Subject: Math Grade: 8 Unit #: 7 Title: Growing, Growing, Growing and Functions

UNIT OVERVIEW

STAGE ONE: Identify Desired Results

Established Goals/Standards

8.EE.A.1
8.EE.A.2
8.EE.A.3
8.EE.A.4
8.F.1
8.F.2
8.F.3
8.F.4
8.F.5

Long-Term Transfer Goal

At the end of this unit, students will use what they have learned to independently…
To develop their understating of exponential functions, one of the most important types of nonlinear relationships.
Students will understand a function as a relationship between two variables in which the value of one variable depends on the value of the other value. An input corresponds to exactly one output.

Meaning

Enduring Understandings
Students will understand that…
Students will develop their understanding of exponential functions through patterns in powers tables. They will expand these patterns to explore fractional exponents. The rules and patterns they develop will be used to write and interpret equivalent expressions including some expressed in scientific notation.

Students will develop an understanding of other functions as each input has only one output.

(Exponential functions)
- Represent an exponential function with a table, graph, or equation
- Make connections among patterns of change in a table, graph, or equation
- Determine the effects of the growth factor for an exponential function

(Equivalence)
- Develop the rules for operating with rational exponents and explain why they work
- Write, interpret, and operate with numerical expressions in scientific notation
- Write and interpret equivalent expressions using the rules for exponents and operations
- Solve problems that involve exponents, including scientific notation

(Functions)

Essential Questions
Students will consider such questions as…

How can expressions be rewritten into equivalent forms?
What is a function?
What is the main difference between a function and a relation?

		• develop proficiency in identifying and representing relationships expressed in problem contexts with appropriate functions and use these relationships to solve problems • analyze equations to determine the pattern of change in the tables and graphs that the eqution represent • represent functions and relations using tables, graphs, ordered pairs, mapping diagram, or verbal scenarios. • compare linear, exponential and other non linear functions	
		Acquisition	
		What knowledge will students learn as part of this unit? How can I recognize whether a relationship between the variables is an exponential function? What can I learn by studying a table or graph of the exponential function? What is the criterior for a relation to be a function?	*What skills will students learn as part of this unit?* • Develop rules for operativng with rational exponents • Write, interpret, and operate with numerical expressions in scientific notation • Write and interpret equivalent expressions using the rules for exponents • Solve problems that involve exponents, including scientific notation • identify functions and relations

STAGE TWO: Determine Acceptable Evidence	
	Assessment Evidence
Criteria for to assess understanding: *(This is used to build the scoring tool.)*	Performance Task focused on Transfer: No unit test
	Other Assessment Evidence • Self-assessments of learning targets • Teacher observations • Common assessment (task to be determined at 30 weeks)

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T, M, A *(Code for Transfer, Meaning Making and Acquisition)*	**STAGE THREE: Plan Learning Experiences**	
	Learning Events: Investigation 5: Patterns with exponents (5 days) In this investigation, scholars will develop rules for operating with exponents. They will begin by looking for patterns in powe tables. They will look for relationships among numbers in exponential form. These rules for exponents will also be used to write and interprent equivalent expressions including some expressed in scientific notation. • Problem 5.1: looking for pattern among expoents (A) • Problem 5.2: rules of expoents (M) • Problem 5.4: Operations with Scientific Notaiton (T) Supplemental work on functions • Problems analyzing tables, graphs and equations that represent relations to determine if they are functions and interpret the information these relations represent.	Evidence of learning: *(formative assessment)* • Reflection questions • Ace questions • Class work • Teacher observations