Sequencing Rationale

Over the course of my teaching, I have found that even though exponent rules are introduced to students in eighth grade, they are truly not ready to apply them until they have reached a higher level of maturity. As freshmen in Algebra 1, you would think that only a brief review of exponent rules is needed, but that is not the case. I chose to sequence my unit into three subunits because that is what my students need in order to be successful. We cover each subunit in depth and through a variety of learning activities in order to reach all learners. Whether these students are visual, auditory, or hands-on learners, they are able to develop a firmer grasp of exponents and exponential functions simply because this unit caters to all three learning types.

Subunit one covers the rules of exponents. Students are provided with the multiplication and division rules as well as the definitions of special cases such as zero and negative exponents. They are asked to complete homework problems and participate on the Smartboard in order to increase their level of comprehension. Students are also expected to watch brief videos that further explain how to apply these rules in order to evaluate problems that involve exponents. They are also given a video that sets the rules to music to help the students remember when to add exponents, when to subtract them, when they equal one, as well as when they turn into fractions. Each activity in this first subunit is designed to help students understand the purpose behind learning exponents. This subunit takes between five and seven days to cover. We begin with the pre-assessment, move on to the notes, homework, board participation, and quizzes. We conclude this subunit with the formative assessment.

Subunit two covers the rules of scientific notation. This is the second subunit because students must understand the rules of simple exponential expressions before they can be expected to compute them. Understanding how to multiply and divide exponents is essential because this subunit expects students to draw upon what they already know about exponents and apply it to real world problems that involve extremely large numbers or numbers less than one. Notes are provided for this section as well as board participation, homework, and a quiz. This part of the subunit usually takes two-three days for mastery.

The final subunit is exponential functions. This subunit is where the majority of the time is spent because the majority of the real world problems are modeled by exponential growth and decay equations. We discuss how to graph simple exponential functions using a table. We then move on to the formulas associated with exponential growth and decay. We discuss the differences between the two as well as the types of story problems that utilize each formula. We discuss animal populations and compounding interest in terms of exponential growth. We then move on to discuss the depreciation of vehicles and the progression of teams to the final four such as in March Madness. After the notes have been presented and the videos have been watched, the students begin to synthesize all of their new found knowledge pertaining to exponents into a Google presentation. At this point, the students take part in a Web Quest where they conduct their own research, develop their own problems, and discuss the answers to those problems to their fellow students. This part of the unit usually takes between seven and nine days. Once the presentations have been given, and the class discusses them, the unit ends with the summative assessment.