



## Unit 5: Functions

Unit Length: 15 days

Domain: Arithmetic with Polynomials and Rational Expressions

- Cluster 9: Perform arithmetic operations on polynomials.

Domain: Interpreting Functions

- Cluster 18: Understand the concept of a function and use function notation.
- Cluster 19: Interpret functions that arise in applications in terms of the context.

Domain: Building Functions

- Cluster 21: Build a function that models a relationship between two quantities.
- Cluster 22: Build new functions from existing functions.

Domain: Creating Equations

- Cluster 13: Create equations that describe numbers or relationships.

Standards:

- \*HSA.CED.A.4:
  - Rearrange **literal equations** using the properties of equality.
- \*HSF.IF.B.6:
  - Calculate and interpret the **average rate of change** of a function (presented algebraically or as a table) over a specified **interval**; estimate the **rate of change** from a graph.
- \*HSF.BF.A.1:
  - Write a function that describes a relationship between two quantities: from a context, determine an explicit expression, a recursive process, or steps for calculation; combine standard function types using arithmetic operations. (e.g., given that  $f(x)$  and  $g(x)$  are functions developed from a context, find  $(f + g)(x)$ ,  $(f - g)(x)$ ,  $(fg)(x)$ ,  $(f/g)(x)$ , and any combination thereof, given  $g(x) \neq 0$ .); **compose functions**.
- HSA.APR.A.1:
  - Add, subtract, and multiply polynomials: understand that polynomials, like the integers, are **closed** under addition, subtraction, and multiplication.
- HSF.BF.B.4:
  - Find **inverse functions**: solve an equation of the form  $y = f(x)$  for a simple function  $f$  that has an **inverse** and write an expression for the **inverse** (For example,  $f(x) = 2x^2$  or  $f(x) = (x+1)/(x-1)$  for  $x \neq 1$ .) Verify by **composition** that one function is the **inverse** of another (Algebra II); read values of an **inverse** function from a graph or a table, given that the function has an **inverse** (Algebra II).



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- HSF.IF.A.3:
  - Recognize that **sequences** are functions, sometimes defined **recursively**, whose domain is a subset of the integers.

*\*Guaranteed Viable Curriculum.*

Vocabulary to Emphasize is highlighted in **bold** script.

<b>Learning Goal</b>	<b>Notes</b>	<b>Bellwork/Exit</b>	<b>Practice</b>
<p><b>Students will calculate and interpret average rate of change.</b></p>	<p>Students will review the Attributes of Functions Note from Unit 2.</p>	<p>Pre-Assessment CFA 1 Unit 5: Average Rate of Change.</p> <p>CFA 1 Unit 5: Average Rate of Change with Key.</p>	<p>Task: Average Rate of Change Fish Population Graph. Note this task is also in Unit 2.</p> <p>Worksheet for Average Rate of Change with Graphs, Tables, Functions.</p>
<p><b>Students will demonstrate the ability to combine functions using function operations.</b></p> <p><b>Students will demonstrate the ability to compose functions.</b></p>	<p>Function Operations Including Composition Note.</p>	<p>Pre-Assessment CFA 2 Unit 5: Function Operations.</p> <p>CFA 2 Unit 5: Function Operations.</p>	<p>Task Combine Functions using Addition with Key from IM.</p> <p>Worksheet: Operation and Composition of Functions.</p> <p>Matching Activity: Composition of Functions free from TPT.</p> <p>Scavenger Hunt: Composition of Functions from Jill Bell.</p> <p>Task Temperature Conversion using Composition with Key from IM.</p>



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<p><b>Students will demonstrate the ability to find and apply an inverse function.</b></p>	<p>Functions and Their Inverses Note.</p>		<p>Exploration: Inverse Function Activity free from TPT.</p> <p>Coloring Activity: Function Notation and Inverse Functions free from TPT.</p> <p>Worksheet: Finding and Verifying Inverse Functions by Kuta with Key.</p> <p>Task Temperature Conversion using Inverses with Key from IM.</p>
<p><b>Students will demonstrate the ability to rearrange literal equations or formulas for application purposes.</b></p> <p><b>Students will write arithmetic sequences and series, both recursively and with an explicit formula, to model situations.</b></p>	<p>Literal Equations Note.</p> <p>Arithmetic Sequences and Series Note.</p>	<p>Pre-Assessment CFA 3 Unit 5: Literal Equations.</p> <p>CFA 3 Unit 5: Literal Equations with Key.</p>	<p>Worksheet Solving Literal Equations.</p> <p>Game: Solving Literal Equations with Teacher Commentary and Key.</p> <p>Task 1 Solving Literal Equations with Key from IM.</p> <p>Task 2 Solving Literal Equations with Key from IM. Note: One part is exponential and would require a logarithm step.</p> <p>Worksheet #1: Arithmetic Sequences and Series with Key.</p> <p>Worksheet #2: Arithmetic Sequences and Series with Key.</p>



Summative Assessment Functions with Key (Regular Version)

Summative Assessment Functions with Key (PAP Version)