# Algebra II - Unit 6: Exponential and Logarithmic Functions Phoenixville Area School District 

## Stage 1 Desired Results

PA Core Standards: CC.2.1.HS.F. 1 Apply and extend the properties of exponents to solve problems with rational exponents.
CC.2.1.HS.F. 2 Apply properties of rational and irrational numbers to solve real world or mathematical problems.
CC.2.1.HS.F. 3 Apply quantitative reasoning to choose and interpret units and scales in formulas, graphs, and data displays.
CC.2.2.HS.D. 2 Write expressions in equivalent forms to solve problems.
CC.2.2.HS.D. 8 Apply inverse operations to solve equations or formulas for a given variable.
CC.2.2.HS.D. 9 Use reasoning to solve

## TRANSFER GOALS

Students will be able to independently use their learning to...

- Number Sense: Develop a sound foundation to demonstrate the value of numbers by describing their various representations, relationships, and patterns.
- Fluency: Demonstrate automatic recall of addition, subtraction, multiplication, and division of rational numbers.
- Problem-Solving: Persistently apply various problem-solving strategies and organized approaches to accurately understand and solve problems and provide evidence to support response.
- Reasoning: Demonstrate mathematical resilience and conceptual understanding through the use of vocabulary, written expression, graphical representation, and alternate strategies.


## Meaning

UNDERSTANDINGS
Students will understand that...

- Mathematical ideas interconnect and build on one another to produce a coherent whole.
- Various mathematical representations are useful for problem solving and communicating a solution.
- Tools and strategies are strategically selected and used to solve particular applications.
- Mathematical ideas must be communicated clearly in written, visual, or oral form.
- Mathematicians think about reasonableness throughout the problem-solving process.

ESSENTIAL QUESTIONS
Students will keep considering...

- What is the question asking? How do I get there?
- How do figures/quantities/numbers/ operations relate to one another?
- How do I create an equation/ representation that describes the problem situation? How do I know if I got it right? Is one representation more appropriate than another?
- What tools should I use here to be most efficient and effective?
- What counts as an adequate solution? Does my answer make sense?
equations and justify the
solution method.
CC.2.2.HS.C. 2 Graph and analyze functions and use their properties to make connections between the different representations.


## CC.2.2.HS.C. 4 Interpret

 the effectstransformations have on functions and find the inverses of functions.
CC.2.2.HS.C. 5 Construct and compare linear, quadratic, and exponential models to solve problems.
CC.2.2.HS.C. 6 Interpret functions in terms of the situations they model.

- Algebraic expressions, equations, inequalities, and functions (linear, absolute value, quadratic, polynomial, exponential, and logarithmic) are used to model relationships between quantities in realworld situations.
- Patterns and functions can be generalized and represented using; verbal models, tables, equations, and graphs.


## KNOWLEDGE <br> Students will know...

- How to graph, analyze, and solve exponential and logarithmic functions and equations
- How to write, solve, and interpret real world exponential growth and decay problems
- How to simplify, expand, and condense logarithm expressions


## VOCABULARY

- Exponential Growth/Decay
- Interest/Compound Interest/Continuous
- Horizontal/Vertical Asymptote
- Logarithm/Natural Logarithm


## Knowledge and Skills Acquisition

## SKILLS

Students will be skilled at...

- Writing, graphing, analyzing, and solving exponential growth and decay equations and functions through matching and open response questions
- Writing and solving exponential growth and decay real-world application open response questions and explaining solutions in terms of the problem's context
- Simplifying, expanding, and condensing logarithmic expressions through multiple choice, matching, and open response questions
- Solving exponential and logarithmic equations through open response questions


## Stage 2 - Evidence

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| Code <br> A/M/T | Evaluative <br> Criteria | Assessment Evidence |  |  |  |  |

