’t really make their mini-lessons creative or engaging, and I realized that asking them to do with such a quick exponent wasn’t quite realistic or necessary. In the end, I was totally fine with the lack of creativity, since they still accomplished the ultimate goal of the project: to learn and teach the exponent rules.

After the first day of mini-lessons, one group was finished all their mini-lessons while the other group had two more to go. The next day, half the class was pulled out for an assembly, which actually worked out perfectly because those were mostly the students in the group that had already finished. For that group, I noticed that the teachers hadn’t provided much explanation of their rules and the students were eager to go on to the worksheets. They asked each other more clarifying questions during the worksheets than during the mini-lessons. The other group did the opposite, asking the teachers more questions about the “why” as they were teaching. Based on the academic tendencies of the individual students in each group, this made sense to me. Over the two days, I was especially thrilled to see them help each other with the worksheets and provide good explanations when asked. Whenever students asked me for help, I redirected them to their peers. I was mostly just filming the whole time; I didn’t really have anything to do, which was a great feeling and what I consider to be a sign of a truly student-centered activity.

 When all the mini-lessons were done and the students had returned from the assembly with ten minutes left in the period, I had them complete a project reflection and turn in their grade sheets with their classmates’ worksheets grades. And with that, our teaching project came to a close.