**Algebra 1 – Unit 5**

**Exponential Functions**

**The Big Ideas**

This section begins with lessons that ask you to describe the growth of a rabbit population and the decreasing rebound height of a bouncing ball. You will use tables, graphs, and equations to represent the growth.

Also in this unit, you will investigate a family of exponential functions. You will recognize exponential growth when given situations, tables, graphs, or equations, and you will make connections between these representations. You will also extend your knowledge of exponents and their properties and learn how to use these properties, along with the algebra skills you already possess, to solve exponential equations. You will be introduced to step functions. At the end of the section, you will get to apply exponential functions to real-life situations involving growth and decay.

**Day One – (5.1.1) How does the pattern grow?**

**Objective -** Students will represent exponential growth with a diagram, table, and graph. Students will write descriptions of exponential growth based on the patterns in their tables, recognize patterns of exponential growth, and use their descriptions to make predictions.

**Agenda –** problems 5-1 to 5-4

**Homework –** 5-6, 5-7, 5-8, 5-9, 5-15 to 5-17

**Day Two – (5.1.2) How high will it bounce?**

**Objective –** Students will generate data and model the data collected with tables, equations, and graphs. They will calculate the rebound ratio when a ball bounces. Students will use this rebound ratio to investigate exponential decay, in a future lesson.

**Agenda –** problems 5-18 to 5-21

**Homework –** 5-16, 5-17, 5-22, 5-23a&b, 5-24a&b, 5-25c&d

**Day Three – (5.1.3) What is the pattern?**

**Objective –** Students will be introduced to an example of exponential decay and compare it to the linear function from the previous lesson.

**Agenda –** 5-28 to 5-31

- mini-quiz

**Homework –**[5-34, 5-36a, 5-37, 5-39](http://textbooks.cpm.org/bookdb.php?title=cca&name=5.1.3&type=lesson#5-34)**,** 5-45

**Day Four – (7.1.1) What do exponential graphs look like?**

**Objective:** Students will investigate the family of functions *y* = *bx*. They will make and justify statements about the behaviors of graphs in this family.

**Agenda:** Problems 7-1 to 7-4

**Homework:** 5 - 46**,** 5- 53**,** 5-54, 7-8, 7-10

**Day Five - (7.1.2) Multiple Representations of Exponential Functions**

**Objective:** Students will deepen and extend their understanding of exponential functions by examining the multiplier (“*a*”) and starting point (“*b*”) in different representations. Students will generalize the roles of *a* and *b* for the equation *y* = *a* · *bx*.

**Agenda:** 7-20 to 7-22

**Homework:** 5-54,5-69,7-24, 7-25, 7-27

**Day Six - (7.1.3) More Applications of Exponential Growth**

**Objective:** Students will use what they know about linear and exponential functions to investigate the relationship between simple and compound interest.

**Agenda:** 7-30 to 7-33

**Homework:** 5-78, 5-79, 5-80, 7-35, 7-36

**Day Seven - Test Day**