Algebra I - High School Math
Curriculum Resources

Curriculum Overview

The Alabama Course of Study: Mathematics (2019) provides the framework for the K-12 study of Mathematics in Alabama's public schools. Content standards in this document are minimum and required, fundamental and specific, but not exhaustive. The standards set high expectations for student learning in all grades.

Here are definitions to help understand this curriculum guide:

- **Units of Study:** A series of lessons, experiences, and assessments aligned to standards that may last two to six weeks.
- **Priority Standards:** These are the standards students must know and be able to do to be prepared for the next grade level or course.
- **Supporting Standards:** These standards support, connect to, or enhance priority standards.
- **Knowledge:** What students should know related to the standard.
- **Skills:** What students should be able to do related to the standard.
- **Bloom's Taxonomy:** This hierarchy helps describe the complexity and requirements of a standard.
- **Quad:** This framework has four parts that help determine the rigor and relevance of a standard: Acquisition, Application, Assimilation, Adaptation.
- **ACT:** This refers to ACT standards alignment.
- **Key Understandings:** Essential ideas students need to understand about the standard.
- **Key Vocabulary:** Keywords that should be taught to ensure understanding of the standard.
- **Formative Assessment:** Frequent and ongoing checks for understanding teachers can use throughout the unit.
- **Summative Assessment:** How students will be assessed at the end of a unit to demonstrate their level of mastery of the standards.
- **Activities & Resources:** Specific examples, lessons, and/or resources that may be used to support implementation of the standard.
- **RTI:** Response to Intervention - additional supports/resources teachers can use for students who need them.
- **Extensions:** Additional activities and resources to extend the learning experience, especially for accelerated students.

Algebra I - Curriculum At A Glance - Pacing Calendar

Quarter	# Weeks	Unit Name	Priority Standards	Supporting Standards
	1	Launch Week	**Pre-Assessment**	
	2	UNIT 1: Solving Linear Equations	**13**	**4, 8, 11**
	2	UNIT 2: Solving Linear Inequalities	**13**	**11**
	3	UNIT 3: Linear Equations	**12, 13**	**11, 30**
	3	UNIT 4: Linear Functions Part I	**12, 15a, 16, 23**	**4, 14, 15, 15b, 24b 25, 27, 28, 29, 30, 30a**
	2	UNIT 5: Linear Functions Part II	**12**	**22, 22a, 24b, 29**
	2	UNIT 6: Systems of Linear Equations	**10a, 10b, 13**	**10, 14, 18**
	2	UNIT 7: Systems of Linear Inequalities	**13, 20**	**31**
	3	UNIT 8: Probability (See enVision AL-1 and 11 - 5)	**35, 35a, 35b, 35c, 36, 36a, 36b, 37, 38, 39, 40, 41**	**32, 33, 34**
	2	UNIT 9: Piecewise Functions	**12, 13, 15a, 16, 23**	**14, 21, 28, 29, 30, 30b**
	3	UNIT 10: Exponents and Exponential Functions	**1, 2, 4, 6c, 12, 13, 15a, 16**	**15b, 28, 14, 22, 22a, 24, 24a, 24b, 24c, 25, 27, 29, 30, 30c**
	2	UNIT 11: Transformation of Functions (Linear, Absolute Value, Exponential)	**16, 23**	**21, 28, 30, 30b, 30c, 31**
	3	UNIT 12: Polynomials and Factoring	**5, 7**	**4**
	3	UNIT 13: Quadratic Functions	**6, 6b, 12, 13, 15a, 16, 23,**	**14, 15b, 21, 26, 28, 29, 30, 30a, 31**
	3	UNIT 14: Solving Quadratic Equations	**2, 5, 6a, 9a, 9b, 12, 13**	**3, 11, 18, 19, 19a**
	2	UNIT 15: Working with Functions	**20**	**15b, 17, 17a, 17b, 18, 28**

UNIT 1: Solving Linear Equations	DURATION: 2 weeks

CONTENT STANDARDS

PRIORITY STANDARDS

- **13 - Represent constraints by equations and/or inequalities, and solve systems of equations and/or inequalities, interpreting solutions as viable or nonviable options in a modeling context. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.**

SUPPORTING STANDARDS

4 - Interpret linear expressions in terms of a context by viewing one or more of their parts as a single entity
8. Explain why extraneous solutions to an equation involving absolute values may arise and how to check to be sure that a candidate solution satisfies an equation.
11. Create equations and inequalities in one variable and use them to solve problems in context, either exactly or approximately. Extend from contexts arising from linear functions to those involving quadratic, exponential, and absolute value functions.

The knowledge and skills are the elements on which we collect evidence to determine whether a student is proficient or not proficient against the PRIORITY standards.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
	Find the sum or product of two rational numbers	Applying	B - Application	A 403, AF 502
Explain why the sum or product of two rational numbers is rational		Evaluating	A - Acquisition	A 403, AF 502
	Find the sum or product of a rational and an irrational number	Applying	B - Application	A 403, AF 502
Explain when the sum or product of a rational and an irrational number is irrational		Evaluating	A - Acquisition	A 403, AF 502
Explain that each step in solving a linear equation follows from the equality in the previous step		Understanding	A - Acquisition	AF 201, A 403, AF 702
	Create and solve linear equations with one variable using the properties of equality	Creating	D - Adaptation	AF 201, A 403, AF 702

	Use the properties of equality to solve linear equations with a variable on both sides	Applying	B - Application	AF 201, A 403, AF 702
Identify whether linear equations have one solution, infinitely many solutions, or no solution		Remembering	A - Acquisition	AF 201, A 403, AF 702
	Rearrange formulas and equations to highlight a quantity of interest by isolating the variable using the same reasoning used to solve equations.	Analyzing	C - Assimilation	A 601, G 705
	Use formulas and equations to solve problems.	Applying	B - Application	G 705

KEY COMPONENTS	
LEARNING TARGETS (incremental learning target by week) Week 2 ● Day 1 - 1 - 1: Reason about operations on real numbers ● Day 2 - 1 - 2: Create and solve linear equations with one variable ● Day 3 - Review and Quiz Week 3 ● Day 4 - 1 - 3: Write and solve equations with a variable on both sides to solve problems ● Day 5 - 1 - 4: Rewrite and use literal equations to solve problems ● Day 6 - Review and Quiz	KEY VOCABULARY ● Element of a set ● Set ● Subset ● Identity ● Formula ● Literal equation
ESSENTIAL QUESTION(S) ● 1-1: How can you classify the results of operations on real numbers? ● 1-2: How do you create equations and use them to solve problems? ● 1-3: How do you create equations with a variable on both sides and use them to solve problems? ● 1-4: How is rewriting literal equations useful when solving problems?	PRIOR KNOWLEDGE ● Applied properties of operations to find sums and products of rational numbers.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

enVision Algebra I - 1-1 Lesson Quiz	enVision Algebra I - Topic Assessment Form A #1 - 12

ACTIVITIES & RESOURCES	
Proficiency Scale: Standard 13	Real Number System Sort Using a Venn Diagram The Math Frayer Model
RTI	EXTENSION OPPORTUNITIES

UNIT 2: Solving Linear Inequalities	DURATION: 2 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS • **13 - Represent constraints by equations and/or inequalities, and solve systems of equations and/or inequalities, interpreting solutions as viable or nonviable options in a modeling context. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.**	SUPPORTING STANDARDS 11. Create equations and inequalities in one variable and use them to solve problems in context, either exactly or approximately. Extend from contexts arising from linear functions to those involving quadratic, exponential, and absolute value functions.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
	Create problems with inequalities	Creating	D - Adaptation	AF 502, A 503, A 602, AF 702
	Solve problems with inequalities	Applying	B - Application	AF 502, A 503, A 602, AF 702
Interpret solutions to inequalities within the context.		Understanding	A - Acquisition	AF 502, A 602, AF 702
Identify inequalities as true or false based on the number of solutions.		Remembering	A - Acquisition	AF 502, A 602, AF 702

	Create a system of inequalities	Creating	D - Adaptation	AF 502, A 503, A 602, AF 702
	Solve a system of inequalities	Applying	B - Application	AF 502, A 503, A 602, AF 702
Interpret the solution to a compound inequality within a modeling context		Understanding	A - Acquisition	AF 502, A 602, AF 702
	Solve absolute value equations and inequalities	Applying	B - Application	A 606, A 701
	Use absolute value equations and inequalities to solve problems.	Applying	B - Application	A 606, A 701

KEY COMPONENTS	
LEARNING TARGETS (incremental learning target by week) Week 4 ● Day 1 - 1 - 5: Solve and graph inequalities ● Day 2 - 1 - 6: Write and solve compound inequalities ● Day 3 - Review and Quiz Week 5 ● Day 4 - 1 - 7: Write and solve absolute value equations and inequalities ● Day 5 - Review ● Day 6 - Test	KEY VOCABULARY ● Compound inequality
ESSENTIAL QUESTION(S) ● 1 - 5: How are the solutions of an inequality different from the solutions of an equation? ● 1 - 6: What are compound inequalities and how are their solutions represented? ● 1 - 7: Why does the solution for an absolute value equation or inequality typically result in a pair of equations or inequalities?	PRIOR KNOWLEDGE ● Use the properties of equality to solve equations in one variable ● Use the properties of inequalities to solve inequalities with one variable. ● Interpret the solutions of inequalities within the context of real - world problems. ● Write and solve equations and inequalities in one variable. ● Write and solve compound inequalities and interpret the solution in context.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

enVision Algebra I - 1-6: Lesson Quiz	enVision Algebra I - Topic Assessment Form A #13 - 20

ACTIVITIES & RESOURCES	
Proficiency Scale: Standard 13	Day 1 - enVision Algebra I - 1-5: Mathematical Literacy and Vocabulary Day 2 - enVision Algebra I - 1-6: Mathematical Literacy and Vocabulary
RTI	EXTENSION OPPORTUNITIES

UNIT 3: Linear Equations	DURATION: 3 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS ● **12 - Create equations in two or more variables to represent relationships between quantities in context; graph equations on coordinate axes with labels and scales and use them to make predictions. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.** ● **13 - Represent constraints by equations and/or inequalities, and solve systems of equations and/or inequalities, interpreting solutions as viable or nonviable options in a modeling context. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.**	**SUPPORTING STANDARDS** 11. Create equations and inequalities in one variable and use them to solve problems in context, either exactly or approximately. Extend from contexts arising from linear functions to those involving quadratic, exponential, and absolute value functions. 30. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ○ a. Graph linear and quadratic functions and show intercepts, maxima, and minima.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
	Write linear equations in two variables using slope - intercept form to represent the relationship between two quantities	**Creating**	**C - Assimilation**	**AF 402**
Interpret the slope and the intercept of a linear model.		**Applying**	**B - Application**	**AF 503**
	Write and graph linear equations in point - slope form	**Creating**	**C - Assimilation**	**AF 503**
	Analyze different forms of a line to interpret the slope and y - intercept of a linear model in the context of data.	**Analyzing**	**C - Assimilation**	**AF 503**
	Write and graph linear equations in standard form.	**Creating**	**C - Assimilation**	**AF 402**
	Use linear equations in standard form to interpret both the x- and y- intercepts in the context of given data.	**Applying**	**B - Application**	**AF 503**

	Create equations to represent lines that are parallel or perpendicular to a given line.	Creating	D - Adaptation	G 606
	Graph lines to show an understanding of the relationship between the slopes of parallel and perpendicular lines.	Analyzing	C - Assimilation	G 606

KEY COMPONENTS	
LEARNING TARGETS (incremental learning target by week) Week 6 • Day 1 - 2 - 1: Write and graph linear equations using slope - intercept form • Day 2 - 2 - 2: Write and graph linear equations in point - slope form • Day 3 - Review and Quiz Week 7 • Day 4 - 2 - 3: Write and graph linear equations in standard form • Day 5 - 2 - 4: Write equations of parallel and perpendicular lines. • Day 6 - Review and Quiz Week 8 • Day 7 - Review • Day 8 - Test	KEY VOCABULARY • Slope - intercept form • Y - intercept • Point - slope form • Standard form of a linear equation • Parallel lines • Perpendicular lines • Reciprocal
ESSENTIAL QUESTION(S) • 2 - 1: What information does the slope - intercept form of a linear equation reveal about a line? • 2 - 2: What information does the point - slope form of a linear equation reveal about a line? • 2 - 3: What information does the standard form of a linear equation reveal about a line? • 2 - 4: How can the equations of lines help you identify whether the lines are parallel, perpendicular, or neither?	PRIOR KNOWLEDGE • Use linear equations to represent relationships involving constant rates of change.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT
Day 7 - Writing Equations of Lines Kahoot! enVision Algebra I - 2-1: Lesson Quiz enVision Algebra I - 2-2: Lesson Quiz	enVision Algebra I Topic Assessment Form A #1 - 20

enVision Algebra I - 2-3: Lesson Quiz **enVision Algebra I - 2-4: Lesson Quiz**	

ACTIVITIES & RESOURCES	
Proficiency Scale: Standard 12 **Proficiency Scale: Standard 13**	**Day 1 - Desmos: Graphing and Writing Slope-Intercept Form** **Day 2 - Desmos: Point-Slope Form or** Point-Slope Form Option 2 Day 5 - enVision Algebra I - 2 - 4: Reteach to Build Understanding Day 5 - enVision Algebra I - 2 - 4: Mathematical Literacy and Vocabulary
RTI	**EXTENSION OPPORTUNITIES**

UNIT 4: Linear Functions Part I	DURATION: 3 weeks

CONTENT STANDARDS

PRIORITY STANDARDS

- **12. Create equations in two or more variables to represent relationships between quantities in context; graph equations on coordinate axes with labels and scales and use them to make predictions. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.**
- **15a. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. Note: If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x.**
- **16. Compare and contrast relations and functions represented by equations, graphs, or tables that show related values; determine whether a relation is a function. Explain that a function f is a special kind of relation defined by the equation y = f(x).**
- **23. Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k \cdot f(x)$, $f(k \cdot x)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and explain the effects on the graph, using technology as appropriate. Limit to linear, quadratic, exponential, absolute value, and linear piecewise functions.**

SUPPORTING STANDARDS

4. Interpret linear, quadratic, and exponential expressions in terms of a context by viewing one or more of their parts as a single entity. Example: Interpret the accrued amount of investment $P(1 + r)^t$, where P is the principal and r is the interest rate, as the product of P and a factor depending on time t.

14. Given a relation defined by an equation in two variables, identify the graph of the relation as the set of all its solutions plotted in the coordinate plane. Note: The graph of a relation often forms a curve (which could be a line).

15. Define a function as a mapping from one set (called the domain) to another set (called the range) that assigns to each element of the domain exactly one element of the range.
    - b. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. Limit to linear, quadratic, exponential, and absolute value functions.

24b. Define linear functions to represent situations in which one quantity changes at a constant rate per unit interval relative to another.

25. 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).

27. Interpret the parameters of functions in terms of a context. Extend from linear functions, written in the form mx + b, to exponential functions, written in the form abx. Example: If the function $V(t) = 19885(0.75)^t$ describes the value of a car after it has been owned for t years, 19885 represents the purchase price of the car when t = 0, and 0.75 represents the annual rate at which its value decreases.

28. 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. Note: Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; symmetries; and end behavior. Extend from relationships that can be represented by linear functions to quadratic, exponential, absolute value, and linear piecewise functions.

29. Calculate and interpret the average rate of change of a function

	(presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. Limit to linear, quadratic, exponential, and absolute value functions. 30 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ○ a. Graph linear and quadratic functions and show intercepts, maxima, and minima

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
Understand that a relation is a function if each element of the domain is assigned to exactly one element in the range.		**Remembering**	**A - Acquisition**	**F 505**
	Determine a reasonable domain and identify constraints on the domain based on the context of a real-world problem.	**Evaluating**	**D - Adaptation**	**F 506**
	Write and evaluate linear functions using function notation.	**Applying**	**B - Application**	**A 401, F 401, F 511**
	Graph a linear function and relate the domain of a function to its graph.	**Applying**	**B - Application**	**F 506**
Interpret functions represented by graphs, tables, verbal descriptions, and function notation in terms of a context.		**Analyzing**	**C - Assimilation**	**F 506, F 511**

KEY COMPONENTS	
LEARNING TARGETS (incremental learning target by week) **Week 9** ● **Day 1 - 3 - 1: Determine whether a relation is a function** ● **Day 2 - 3 - 2: Identify, evaluate, graph, and write linear equations** ● **Day 3 - Review and Quiz** **Week 10** ● **Day 4 - Review** ● **Day 5 - Test**	**KEY VOCABULARY** ● **Continuous** ● **Discrete** ● **Domain** ● **Range** ● **Function** ● **One - to - one** ● **Relation** ● **Function notation**

	• Linear function
ESSENTIAL QUESTION(S) • 3 - 1: What is a function? Why is domain and range important in defining a function? • 3 - 2: How can you identify a linear function?	PRIOR KNOWLEDGE • Know key features of linear functions including slope and rate of change • Solve linear equations with variables on both sides • Write a linear equation in the form y = mx + b • Graph coordinate pairs.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT
enVision Algebra I - 3-1 Lesson Quiz	

ACTIVITIES & RESOURCES	
Proficiency Scale: Standard 12 Proficiency Scale: 15a Proficiency Scale: Standard 23	• Day 1 Illustrative Mathematics Task - Finding the Domain (Each input has one output; Students will also explore a rational function in which an input has an undefined output) • Day 1 - enVision Algebra I 3-1 Mathematical Literacy and Vocabulary • Day 1 - Horizontal Line Test and One-to-One Functions Video (4:17) • Day 2 Illustrative Mathematics Task - Points on a Graph (Evaluate functions using function notation) • Day 2 - enVision Algebra I 3-2 Mathematical Literacy and Vocabulary
RTI	EXTENSION OPPORTUNITIES

UNIT 5: Linear Functions Part II	DURATION: 2 weeks

CONTENT STANDARDS

PRIORITY STANDARDS

- **12. Create equations in two or more variables to represent relationships between quantities in context; graph equations on coordinate axes with labels and scales and use them to make predictions. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.**

SUPPORTING STANDARDS

22. Define sequences as functions, including recursive definitions, whose domain is a subset of the integers.
    - a. Write explicit and recursive formulas for arithmetic and geometric sequences and connect them to linear and exponential functions. Example: A sequence with constant growth will be a linear function, while a sequence with proportional growth will be an exponential function.

24b. Define linear functions to represent situations in which one quantity changes at a constant rate per unit interval relative to another.
29. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. Limit to linear, quadratic, exponential, and absolute value functions.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
	Write arithmetic and geometric sequences both recursively and with an explicit formula.	**Applying**	**B - Application**	**F 502**
	Use explicit formulas and recursive formulas to model real - world situations.	**Applying**	**D - Adaptation**	**F 402, F 503, F702, A 406**
	Translate between explicit and recursive formulas.	**Applying**	**B - Application**	**F 603**
	Fit a function to linear data shown in a scatter plot and use fitted functions to solve problems in the context of data	**Creating**	**D - Adaptation**	**F 503, F 601, F 701**
Interpret the slope of a trend line within the context of data.		**Evaluating**	**C - Assimilation**	**A 514, F 503**

	Compute and interpret the correlation coefficient for linear data.	**Applying**	**B - Application**	**F 701**
	Plot and analyze residuals to assess the fit of a function.	**Applying**	**C - Assimilation**	**F 701**
Distinguish between correlation and causation		**Analyzing**	**C - Assimilation**	**F 701**

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

Week 11

- **Day 1 - 3 - 4: Identify and describe arithmetic sequences**
- **Day 2 - 3 - 5: Use a scatter plot to describe the relationship between two data sets.**
- **Day 3 - Review and Quiz**

Week 12

- **Day 4 - 3 - 6: Find the line of best fit for a data set and evaluate its goodness of fit.**
- **Day 5 - Review**
- **Day 6 - Test**

KEY VOCABULARY

- **Arithmetic sequence**
- **Common difference**
- **Explicit formula**
- **Recursive formula**
- **Sequence**
- **Term of a sequence**
- **Negative association**
- **Negative correlation**
- **No association**
- **Positive association**
- **Positive correlation**
- **Trend line**
- **Causation**
- **Correlation**
- **Coefficient**
- **Extrapolation**
- **Interpolation**
- **Line of best fit**
- **Linear regression**
- **Residual**

ESSENTIAL QUESTION(S)

- **3 - 4: How are arithmetic sequences related to linear functions?**
- **3 - 5: How can you use a scatter plot to describe the relationship between two data sets?**
- **3 - 6: How can you evaluate the goodness of fit of a line of best fit for a paired data set?**

PRIOR KNOWLEDGE

- **Know key features of linear functions including slope and rate of change**
- **Solve linear equations with variables on both sides**
- **Write a linear equation in slope - intercept form**
- **Graph coordinate pairs**

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT
	enVision Algebra I - Topic Assessment Form A #10 - 20

ACTIVITIES & RESOURCES

Proficiency Scale: Standard 12	Day 1 - Arithmetic/Geometric Sequences - Graphic Organizer Day 2 - Illustrative Mathematics Task - 8.F US Garbage, Version 1 Day 4 - Desmos: Line of Best Fit Day 4 - enVision Algebra I - 3 - 6: Mathematical Literacy and Vocabulary
RTI	EXTENSION OPPORTUNITIES

UNIT 6: Systems of Linear Equations	DURATION: 2 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS • **10a. Solve a system of two equations in two variables by using linear combinations; contrast situations in which use of linear combinations is more efficient with those in which substitution is more efficient.** • **10b. Contrast solutions to a system of two linear equations in two variables produced by algebraic methods with graphical and tabular methods.** • **13. Represent constraints by equations and/or inequalities, and solve systems of equations and/or inequalities, interpreting solutions as viable or nonviable options in a modeling context. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.**	**SUPPORTING STANDARDS** 10. Select an appropriate method to solve a system of two linear equations in two variables. 14. Given a relation defined by an equation in two variables, identify the graph of the relation as the set of all its solutions plotted in the coordinate plane. Note: The graph of a relation often forms a curve (which could be a line). 18. Solve systems consisting of linear and/or quadratic equations in two variables graphically, using technology where appropriate.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
Understand that the solution of a system of linear equations may be one solution, infinitely many solutions, or no solution		**Understanding**	**B - Application**	**A 604**
	Graph systems of linear equations in two variables to find an approximate solution.	**Applying**	**B - Application**	**A 604, F 602**
	Write a system of linear equations in two variables to represent real-world problems.	**Applying**	**C - Assimilation**	**A 604, F 602**
	Use the substitution method to solve systems of equations.	**Applying**	**B - Application**	**A 604**
Represent situations as systems of equations and interpret solutions as viable/nonviable options for the situation.		**Applying**	**C - Assimilation**	**A 604, F 602**

	Solve systems of linear equations by elimination and prove that the sum of one equation and a multiple of the other produces a system with the same solutions as the original system.	**Applying**	**B - Application**	**A 604, F 602**
Represent constraints with a system of equations in a modeling context.		**Creating**	**C - Assimilation**	**A 503**

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

Week 13

- **Day 1 - 4 - 1: Use graphs to find approximate solutions to systems of equations**
- **Day 2 - 4 - 2: Solve a system of equations using the substitution method**
- **Day 3 - Review and Quiz**

Week 14

- **Day 4 - 4 - 3: Solve systems of linear equations using the elimination method**
- **Day 5 - Review**
- **Day 6 - Test**

KEY VOCABULARY

- **Substitution**
- **Elimination**

ESSENTIAL QUESTION(S)

- **4 - 1: How can you use a graph to illustrate the solution to a system of linear equations?**
- **4 - 2: How do you use substitution to solve a system of linear equations?**
- **4 - 3: Why does the elimination method work when solving a system of equations?**

PRIOR KNOWLEDGE

- **Solve linear equations with variables on both sides**
- **Represent the solutions to linear inequalities in one variable graphically.**
- **Graph linear functions written in slope - intercept form by plotting the y - intercept, using the slope to plot a second point, and connecting the points with a line.**
- **Translate linear equations into standard form**

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES

Proficiency Scale: Standard 13	
RTI	**EXTENSION OPPORTUNITIES**

UNIT 7: Systems of Linear Inequalities	DURATION: 2 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS • **13. Represent constraints by equations and/or inequalities, and solve systems of equations and/or inequalities, interpreting solutions as viable or nonviable options in a modeling context. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.** • **20. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes, using technology where appropriate.**	**SUPPORTING STANDARDS** 31. Use the mathematical modeling cycle to solve real-world problems involving linear, quadratic, exponential, absolute value, and linear piecewise functions.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
Recognize the solutions of the inequality as the half-plane above or below the boundary line.		**Applying**	**B - Application**	**A 503**
Understand viable and nonviable options in a modeling context		**Understanding**	**C - Assimilation**	**A 503**
	Graph solutions to linear inequalities in two variables	**Applying**	**B - Application**	**A 503**
	Represent constraints with inequalities and interpret solutions as viable or nonviable options in a modeling context.	**Applying**	**C - Assimilation**	**A 503**
	Graph the solution set of a system of linear inequalities in two variables.	**Applying**	**B - Application**	**A 503, F 505, F 506**
Interpret solutions of linear inequalities in a modeling context.		**Applying**	**B - Application**	**A 503, F 505, F 506**

KEY COMPONENTS	
LEARNING TARGETS (incremental learning target by week) **Week 15** ● **Day 1 - 4 - 4: Graph solutions to linear inequalities in two variables** ● **Day 2 - 4 - 5: Graph and solve a system of linear inequalities** ● **Day 3 - Review and Quiz** **Week 16** ● **Day 4 - Review** ● **Day 5 - Test**	**KEY VOCABULARY** ● **Linear inequality in two variables** ● **Solution of a linear inequality in two variables** ● **System of linear inequalities** ● **Solutions of a system of linear inequalities**
ESSENTIAL QUESTION(S) ● **4 - 4: How does the graph of a linear inequality in two variables help you identify the solutions of the inequality?** ● **4 - 5: How is the graph of a system of linear inequalities related to the solutions of the system of inequalities?**	**PRIOR KNOWLEDGE** ● **Represent the solutions to linear inequalities in one variable graphically**

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES	
Proficiency Scale: Standard 13 Proficiency Scale: Standard 20	
RTI	**EXTENSION OPPORTUNITIES**

UNIT 8: Probability (see enVision AL-1 and 11 - 5)	DURATION: 3 weeks

CONTENT STANDARDS

PRIORITY STANDARDS

- **35. Analyze the possible association between two categorical variables.**
  - **a. Summarize categorical data for two categories in two-way frequency tables and represent using segmented bar graphs.**
  - **b. Interpret relative frequencies in the context of categorical data (including joint, marginal, and conditional relative frequencies).**
  - **c. Identify possible associations and trends in categorical data**
- **36. Generate a two-way categorical table in order to find and evaluate solutions to real-world problems.**
  - **a. Aggregate data from several groups to find an overall association between two categorical variables.**
  - **b. Recognize and explore situations where the association between two categorical variables is reversed when a third variable is considered (Simpson's Paradox). Example: In a certain city, Hospital 1 has a higher fatality rate than Hospital 2. But when considering mildly-injured patients and severely-injured patients as separate groups, Hospital 1 has a lower fatality rate among both groups than Hospital 2, since Hospital 1 is a Level 1 Trauma Center. Thus, Hospital 1 receives most of the severely injured patients who are less likely to survive overall but have a better chance of surviving in Hospital 1 than they would in Hospital 2.**
- **37. Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").**
- **38. Explain whether two events, A and B, are independent, using two-way tables or tree diagrams.**
- **39. Compute the conditional probability of event A given event B, using two-way tables or tree diagrams.**
- **40. Recognize and describe the concepts of conditional probability and independence in everyday situations and explain**

SUPPORTING STANDARDS

32. Use mathematical and statistical reasoning with bivariate categorical data in order to draw conclusions and assess risk. Example: In a clinical trial comparing the effectiveness of flu shots A and B, 21 subjects in treatment group A avoided getting the flu while 29 contracted it. In group B, 12 avoided the flu while 13 contracted it. Discuss which flu shot appears to be more effective in reducing the chances of contracting the flu. Possible answer: Even though more people in group A avoided the flu than in group B, the proportion of people avoiding the flu in group B is greater than the proportion in group A, which suggests that treatment B may be more effective in lowering the risk of getting the flu.

	Contracted Flu	Did Not Contract Flu
Flu Shot A	29	21
Flu Shot B	13	12
Total	42	33

33. Design and carry out an investigation to determine whether there appears to be an association between two categorical variables, and write a persuasive argument based on the results of the investigation. Example: Investigate whether there appears to be an association between successfully completing a task in a given length of time and listening to music while attempting the task. Randomly assign some students to listen to music while attempting to complete the task and others to complete the task without listening to music. Discuss whether students should listen to music while studying, based on that analysis.

34. Distinguish between quantitative and categorical data and between the techniques that may be used for analyzing data of these two types. Example: The color of cars is categorical and so is summarized by frequency and proportion for each color category, while the mileage on each car's odometer is quantitative and can be summarized by the mean

them using everyday language. Example: Contrast the chance of having lung cancer if you are a smoker with the chance of being a smoker if you have lung cancer. • **41. Explain why the conditional probability of A given B is the fraction of B's outcomes that also belong to A, and interpret the answer in context. Example: the probability of drawing a king from a deck of cards, given that it is a face card, is $\frac{4/52}{12/52}$, which is $\frac{1}{3}$.**	

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
Distinguish between quantitative and categorical data and between the techniques that may be used for analyzing data of these two types.		**Analyzing**	**C - Assimilation**	**S 602, S 702**
	Organize and summarize categorical data by creating two-way frequency tables.	**Applying**	**C - Assimilation**	**S 602, S 702**
	Calculate and interpret joint and marginal frequencies, joint and marginal relative frequencies and conditional relative frequencies, and use them to make inferences about a population.	**Applying**	**C - Assimilation**	**S 602, S 702**
Explain independence of events in everyday language and everyday situations.		**Understanding**	**B - Understand**	**S 603, S 704**
	Determine the probability of the union of two events (A or B) and the intersection of two independent events (A and B).	**Applying**	**B - Application**	**S 305**
Understand the conditional probability of A given B as the fraction of outcomes in B that also belong to A.		**Understanding**	**B - Application**	**S 603, S 704**
Interpret independence of events in terms of conditional probability.		**Applying**	**B - Application**	**S 603, S 704**
	Use a two-way frequency table to decide if events are independent and to approximate	**Applying**	**B - Application**	**S 603, S 704**

	conditional probabilities.			

KEY COMPONENTS	
LEARNING TARGETS (incremental learning target by week) **Week 17** ● **Day 1 - AL-1-1: Distinguish between quantitative and categorical variables and identify the techniques used to analyze data of either type.** ● **Day 2 - AL-1-2: Organize data in two-way frequency tables and use them to make inferences.** ● **Day 3 - Review and Quiz** **Week 18** ● **Day 4 - AL-1-3: Model situations using two - way tables and find relationships between categorical variables.** ● **Day 5 - AL-1-4: Use relationships among events to find probabilities.** ● **Day 6 - Review and Quiz** **Week 19** ● **Day 7 - AL-1-5: Find the probability of an event that another event occurred.** ● **Day 8 - Review** ● **Day 9 - Test**	**KEY VOCABULARY** ● **Conditional relative frequency** ● **Joint frequency** ● **Joint relative frequency** ● **Marginal frequency** ● **Marginal relative frequency** ● **Complement** ● **Independent events** ● **Mutually exclusive** ● **Conditional probability** ● **Dependent events**
ESSENTIAL QUESTION(S) ● **AL-1-2: How can you use two - way frequency tables to analyze data?** ● **AL-1-4: How does describing events as mutually exclusive or independent affect how you find probabilities?** ● **AL-1-5: How are conditional probability and independence related in real-world experiments?**	**PRIOR KNOWLEDGE** ●

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES

Proficiency Scale: Standard 35 Proficiency Scale: Standard 36 Proficiency Scale: Standard 38 Proficiency Scale: Standard 40	
RTI	**EXTENSION OPPORTUNITIES**

UNIT 9: Piecewise Functions	**DURATION: 2 weeks**
CONTENT STANDARDS	
PRIORITY STANDARDS • **12. Create equations in two or more variables to represent relationships between quantities in context; graph equations on coordinate axes with labels and scales and use them to make predictions. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.** • **13. Represent constraints by equations and/or inequalities, and solve systems of equations and/or inequalities, interpreting solutions as viable or nonviable options in a modeling context. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions** • **15a. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. Note: If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x.** • **16. Compare and contrast relations and functions represented by equations, graphs, or tables that show related values; determine whether a relation is a function. Explain that a function f is a special kind of relation defined by the equation y = f(x)** • **23. Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k \cdot f(x)$, $f(k \cdot x)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and explain the effects on the graph, using technology as appropriate. Limit to linear, quadratic, exponential, absolute value, and linear piecewise functions.**	**SUPPORTING STANDARDS** 14. Given a relation defined by an equation in two variables, identify the graph of the relation as the set of all its solutions plotted in the coordinate plane. Note: The graph of a relation often forms a curve (which could be a line). 21. Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). Extend from linear to quadratic, exponential, absolute value, and general piecewise. 28. 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. Note: Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; symmetries; and end behavior. Extend from relationships that can be represented by linear functions to quadratic, exponential, absolute value, and linear piecewise functions. 29. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. Limit to linear, quadratic, exponential, and absolute value functions. 30. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ○ b. Graph piecewise-defined functions, including step functions and absolute value functions.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
Identify key features of an absolute value graph		**Remembering**	**A - Acquisition**	**F 705**
	Graph an absolute value function	**Applying**	**B - Application**	**F 511**
	Calculate and interpret the rate of change of an absolute value function over a specified interval.	**Applying**	**B - Application**	**A 406**
Identify key features of piecewise - defined functions		**Remembering**	**A - Acquisition**	**F 705**
	Graph piecewise - defined functions	**Applying**	**B - Application**	**F 511, F 401**
	Analyze the key features of the graph of a piecewise	**Analyzing**	**C - Assimilation**	**F 401, F 505, A 401, F 705**
Interpret a piecewise - defined function		**Applying**	**C - Assimilation**	**F 402, F 401**
	Write a piecewise - defined function to solve application problems.		**C - Assimilation**	**A 401**
	Graph step functions including ceiling and floor functions	**Applying**	**B - Application**	**A 401, F 511**
Interpret the average rate of change of step functions		**Applying**	**B - Application**	**A 406**
	Calculate the average rate of change of step functions	**Applying**	**B - Application**	**A 406**

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)
Week 20

- **Day 1 - 5 - 1: Analyze functions that include absolute value expressions**

KEY VOCABULARY

- **Absolute value function**
- **Axis of symmetry**
- **Vertex**

• Day 2 - 5 - 2: Graph and apply piecewise - defined functions. • Day 3 - Review and Quiz Week 21 • Day 4 - 5 - 3: Graph and apply step functions • Day 5 - Review • Day 6 - Test	• Piecewise - defined function • Ceiling function • Floor function • Step function
ESSENTIAL QUESTION(S) • 5 - 1: What are the key features of the graph of the absolute value function? • 5 - 2: What are the key features of piecewise - defined functions? • 5 - 3: How are step functions related to piecewise defined functions?	PRIOR KNOWLEDGE • Definition of a function • Write linear functions in slope - intercept form

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES	
Proficiency Scale: Standard 12 Proficiency Scale: Standard 13 Proficiency Scale:15a Proficiency Scale: Standard 21	
RTI	EXTENSION OPPORTUNITIES

UNIT 10: Exponents and Exponential Functions	DURATION: 3 weeks

CONTENT STANDARDS

PRIORITY STANDARDS

- **1. Explain how the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for an additional notation for radicals using rational exponents.**
- **2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.**
- **6c. Use the properties of exponents to transform expressions for exponential functions. Example: Identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, and classify them as representing exponential growth or decay.**
- **12. Create equations in two or more variables to represent relationships between quantities in context; graph equations on coordinate axes with labels and scales and use them to make predictions. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.**
- **13. Represent constraints by equations and/or inequalities, and solve systems of equations and/or inequalities, interpreting solutions as viable or nonviable options in a modeling context. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.**
- **15a. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context. Note: If f is a function and x is an element of its domain, then f(x) denotes the output of f corresponding to the input x.**
- **16. Compare and contrast relations and functions represented by equations, graphs, or tables that show related values; determine whether a relation is a function. Explain that a function f is a special kind of relation defined by the equation y = f(x).**

SUPPORTING STANDARDS

4. Interpret linear, quadratic, and exponential expressions in terms of a context by viewing one or more of their parts as a single entity. Example: Interpret the accrued amount of investment $P(1 + r)^t$, where P is the principal and r is the interest rate, as the product of P and a factor depending on time t

15b. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. Limit to linear, quadratic, exponential, and absolute value functions.

28. 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. Note: Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; symmetries; and end behavior. Extend from relationships that can be represented by linear functions to quadratic, exponential, absolute value, and linear piecewise functions.

14. Given a relation defined by an equation in two variables, identify the graph of the relation as the set of all its solutions plotted in the coordinate plane. Note: The graph of a relation often forms a curve (which could be a line).

22. Define sequences as functions, including recursive definitions, whose domain is a subset of the integers.

- a. Write explicit and recursive formulas for arithmetic and geometric sequences and connect them to linear and exponential functions. Example: A sequence with constant growth will be a linear function, while a sequence with proportional growth will be an exponential function.

24. Distinguish between situations that can be modeled with linear functions and those that can be modeled with exponential functions.

- a. Show that linear functions grow by equal differences over equal intervals, while exponential functions grow by equal factors over equal intervals.
- b. Define linear functions to represent situations in which one quantity changes at a constant rate per unit interval relative to another.
- c. Define exponential functions to represent situations in

	which a quantity grows or decays by a constant percent rate per unit interval relative to another. 25. 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). 27. Interpret the parameters of functions in terms of a context. Extend from linear functions, written in the form mx + b, to exponential functions, written in the form abx. Example: If the function $V(t) = 19885(0.75)^t$ describes the value of a car after it has been owned for t years, 19885 represents the purchase price of the car when t = 0, and 0.75 represents the annual rate at which its value decreases. 29. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. Limit to linear, quadratic, exponential, and absolute value functions. 30. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ○ c. Graph exponential functions, showing intercepts and end behavior.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
Extend the properties or integer and rational exponents		**Applying**	**B - Application**	**N 605, N 702**
	Rewrite radical expressions using rational exponents	**Remembering**	**A - Acquisition**	**A 509, A 510**
	Solve equations with rational exponents using the properties of exponents	**Applying**	**B - Application**	**N 605, N 702**
	Sketch graphs showing key features of exponential functions	**Applying**	**B - Application**	**F 702**
	Write exponential functions using tables and graphs.	**Creating**	**C - Assimilation**	**F 702**
Compare linear and exponential functions		**Analyzing**	**B - Application**	**A 601, A 401, F 506**

	Construct exponential growth and decay functions given a description of a relationship	**Creating**	**C - Assimilation**	**F 702, F 507**
Recognize if a situation can be modeled with exponential growth or exponential decay, and interpret the parameters of the model in context.		**Understanding**	**B - Application**	**F 507**
	Find explicit and recursive formulas for geometric sequences	**Applying**	**B - Application**	**F 502, F 301, F 703**
	Translate between recursive and explicit formulas for geometric sequences	**Applying**	**B - Application**	**F 502, F 301, F 703**
	Construct exponential functions to represent geometric sequences.	**Creating**	**C - Assimilation**	**F 502, F 301, F 703**

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

Week 22

- **Day 1 - 6 - 1: Use properties of exponents to solve equations with rational exponents**
- **Day 2 - 6 - 2: Describe and graph exponential functions**
- **Day 3 - Review and Quiz**

Week 23

- **Day 4 - 6 - 3: Use exponential functions to model situations and make predictions.**
- **Day 5 - 6 - 4: Identify and describe geometric sequences**
- **Day 6 - Review and Quiz**

Week 24

- **Day 7 - Review**
- **Day 8 - Test**

KEY VOCABULARY

- **Rational exponent**
- **Asymptote**
- **Constant ratio**
- **Exponential function**
- **Compound interest**
- **Decay factor**
- **Exponential decay**
- **Exponential growth**
- **Growth factor**
- **Geometric sequence**

ESSENTIAL QUESTION(S)

- **6 - 1: What are the properties of rational exponents and how are they used to solve problems?**
- **6 - 2: What are the characteristics of exponential functions?**
- **6 - 3: What kinds of situations can be modeled with exponential growth or exponential decay functions?**
- **6 - 4: How are geometric sequences related to exponential**

PRIOR KNOWLEDGE

- **Create and solve linear equations**
- **Graph coordinate pairs and linear equations in different forms**
- **Identify functions**
- **Write functions using function notation**

functions?	

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES	
Proficiency Scale: Standard 2 Proficiency Scale: 6c Proficiency Scale: Standard 12 Proficiency Scale: Standard 13 Proficiency Scale: 15a	Day 5 - Arithmetic/Geometric Sequences - Graphic Organizer
RTI	**EXTENSION OPPORTUNITIES**

UNIT 11: Transformation of Functions	DURATION: 2 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS ● **16. Compare and contrast relations and functions represented by equations, graphs, or tables that show related values; determine whether a relation is a function. Explain that a function f is a special kind of relation defined by the equation y = f(x).** ● **23. . Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k \cdot f(x)$, $f(k \cdot x)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and explain the effects on the graph, using technology as appropriate. Limit to linear, quadratic, exponential, absolute value, and linear piecewise functions.**	**SUPPORTING STANDARDS** 21. Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). Extend from linear to quadratic, exponential, absolute value, and general piecewise. 28. 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. Note: Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; symmetries; and end behavior. Extend from relationships that can be represented by linear functions to quadratic, exponential, absolute value, and linear piecewise functions. 30. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ○ b. Graph piecewise-defined functions, including step functions and absolute value functions. ○ c. Graph exponential functions, showing intercepts and end behavior. 30b, 30c, 31. Use the mathematical modeling cycle to solve real-world problems involving linear, quadratic, exponential, absolute value, and linear piecewise functions.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
	Graph transformations of linear functions by identifying the effect of multiplying or adding specific values of k to the input or output of a function	**Applying**	**B - Application**	**F 604, F 706**
Interpret the key features of the graph of a linear function		**Applying**	**B - Application**	**F 603**

	Use key features of linear function to write the function that the graph represents.	**Creating**	**C - Assimilation**	**F 706**
	Graph transformations of piecewise - defined functions	**Applying**	**B - Application**	**F 604**
Identify the effect of changing constants and coefficients of absolute value functions on their graphs.		**Remembering**	**A - Acquisition**	**F 603, F 706, F 705**
	Translate the graph of an exponential function vertically and horizontally	**Application**	**A-Acquisition**	**F 703, F 604, F 706**
Identify the effect different values of h and k have on the graph of the function		**Remembering**	**A - Acquisition**	**F 703, F 604, F 705, F 603**
Compare characteristics of two exponential functions represented in different ways, such as tables and graphs.		**Comprehension**	**A-Acquisition**	**F 703, F 303 F 705, F 603**

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

Week 25

- **Day 1 - 3 - 3: Transform linear functions**
- **Day 2 - 5 - 4: Graph and analyze transformations of the piecewise - defined functions**
- **Day 3 - Review and Quiz**

Week 26

- **Day 4 - 6 - 5: Perform, analyze, and use transformations of exponential functions.**
- **Day 5 - Review**
- **Day 6 - Test**

KEY VOCABULARY

- **Transformation**
- **Vertical Translation**
- **Horizontal Translation**
- **Vertical Stretch**
- **Vertical Compression**
- **Horizontal Stretch**
- **Horizontal Compression**

ESSENTIAL QUESTION(S)

- **3 - 3: How does multiplying the input or the output of a linear function rule transform its graph?**
- **5 - 4: How do the constraints affect the graphs of piecewise - defined functions?**
- **6 - 5: How do changes in an exponential function relate to translations of its graph?**

PRIOR KNOWLEDGE

- **Use function notation to represent linear functions**

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT
enVision Algebra I - 3 - 3 Lesson Quiz	

ACTIVITIES & RESOURCES	
Proficiency Scale: Standard 21 Proficiency Scale: Standard 23	Desmos - Linear Functions Transformations Translations of Linear Functions Desmos - Absolute Value Graphs
RTI	EXTENSION OPPORTUNITIES

UNIT 12: Polynomials and Factoring	DURATION: 2 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS • **5. Use the structure of an expression to identify ways to rewrite it.** • **7. Add, subtract, and multiply polynomials, showing that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication**	**SUPPORTING STANDARDS** • **4. Interpret linear, quadratic, and exponential expressions in terms of a context by viewing one or more of their parts as a single entity.**

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
Identify the parts of a polynomial.		**Knowledge**	**A - Acquisition**	**N702, A 505**
Classify polynomials by number of terms and by degree.		**Comprehension**	**B - Application**	**N 702, A 402**
	Write a polynomial in standard form.	**Knowledge**	**B - Application**	**N 702, A 402**
	Add or subtract two polynomials and recognize that polynomials are closed under addition and subtraction.	**Application**	**B - Application**	**A 402, A 505**
	Determine the square of a binomial.	**Application**	**B-Application**	**A 404, A 505, A 509**
	Find the product of a sum and difference of two squares.	**Knowledge**	**B-Acquisition**	**A 404, A 505, A 509**
	Find the greatest common factor of the terms of a polynomial.	**Knowledge**	**B-Acquisition**	**N 301, N 401, N 503, N 601**
	Use the structure of a polynomial, and the understanding that polynomials form a system similar to integers, to rewrite it in	**Application**	**B-Application**	**N 301, N 401, N 503, N 601**

	factored form.			
	Factor a trinomial in the form $x^2 + bx + c$ by finding two binomial factors whose product is equal to the trinomial.	**Application**	**B-Application**	**N 301, N 401, N 503, N 601, A 508**
Identify and use patterns in the signs of the coefficients of the terms of a trinomial expression.		**Knowledge**	**B-Application**	**F 201**
Identify the common factor of the coefficients in the terms of a trinomial expression when a ≠ 1.		**Knowledge**	**B-Application**	**N 301, N 401, N 503, A 508**
	Write a quadratic trinomial as a product of two binomial factors.	**Knowledge**	**B-Application**	**A 508**
Identify and factor a trinomial that is a perfect square or a binomial that is a difference of two squares.		**Knowledge**	**B-Application**	**A 508, N 604, N 605**
	Factor special cases of polynomials within the context of real-world problems.	**Analyze**	**C-Assimilation**	**A 508, N 604, N 605**

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

Week 27
- **Day 1 - 7-1: Combine like terms to simplify polynomials.**
- **Day 2 - 7-2: Multiply two polynomials**
- **Day 3 - Review and Quiz**

Week 28
- **Day 4 - 7-3: Use patterns to multiply binomials.**
- **Day 5 - 7-4: Factoring a polynomial.**
- **Day 6 - Review and Quiz**

Week 29
- **Day 7 - 7-5: Factor a quadratic trinomial.**
- **Day 8 - 7-6: Factor a quadratic trinomial when a ≠ 1.**
- **Day 9 - Review and Quiz**

Week 30
- **Day 10 - 7-7: Factor special trinomials.**

KEY VOCABULARY
- **Closure Property**
- **Degree of monomial**
- **Degree of polynomial**
- **Standard form of polynomial**
- **Difference of two squares**
- **Perfect-square trinomial**

• Day 11 - Review • Day 12 - Test	
ESSENTIAL QUESTION(S) • 7-1: How does adding or subtracting polynomials compare to adding or subtracting integers? • 7-2: How does multiplying polynomials compare to multiplying integers? • 7-3: What patterns are there in the product of the square of a binomial and the product of a sum and a difference? • 7-4: How is factoring polynomials similar to factoring integers? • 7-5: How does recognizing patterns in the signs of the terms help you factor polynomials? • 7-6: How is factoring a quadratic trinomial when $a \neq 1$ similar to factoring a quadratic trinomial when $a = 1$? • 7-7: What special patterns are helpful when factoring a perfect a perfect-square trinomial and the difference of two squares?	**PRIOR KNOWLEDGE** • Factored expressions by identifying the greatest common factor and using distributive property. • Operating with integers and exponents were similar to the concept of adding and subtracting digits with the same place value.

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES	
Proficiency Scale: Standard 5 Proficiency Scale: Standard 7	
RTI	**EXTENSION OPPORTUNITIES**

UNIT 13: Quadratic Functions	DURATION: 3 weeks
CONTENT STANDARDS	
PRIORITY STANDARDS ● **6. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.** ○ **b.Use the vertex form of a quadratic expression to reveal the maximum or minimum value and the axis of symmetry of the function it defines; complete the square to find the vertex form of quadratics with a leading coefficient of one.** ● **12. Create equations in two or more variables to represent relationships between quantities in context; graph equations on coordinate axes with labels and scales and use them to make predictions. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.** ● **13. Represent constraints by equations and/or inequalities, and solve systems of equations and/or inequalities, interpreting solutions as viable or nonviable options in a modeling context. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.** ● **15a. Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.** ● **16. Compare and contrast relations and functions represented by equations, graphs, or tables that show related values; determine whether a relation is a function.** ● **23. Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k \cdot f(x)$, $f(k \cdot x)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs.**	**SUPPORTING STANDARDS** 14. Given a relation defined by an equation in two variables, identify the graph of the relation as the set of all its solutions plotted in the coordinate plane. Note: The graph of a relation often forms a curve (which could be a line). 15b. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. Limit to linear, quadratic, exponential, and absolute value functions. 21. Compare properties of two functions, each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). Extend from linear to quadratic, exponential, absolute value, and general piecewise 26. Use graphs and tables to show that a quantity increasing exponentially eventually exceeds a quantity increasing linearly or quadratically. 28. 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. Note: Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; symmetries; and end behavior. Extend from relationships that can be represented by linear functions to quadratic, exponential, absolute value, and linear piecewise functions. 29. Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. Limit to linear, quadratic, exponential, and absolute value functions. 30. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases. ○ a. Graph linear and quadratic functions and show intercepts, maxima, and minima. 31. Use the mathematical modeling cycle to solve real-world problems involving linear, quadratic, exponential, absolute value, and linear piecewise functions.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
Identify key features of the graph of a quadratic function using graphs, tables, and equations.		**Knowledge**	**Application**	**F 401, AF 303**
Explain the effect of the value of a on the quadratic parent function.		**Analyze**	**C-Assimilation**	**F 401**
Identify key features of the graph of quadratic functions written in vertex form.		**Knowledge**	**A-Acquisition**	**F 401, AF 303**
	Graph quadratic functions in vertex form.	**Application**	**B-Application**	**F 506, AF 603, AF 604, AF 704**
	Graph quadratic functions in standard form and show intercepts , maxima, and minima.	**Application**	**B-Application**	**AF 704, AF 705**
Determine how the values of a,b, and c affect graph of f(x) = ax^2 + bx +c.		**Comprehensive**	**B-Application**	**A 507, AF 704**
Identify key features of parabolas.		**Knowledge**	**A-Acquisition**	**G 609, AF 303**
Compare properties of quadratic functions presented in different forms (algebraically, in a table graphically)		**Analyze**	**B - Application**	**AF 703, N 604**
	Use quadratic functions fitted to data to model real-world situations.	**Analyze**	**C-Assimilation**	**A 506**
	Use the vertical motion model to write an equation.	**Application**	**B - Application**	**None**
Compare a model to a data set by analyzing and evaluating residuals.		**Evaluation**	**D - Adaptation**	**None**
	Determine which model-linear, exponential, or quadratic-best fits a set of data.	**Analyze**	**C - Assimilation**	**F 401**
	Use fitted functions to solve problems in the context of data.	**Analyze**	**C - Assimilation**	**AF 704**

KEY COMPONENTS	
LEARNING TARGETS (incremental learning target by week) **Week 31** ● Day 1 - 8-1: Identify key features of the graph of the quadratic parent functions. ● Day 2 - 8-2: Graph quadratic functions using the vertex form. ● Day 3 - Review and Quiz **Week 32** ● Day 4 - 8-3: Graph quadratic functions using standard form. ● Day 5 - 8-4: Use quadratic functions to model real-world situations. **Week 33** ● Day 6 - 8-5: Determine whether a linear, exponential, or quadratic function best models a data set. ● Day 7 - Review ● Day 8 - Test	**KEY VOCABULARY** ● Parabola ● Quadratic parent function ● Vertex form of a quadratic function ● Standard form of a quadratic function ● Quadratic regression ● Vertical motion model
ESSENTIAL QUESTION(S) ● 8-1: What is the quadratic parent function and how can you recognize the key features of its graph? ● 8-2: How can the vertex form of a quadratic function help you sketch the graph of the functions? ● 8-3: How is the standard form of a quadratic function from the vertex form? ● 8-4: What kinds of real-world situations can be modeled by quadratic functions? ● 8-5: How can you determine whether a linear, exponential, or quadratic function best models data?	**PRIOR KNOWLEDGE** ● Analyzing graphs of functions ● Use functions to model relationships ● Transformations of graph

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES	
Proficiency Scale: Standard 6ab Proficiency Scale: Standard 12 Proficiency Scale: Standard 13	

Proficiency Scale: 15a Proficiency Scale: Standard 21 Proficiency Scale: Standard 23	
RTI	**EXTENSION OPPORTUNITIES**

UNIT 14: Solving Quadratic Equations	**DURATION: 3 weeks**
CONTENT STANDARDS	
PRIORITY STANDARDS • **2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.** • **5. Use the structure of an expression to identify ways to rewrite it. Example: See $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.** • **6a. Factor quadratic expressions with leading coefficients of one, and use the factored form to reveal the zeros of the function it defines.** • **9a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Explain how the quadratic formula is derived from this form.** • **9b. Solve quadratic equations by inspection (such as $x^2 = 49$), taking square roots, completing the square, the quadratic formula, and factoring, as appropriate to the initial form of the equation, and recognize that some solutions may not be real.** • **12. Create equations in two or more variables to represent relationships between quantities in context; graph equations on coordinate axes with labels and scales and use them to make predictions. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.** • **13. Represent constraints by equations and/or inequalities, and solve systems of equations and/or inequalities, interpreting solutions as viable or nonviable options in a modeling context. Limit to contexts arising from linear, quadratic, exponential, absolute value, and linear piecewise functions.**	**SUPPORTING STANDARDS** 3. Define the imaginary number i such that $i^2 = -1$. 11. Create equations and inequalities in one variable and use them to solve problems in context, either exactly or approximately. Extend from contexts arising from linear functions to those involving quadratic, exponential, and absolute value functions. 18. Solve systems consisting of linear and/or quadratic equations in two variables graphically, using technology where appropriate. 19. 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). ○ a. Find the approximate solutions of an equation graphically, using tables of values, or finding successive approximations, using technology where appropriate. Note: Include cases where f(x) is a linear, quadratic, exponential, or absolute value function and g(x) is constant or linear.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
	Use a graph to identify the x-intercepts as solutions of a quadratic equation.	**Application**	**B - Application**	**A 506, AF 603**
	Use a graphing calculator to make a table of values to approximate or solve a quadratic equation.	**Application**	**B - Application**	**A 507**
	Use the Zero-Product Property and factoring to find the solutions of a quadratic equation.	**Application**	**B - Application**	**A 506**
	Apply factoring to solve real-world problems.	**Synthesis**	**C - Assimilation**	**A 508**
	Use the zeros of a quadratic equation to sketch a graph.	**Application**	**B - Application**	**A 506, A 507, A 605,**
	Write the factored form of a quadratic function from a graph.	**Creating**	**B - Application**	**A 508, AF 603**
	Use properties of exponents to rewrite radical expressions.	**Application**	**A - Acquisition**	**N 605**
	Multiply radical expressions.	**Application**	**B - Application**	**None**
	Write a radical expression to model or represent a real-world problem.	**Analyze**	**C - Assimilation**	**None**
	Solve quadratic equations by finding square roots.	**Application**	**B - Application**	**A 507, A 605**
Determine reasonable solutions for real-world problems.		**Evaluation**	**D - Adaptation**	**A 506, AF 704**
	Solve a quadratic trinomial by completing the square to transform a quadratic equation into a perfect square trinomial.	**Synthesis**	**C - Assimilation**	**A 508, A 605**
	Use completing the square to write a quadratic equation in vertex form.	**Application**	**B - Application**	**A 508**

	Derive the quadratic formula by completing the square.	**Creating**	**C - Assimilation**	**A 507, A 601**
	Solve quadratic equations in one variable by using the quadratic formula.	**Application**	**B - Application**	**A 605**
	Use the discriminant to determine the number and type of solutions to a quadratic equation.	**Application**	**C - Assimilation**	**A 506**
Describe a linear-quadratic system of equations.		**Knowledge**	**A - Acquisition**	**F 401**
	Solve a linear-quadratic system of equations by graphing, elimination, or substitution.	**Application**	**B - Application**	**A 506, A 601**

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

Week 34

- **Day 1 - 9-1: Use graphs and tables to find solutions of quadratic equations.**
- **Day 2 - 9-2: Find the solution of a quadratic equation by factoring.**
- **Day 3 - Review and Quiz**

Week 35

- **Day 4 - 9-3: Write equivalent radical expressions.**
- **Day 5 - 9-4: Solve quadratic equations by taking square roots.**
- **Day 6 - Review and Quiz**

Week 36

- **Day 7 - 9-5: Use completing the square to solve quadratic equations.**
- **Day 8 - 9-6: Use the quadratic formula to solve quadratic equations.**
- **Day 9 - Review and Quiz**

Week 37

- **Day 10 - 9-7: Solve a system with linear and quadratic equations.**
- **Day 11 - Review**
- **Day 12 - Test**

KEY VOCABULARY

- **Quadratic equation**
- **Zeros of a function**
- **Standard form of a quadratic equation**
- **Zero-Product Property**
- **Product Property of Square Roots**
- **Completing the Square**
- **Discriminant**
- **Quadratic formula**
- **Root**
- **Linear-Quadratic System**

ESSENTIAL QUESTION(S)

- **9-1: How can graphs and tables help you solve quadratic**

PRIOR KNOWLEDGE

- **Solving linear equations**

equations? • 9-2: How does factoring help you solve quadratic equations? • 9-3: How does rewriting radicals in different forms help you communicate your answer? • 9-4: How can square roots be used to solve quadratic equations? • 9-5: How is the technique of completing the square helpful for analyzing quadratic functions? • 9-6: When should you use the quadratic formula to solve equations? • 9-7: How is solving linear-quadratic systems of equations similar to and different from solving systems of linear equations?	• Solving systems of linear equations • Graphing quadratic functions

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES	
Proficiency Scale: Standard 2 Proficiency Scale: Standard 5 Proficiency Scale: 6ab Proficiency Scale: 9a Proficiency Scale: Standard 12 Proficiency Scale: Standard 13	
RTI	EXTENSION OPPORTUNITIES

UNIT 15: Working with Functions	DURATION: 2 weeks

CONTENT STANDARDS

PRIORITY STANDARDS

- **20. Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes, using technology where appropriate.**

SUPPORTING STANDARDS

15b. Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. Limit to linear, quadratic, exponential, and absolute value functions.

17. Combine different types of standard functions to write, evaluate, and interpret functions in context. Limit to linear, quadratic, exponential, and absolute value functions.

- a. Use arithmetic operations to combine different types of standard functions to write and evaluate functions. Example: Given two functions, one representing flow rate of water and the other representing evaporation of that water, combine the two functions to determine the amount of water in a container at a given time.
- b. Use function composition to combine different types of standard functions to write and evaluate functions. Example: Given the following relationships, determine what the expression S(T(t)) represents.

Function	Input	Output
G	Amount of studying: s	Grade in course: $G(s)$
S	Grade in course: g	Amount of screen time: $S(g)$
T	Amount of screen time: t	Number of followers: $T(t)$

18. Solve systems consisting of linear and/or quadratic equations in two variables graphically, using technology where appropriate.

28. 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. Note: Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; maximums and minimums; symmetries; and end behavior. Extend from relationships that can be represented by linear functions to quadratic, exponential, absolute value, and linear piecewise functions.

KNOWLEDGE (students need to know):	SKILLS (students need to be able to do):	BLOOM'S TAXONOMY	QUAD	ACT
	Graph translations of the square root function.	**Applying**	**B - Application**	**AF 604. N 604, A 509**
	Calculate and interpret the average rate of change for a square root function over a specified interval.	**Applying**	**B - Application**	**A 406**
Identify key features of the graph of cube root functions and graph translations of them.		**Remembering**	**C - Assimilation**	**A 510, AF 604**
	Model real-world situations using the cube root function.	**Synthesis**	**A - Acquisition**	**A 510**
	Calculate and interpret the average rate of change of a cube root function over a specified interval.	**Applying**	**B - Application**	**A 510, A 406**
Relate the domain and range of a function to its graph.		**Application**	**B - Application**	**F 506, AF 704**
	Analyze the key features of the graph of a function to identify the type of function it represents.	**Analysis**	**C - Assimilation**	**N 404, AF 703**
	Graph translations of absolute value, exponential, quadratic, and radical functions.	**Applying**	**B - Application**	**N 404, A 506**
	Determine how combining translations affects the key features of the graph of a function.	**Evaluation**	**C - Assimilation**	**AF 604, AF 706**
Identify the effect on the graph of a function of multiplying the output by -1.		**Knowledge**	**C - Assimilation**	**AF 604, AF 706**
Identify the effect on the graph of a function of replacing f(x) by kf(x) or f(kx) for specified values of k.		**Knowledge**	**C - Assimilation**	**AF 604, AF 706**
	Combine functions using arithmetic operations, including addition, subtraction,	**Application**	**B - Application**	**AF 702**

	and multiplication.			
	Combine functions to solve real-world problems.	**Application**	**D - Adaptation**	**AF 702**
	Write an equation for the inverse of a linear function.	**Knowledge**	**B - Application**	**None**
	Write the inverse of a quadratic function after restricting the domain so the original function is one-to-one.	**Knowledge**	**B - Application**	**None**

KEY COMPONENTS

LEARNING TARGETS (incremental learning target by week)

Week 38

- **Day 1 - 10-1: Describe the key features of the square root function.**
- **Day 2 - 10-2: Identify the key features of the cube root function.**
- **Day 3 - Review and Quiz**

Week 39

- **Day 4 - 10-3: Identify the common features of a function when given an equation or graph.**
- **Day 5 - 10-4: Graph and analyze transformations of functions.**
- **Day 6 - Review and Quiz**

Week 40

- **Day 7 - 10-5: Change functions to compare or stretch their graphs.**
- **Day 8 - 10-6: Add, subtract, and multiply functions.**
- **Day 9 - Review and Quiz**

Week 41

- **Day 10 - 10-7: Use inverse functions to solve problems.**
- **Day 11 - Review**
- **Day 12 - Test**

KEY VOCABULARY

- **Square Root Function**
- **Cube Root Function**
- **Inverse of a Function**

ESSENTIAL QUESTION(S)

- **10-1: What key features are shared among the square root function and translations of the square function?**
- **10-2: What are the key features of the cube root function?**
- **10-3: What can you learn about a function by analyzing its graph?**
- **10-4: Do horizontal and vertical translations work in the same way for all types of functions?**
- **10-5: What change to a function will result in a vertical or**

PRIOR KNOWLEDGE

- **Translations of Functions**
- **Key features of functions**
- **Average Rate of Change**

horizontal stretch or compression of its graph? • 10-6: How can you extend addition, subtraction, and multiplication from numbers to functions? • 10-7: How can you use inverse functions to help solve problems?	

FORMATIVE ASSESSMENT	SUMMATIVE ASSESSMENT

ACTIVITIES & RESOURCES	
Proficiency Scale: Standard 20	
RTI	EXTENSION OPPORTUNITIES