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|  | **Instructional Support***What tools or resources will students have to use in their work that will give them entry to, and help them reason through, the activity?*   |  |
| **Task***What is the main activity that students will be working on in this lesson?*  | Students will be guided through each chart with 1 completed sample problem, and one half completed sample problem. This way, they will know what their entries should “look like”. Being that this is the 1st lesson of this unit, the only resources students will have will be their own prior knowledge, and the prior knowledge of their partners, if they choose to work in groups. Some students may also use section 8.1 of the textbook to help support their learning, if they so choose.  | **Learning Goals (Residue)***What understandings will students take away from this activity?*  |
|  Students will be investigating “products of powers” and “powers of powers” by developing the “rules” for simplifying exponents. They will use a worksheet that asks them to represent expressions with powers as repeated multiplication, and then asked to find a pattern that relates the exponents from the expressions to the exponents in the simplified expression. In this activity, students will also be working on combining like terms.The final problem on the homework is meant to be a challenge problem, being used for discussion the next day. Students will be asked to graph a linear equation and an exponential equation on the same coordinate plane, and asked to compare/contrast the two. | Students will take away the understanding that finding products of powers is not arbitrarily adding the powers, but that it is more about combining like terms, and adding the total amount of like terms and assigning the appropriate power to represent the amount of those terms. Same goes for finding powers of powers. Students will understand that they are not arbitrarily multiplying the powers, but that each power represents a particular number of terms. I also hope that students will move from writing out the expanded expression, and onto using the patterns and “rules” they develop instead. |
| *What questions might you ask students that will support their exploration of the activity and* ***bridge*** *between* ***what they did*** *and* ***what you want them to learn*** *(the two green boxes)?* To be clear on what students actually did, begin by asking a set of assessing questions such as: What did you do? How did you get that? What does this mean? Once you have a clearer sense of what the student understands, move on to appropriate set of questions below. |
| *What are the various ways that students might complete the activity?*   | What do the powers tell us? If I say “2 to the 3rd power” what does that mean?*When looking from 1st column to last column—*How do you get 6 when you have 3 and 2 ($ \left(5^{3}\right)^{2} )$ ? How do you get 9 when you have 4 and 5? ($7^{4}·7^{5}) ?$ How do we see this in the repeated multiplication?*For students who are struggling to combine like terms and simplify with exponents on the 3rd chart—*How many 5’s are there? How many x’s are there? How many y’s are there? How can we use exponents to describe the number of terms we see, instead of having to write out all of the 5’s, x’s, and y’s? | **Evidence***What will students say, do, produce, etc. that will provide evidence of their understandings*?  |
| Because my students vary greatly with their prior knowledge, I expect that some students will ignore writing the expression as repeated multiplication, and instead move immediately towards applying the rules they have learned already. I also expect the reciprocal of this—where students will depend on the repeated multiplication and have difficulty moving to using the patterns and rules they observe.  | Students will complete 6 practice problems on their own, using the patterns and rules they developed during class in order to simplify the expressions. In order to accommodate those students who struggle (according to their IEP) with writing, I will prompt them verbally for questions 2,4, and 6 that asks them to write the pattern they see from the 1st column to the last column. Homework will be spot-checked and collected the following day. |