Algebra 1: Chapter 5

December 17 – January 18

Sequences

Chapter Guiding Question

When patterns are repeated, can I find shortcuts that lead to equations?

5.1	Growth
I will:	• Use tables, graphs, and equations to represent growth
I can:	• Represent Exponential growth • Use ratios • Express exponential decay graphically
Essential questions	• Does this situation have a linear growth or decay (constant slope)?

5.2	Arithmetic Sequences
I will:	• Categorize sequences • Learn specialized vocabulary used when discussing sequences • Create multiple representations for arithmetic sequences
I can:	• Generate a sequence • Generalize an arithmetic sequence • Write a recursive sequence
Essential questions	• What is my starting number in my sequence? • How does the term grow?

5.3	Geometric Sequences
I will:	• Compare growth of various sequences and recognize growth by multiplication and addition

	• **Compare sequences to functions**
I can:	• **Use multipliers to solve problems** • **Tell the difference between a function and sequence**
Essential questions	• **Is this a function or sequence?** • **Is this sequence growing linearly or exponentially?**

Mathematical Practices:

Practice 1	**Make sense of problems and persevere in solving them.**
Practice 2	**Reason abstractly and quantitatively.**
Practice 3	**Construct viable arguments and critique the reasoning of others.**
Practice 4	**Model with mathematics**
Practice 5	**Use appropriate tools strategically.**
Practice 6	**Attend to precision.**
Practice 7	**Look for and make use of structure.**
Practice 8	**Look for and express regularity in repeated reasoning**

CCS Standard(s):

F-BF.2. Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.★

F-IF.3. Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. *For example, the Fibonacci sequence is defined recursively by f(0) = f(1) = 1, f(n+1) = f(n) + f(n-1) for n ≥ 1.*

F-IF.6. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.★

F-IF.7e. Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.

F-LE.1a. Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.

F-LE.1c. Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.

F-LE.2. Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

F-LE.3. Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.

N-Q.2. Define appropriate quantities for the purpose of descriptive modeling.