# Unit 3 Exponential and Logarithmic Functions

Content Area: **Math**
Course(s): **Accelerated PreCalculus, CP PreCalculus**
Time Period: **Marking Period 1**
Length: **2**
Status: **Published**

## Unit Overview

This unit allows students to explore exponential and logarithmic functions, and their applications in real-world problems.

## Enduring Understandings

- Students will understand exponential and logarithmic functions, and use them to model real-life phenomena.

## Essential Questions

How do you write and graph exponential functions?

How do you recognize, evaluate, and graph logarithmic functions?

How do you rewrite logarithmic expressions to simplify or evaluate them?

How do you solve exponential and logarithmic equations?

How do you use exponents and logarithms to model a variety of situations

## New Jersey Student Learning Standards (No CCS)

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|---|---|
| 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.8b | Use the properties of exponents to interpret expressions for exponential functions. |

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|---|---|
| MA.F-BF.A | Build a function that models a relationship between two quantities |
| MA.F-LE.A | Construct and compare linear and exponential models and solve problems |
| MA.F-LE.A.1 | Distinguish between situations that can be modeled with linear functions and with exponential functions. |
| MA.F-LE.A.1a | Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals. |
| MA.F-LE.A.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). |
| MA.F-LE.A.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. |
| MA.F-LE.A.4 | Understand the inverse relationship between exponents and logarithms. For exponential models, express as a logarithm the solution to $ab$ to the $ct$ power = $d$ where $a$, $c$, and $d$ are numbers and the base $b$ is 2, 10, or $e$; evaluate the logarithm using technology. |
| MA.F-LE.B | Interpret expressions for functions in terms of the situation they model |
| MA.F-LE.B.5 | Interpret the parameters in a linear or exponential function in terms of a context. |

## Instructional Strategies & Learning Activities

- Provide access to online book
- Provide access to book pages and problems through Canvas
- Provide access to review keys
- Provide access to webassign as learning and reviewing tool
- Specific problems will be pulled out to to provide opportunities to extend their knowledge.
- Work on problem solving in a group setting

## Formative Assessments

- Daily homework checks
- Quiz
- Chapter Test
- Exit Tickets
- Warm-ups

## Summative Assessment

- Unit Test
- Unit Project

## Alternate Assessments

- Modified homework
- Modified quizzes
- Modified tests
- Modified projects

## Closure

- Low-Stakes Quizzes - Give a short quiz using technologies like Kahoot or a Google form.
- Have students write down three quiz questions (to ask at the beginning of the next class).
- Have students dramatize a real-life application of a skill.
- Ask a question. Give students ten seconds to confer with peers before you call on a random student to answer. Repeat.
- Have kids orally describe a concept, procedure, or skill in terms so simple that a child in first grade would get it.
- Direct kids to raise their hands if they can answer your questions. Classmates agree (thumbs up) or disagree (thumbs down) with the response.
- Have kids create a cheat sheet of information that would be useful for a quiz on the day's topic.
- Kids write notes to peers describing what they learned from them during class discussions.
- Have students fill out a checklist with the objectives for the day.
- Have students complete an exit ticket without putting their name on it. Hand back exit tickets the next day in class and have students correct as a warm up.
- Ask students to write what they learned, and any lingering questions on an "exit ticket". Before they leave class, have them put their exit tickets in a folder or bin labeled either "Got It," "More Practice, Please," or "I Need Some Help!"
- After writing down the learning outcome, ask students to take a card, circle one of the following options, and return the card to you before they leave: "Stop (I'm totally confused. Go (I'm ready to move on.)" or "Proceed with caution (I could use some clarification on . . .)"