

- 1) Benchmark Standard
 - a) CCSS.HSA.SSE.B.3 – Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
 - b) Math Practice Standards
 - i) MP3 – Construct viable arguments and critique the reasoning of others.
 - ii) MP7 – Look for and make use of structure.

- 2) Behavioral Objective

The learner will be able to simplify monomials with exponents.

- 3) Anticipatory Set
 - a) On the board I will have three terms: x^3 , 2^4 , and $\frac{6ab}{ab}$. I will ask students if they know any equivalent terms.
 - b) I will note (if not noted by students) that the first two terms can be expanded (definition of exponent) and the third term can be simplified.

- 4) Objective//Purpose

“We have just completed several lessons on factoring polynomials. We will now work with polynomials in ways other than factoring. Specifically for today, we will be looking at the multiplication and division of single term polynomials, AKA monomials.”

- 5) Input
 - a) Task Analysis:
 - i) Pass out activity paper. Begin Think-Pair-Share solving problems individually and thinking about patterns. Then pairing up to share thoughts about patterns or shortcuts followed by class discussion of shortcuts found.
 - ii) After first set of questions is through the think pair share, put up plicker question and have class answer after no longer than 30 seconds.
 - iii) After second set of questions is through the think pair share, put up new plicker question with no longer than 45 seconds to answer.
 - iv) After third set think pair share, put up new plicker question with no longer than 45 seconds to answer.
 - v) Collect activity papers.
 - vi) Create theorems from the patterns the class has come up with. I will lead this part to ensure the symbols and everything is correct.
 - vii) Look at examples of the division of monomials in textbook. In short, we do another set of problems as before but I lead it and find the pattern for division of monomials.
 - viii) Using the pattern I have found, work through more problems with the pattern and see if it continues to work even with more complicated examples.
 - ix) After completing examples, create theorems from the patterns and make it clear that those theorems are what is important to remember for the future.
 - b) Thinking Level:
 - i) Application – Determine simplified versions of monomials
 - ii) Analysis – Connect different examples into one similar pattern.

- iii) Evaluation – Compare your work with your neighbors and defend your position while criticizing theirs.
- iv) Synthesis – Create shortcuts to make it quicker and easier to do similar problems in the future.
- c) Method and Materials:
 - i) Method – Think individually, pair with a neighbor and discuss, then share thoughts and findings in class discussion.
 - ii) Lecture and modeling – Model how to use the patterns we have found to simplifying more complicated examples of monomials.
- 6) Checking for Understanding:
 - a) During each question set I will be looking quickly at what groups are discussing and listening for different methods and misconceptions.
 - b) At the end of each question set a question will be put on the board that everyone must answer and I will scan their answers using plickers. Will make sure everyone is ready before moving to next question set.
 - c) Before everyone leaves they will answer number 10 from the homework on plickers.
- 7) Guided Practice:

The question sets are in order of increasing difficulty. During easiest set I will help with any questions or concerns and in later sets I will be available by try to help less and less so they can discover the patterns for themselves.
- 8) Independent Practice:

Students have 12 questions to complete independently during class or at home.
- 9) Closure:

After going through examples and modeling how to work through them, I will write down the four patterns that were discovered and discussed during the lesson. These patterns are the things that we will be using in future lessons and should be the focus of learning.