

# Unit 1: Algebraic Modeling

Content Area: **Mathematics**  
Course(s): **Algebra 3CP**  
Time Period: **Semester 1**  
Length: **11 weeks**  
Status: **Published**

## Standards

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MA.N-RN.A	Extend the properties of exponents to rational exponents.
MA.K-12.4	Model with mathematics.
MA.F-IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.
MA.F-IF.B.5	Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
MA.A-SSE.B.3c	Use the properties of exponents to transform expressions for exponential functions.
MA.F-IF.C.7e	Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
MA.F-IF.C.8a	Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
MA.A-REI.D.11	Explain why the $x$ -coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$ ; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

## Enduring Understandings

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Data can be represented in multiple formats (linear, quadratic, exponential, logarithmic).

Real life situations can be modeled by mathematical equations.

There are various ways to display data (bar graph, line graph, pie chart, etc) where certain graphs are more appropriate for a given situation.

## Essential Questions

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How is data organized so it makes sense mathematically?

What is an exponential relationship?

What is a logarithmic relationship?

How do we use the definition and properties of logarithms to solve exponential equations?

## **Knowledge and Skills**

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- graph linear, quadratic, exponential, and logarithmic functions.
- solve linear, quadratic, and exponential equations in the context of a word problem.
- solve logarithmic equations.
- convert between exponential and logarithmic forms of an equation.
- apply the properties of logarithms.

## **Transfer Goals**

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Apply the logic and reasoning of math to a broad liberal arts education.

## **Resources**

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Intermediate Algebra with Applications 5/6th ed by Aufmann/Barker/Lockwood

Online resources which include, but are not limited to: AP Classroom, Desmos, Class Kick, Delta Math, and Math XL.