Algebra 1 Pacing Guide 2022-23

Purpose of Algebra 1: To formalize and extend the mathematics that students learned in the middle grades. Because it is built on the middle grades standards, this is a more ambitious version of Algebra I than has generally been offered. The units deepen and extend understanding of linear and exponential relationships by contrasting them with each other and by applying linear models to data that exhibit a linear trend, and students engage in methods for analyzing, solving, and using quadratic functions. The Mathematical Practice Standards apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.

- Warm-ups are to be given in Mastery Connect or if given on paper, entered into Mastery Connect. While there is one Warm-up listed for each day, as long as the warm ups are given in the correct week teacher discretion can be used in assigning these.
- For each unit, there is a Diversity, Equity, and Inclusion activity. It is not required and can be modified to use as in class activity. Other DEI activities can be found at Skew the Script and Math and Social Justice websites.
- Algebra 1 Tentative BenchmarkTesting Schedule:
    - Benchmark 1: September 12-16
    - Benchmark 2: December 5-9
    - Benchmark 3: March 20-23
    - EOC Window: April 24 - May 19

Each row represents one instructional block.
Note: MLS to CCSS are organized in a 1:1 correlation (first MLS with first CCSS, second MLS with second CCSS.)

First Semester

Introduction to Algebra 1 Class

DEI Activity: Get to know your kids and find a puzzle or activity to match their personalities and interests. There are many different types of puzzles to get the conversation started. Use this as a way to talk about math while learning about your class.

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Aug 22 / 23			1. **Get to know your students** 2. **Create a cooperative learning environment** 3. **Have students work together to build classroom rules and expectations** 4. **Explain to students about working in a thinking classroom**	Introduction Get to Know You Classroom Expectations
Aug 24 / 25		Cat/Mouse Thinking	1. **Placement Tests will be given to determine correct**	Placement Test

		Problem Tax Collector Thinking Problem	**placement into FOA and Algebra 1. Moves can be made based on what students score. Each High School IC will make a copy of the placement test to be shared with their teachers in the building (Make sure to change the teachers names and hours you need accordingly.)**	Thinking Problem

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Unit 1 - Descriptive Statistics in Univariate Data

Students analyze contextual situations and focus on single-variable data. Students are introduced to the concept of using data to make predictions and judgments about a situation. Univariate data is described through shape, center, and spread by using mathematical calculations to support their reasoning. Students begin to make judgments about whether data is consistent (analysis of spread) and whether mean or median is a better representation of a situation (center).

DEI Activity: Follow the link for a bank of graphs and find one to fit your students and their needs.

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Aug 26 / 29 **Warm Up A**	**MLS** **A1.DS.A.1** **A1.DS.A.2** **A1.DS.A.3** **CCSS** **HSS-ID.A.1** **HSS-ID.A.2** **HSS-IC.A.1**	I can describe statistics. I can represent data in frequency graphs and identify the center of a data set.	1. **Explain that statistics is the science of collecting and analyzing large amounts of information.** 2. **Explain descriptive statistics as summarizing the information collected.** 3. **Explain that inferential statistics is when you use information collected from a sample to make inferences about a population.** 4. **Describe the similarities and differences between the frequency graphs of bar graphs and histograms.**	FTL Unit 2 Lesson 1
Aug 30 / 31 **Warm Up B**	**MLS** **A1.DS.A.1** **A1.DS.A.2** **CCSS** **HSS-ID.A.1** **HSS-ID.A.2**	I can describe and calculate the center and spread. I can represent data in a box plot (box-and-whisker plot) and histogram I can identify when the median and mean are not the same value. Given summary statistics, I can describe the best measures of center and spread.	1. **Understand that box plots are a way to organize univariate data, and identify the variable that the box plot is describing.** 2. **Describe center as a measurement of the middle of the data set. Median and mean are two measures of center.** 3. **Describe spread as how spread apart the data is in relation to the center. Interquartile range is a measure of spread.** 4. **Create box plots using 5 number summaries.** 5. **Identify the percentage of data that is located in each of the four quartiles, and analyze the box plot based on this information.** 6. **Describe that the middle 50% of the data is one measure of how spread out the data in the data set are.**	FTL Unit 2 Lesson 2 FTL Unit 2 Lesson 3 FTL Unit 2 Lesson 9

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			7. Understand that histograms are a way to organize univariate data and identify the variable that the histogram is describing. 8. Find the mean and median of a data set, and mark these in the histogram. 9. Describe why the mean and median may not be in the same location. 10. Make conjectures about the data set based on the location of the mean and the median. 11. Use the measures of center, shape, and spread to describe a data set and/or a graph.	
Sept 1 / 2 Warm Up C	MLS A1.DS.A.2 A1.DS.A.3 CCSS HSS.ID.A.2 HSS.ID.A.3	I can correctly identify the shape of data. I can calculate and interpret the spread of a data set.	1. Understand that shape describes the skew of a data set. 2. Describe a data set as skew right, symmetrical, or skew left, depending on the relationship of the mean to the median of a data set. 3. Describe how outliers affect the mean and the median, and how this appears in the shape of the graph. 4. Describe that a symmetrical shape is when the mean and the median are equal and is loosely referred to as a "normal distribution." 5. Identify median as “outlier resistant,” which means that it does not change when a data item is replaced by an outlier. 6. Describe the shape of a data set where the mean is greater than the median as skew right, or positively skewed. 7. Describe the shape of a data set where the median is greater than the mean as skew left, or negatively skewed.	FTL Unit 2 Lesson 4 FTL Unit 2 Lesson 5
Sept 7 / 8		Unit 1 Assessment	Unit 1 Assessment given in Mastery Connect (Paper Copy for students with accommodations/paper copy needs)	FTL Unit 2 Lesson 10 FTL Unit 2 Lesson 11 FTL Unit 2 Lesson 12

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Unit 2: Functions, Graphs, and Features

Students are introduced to all of the main features of functions they will learn throughout the year through basic graphical modeling of contextual situations. Students will learn function notation and use this to analyze and express features of functions represented in graphs and contextually. Students will use the tools of domain and range, rates of change, intercepts, and where a function is changing to describe contextual situations. Students are introduced to the concept of a function transformation—a key concept in identifying functions that model situations but are shifted, reflected, or dilated to represent the characteristics of the particular situation.

DEI Activity:

Topic A: Features of Functions

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Sept 9 / 12 **Warm Up D**	**MLS** **A1.IF.A.1** **A1.IF.A.2** **A1.IF.B.3** **A1.IF.B.5** **A1.NQ.B.3** **A1.NQ.B.4** **A1.NQ.B.5** **CCSS** **HSF.IF.A.1** **HSF.IF.A.2** **HSF.IF.B.4** **HSF.IF.B.6** **HSN.Q.A.1** **HSN.Q.A.2** **HSN.Q.A.3**	**I can model a contextual linear situation graphically using appropriate scales and features.** **I can define functions and evaluate points in tables, graphs, and contextual situations using functions notation.** **I can analyze the key features of a contextual situation and model these graphically.**	**1. Identify variables to represent a contextual situation.** **2. Determine whether the variables represented are independent or dependent variables.** **3. Identify key features of the situation to represent graphically based on the context of the situation (start of the situation, when changes occur, at the end of the situation).** **4. Describe the shape of the graph as relates to the context of the situation (the what) over particular** **5. Define functions as relationships where each input has only one output in contextual and non-contextual situations represented in table, mappings, and graphs.** **6. Use function notation to describe a function of a situation by denoting the function f. Describe the input as x, the output as f(x) and a coordinate point in function notation (e.g., f(3) = 5 is the coordinate point (3, 5)).** **7. Evaluate a function represented graphically given in function notation.** **8. Use appropriate language to represent functions ("f of x"), and describe a situation in terms of independent variables (i.e., "Time is a function of distance." Represent this as function notation where t is the time, and f(t) represents the distance.)intervals (the where).**	FTL Unit 1 Lesson 1 FTL Unit 1 Lesson 2 FTL Unit 1 Lesson 7

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			9. Interpret a graph in the context of a situation, and use sketches of graphs to illustrate contextual situations. Note descriptions such as fast, slow, constantly, increasing, and decreasing.	
Sept 13 / 14		BENCHMARK 1	COMEPELTE BENCHMARK 1 WINDOW OPEN SEPT 12-16	
Sept 15 / 16 Warm Up E	MLS A1.IF.A.1 A1.IF.A.2 A1.IF.C.9 CCSS HSF.IF.A.1 HSF.IF.A.2 HSF.IF.C.9	I can identify features of functions, including x-intercept and y-intercept, in context. I can evaluate function notation in Context. I can define functions and evaluate points in tables, graphs, and contextual situations using functions notation. I can analyze the key features of a contextual situation and model these graphically.	1. Define functions as relationships where each input has only one output in contextual and non-contextual situations represented in tables and graphs. 2. Use function notation to describe a function of a situation by denoting the function f. Describe the input as x, the output as f(x) and a coordinate point in function notation (e.g., f(3) = 5 is the coordinate point (3, 5)). 3. Evaluate a function represented graphically given in function notation. 4. Use appropriate language to represent functions ("f of x"), and describe a situation in terms of independent variables (i.e., "Time is a function of distance." Represent this as function notation where t is the time, and f(t) represents the distance.) 5. Describe that a function can be represented algebraically, verbally, graphically, or in a table of values. 6. Describe when a function is linear and whether the linear relationship is proportional. 7. Evaluate functions presented in function notation—either in equation or coordinate point form. 8. Describe how to find the y-intercept, x-intercept, and interval in a function presented algebraically, graphically, and in tabular form. 9. Interpret the intercepts of a contextual situation	FTL Unit 1 Lesson 2 FTL Unit 1 Lesson 3 FTL Unit 1 Lesson 7

			with and without function notation 10. Interpret a graph in the context of a situation, and use sketches of graphs to illustrate contextual situations. Note descriptions such as fast, slow, constantly, increasing, and decreasing.	
Sept 19 /20 Warm Up F	MLS A1.IF.A.1 A1.IF.B.3 A1.IF.B.4 A1.IF.B.5 A1.IF.C.9 A1.NQ.B.4 CCSS HSF.IF.A.1 HSF.IF.B.4 HSF.IF.B.5 HSF.IF.B.6 HSF.IF.C.9 HSN.Q.A.2	I can identify the domain and range through contextual situations, and explore domain and range on a graph. I can represent domain and range with inequalities. I can analyze the key features of a contextual situation and model these graphically.	1. Describe domain as the set of all possible inputs for the independent variable for a context and as the corresponding x-coordinates on the coordinate plane. 2. Describe the range as the set of all possible outputs for the dependent variable for a context and as the corresponding y-coordinates on the coordinate plane. 3. Identify the domain and range of a function presented algebraically, verbally, graphically, and in contexts. 4. Interpret a graph in the context of a situation, and use sketches of graphs to illustrate contextual situations. Note descriptions such as fast, slow, constantly, increasing, and decreasing.	FTL Unit 1 Lesson 4 FTL Unit 1 Lesson 7
Sept 21 / 22 Warm Up G	MLS A1.IF.A.2 A1.IF.B.3 A1.IF.B.4 A1.IF.B.5 A1.IF.C.9 A1.NQ.B.4 CCSS HSF.IF.A.2 HSF.IF.B.4 HSF.IF.B.5 HSF.IF.B.6 HSN.Q.A.2	I can calculate and interpret the rate of change from two points on a graph, in a situation, or in function notation. I can analyze the key features of a contextual situation and model these graphically.	1. Describe the average rate of change as how much the range of an interval changes relative to the domain of an interval. 2. Find the rate of change between two endpoints of an interval to represent the average rate of change over that interval. 3. Represent intervals in an inequality showing the range of domain represented, two points given in function notation, coordinate points, or rows in a table of values. 4. Describe that the rate of change of a linear function is always constant. 5. Use the rates of change over different intervals to interpret a function. 6. Interpret a graph in the context of a situation, and	FTL Unit 1 Lesson 5 FTL Unit 1 Lesson 7

			use sketches of graphs to illustrate contextual situations. Note descriptions such as fast, slow, constantly, increasing, and decreasing.	
Sept 23 / 26 **Warm Up H**	**MLS** **A1.IF.B.3** **A1.IF.B.4** **A1.IF.B.5** **A1.NQ.B.4** **CCSS** **HSF.IF.B.4** **HSF.IF.B.5** **HSF.IF.B.6** **HSN.Q.A.2**	**I can describe and sketch functions using the features of domain and range, intercepts, function behavior, and the value of the function.** **I can analyze the key features of a contextual situation and model these graphically.**	1. **Describe the intervals of a function according to the behavior of the function (increasing, decreasing, constant).** 2. **Describe the intervals of a function according to the value of the function (positive, negative, zero).** 3. **Describe the intervals of a function according to important points and the x and y intercepts.** 4. **Use inequalities to describe the intervals where a function meets certain criteria.** 5. **Draw a sketch of a function according to particular features.** 6. **Interpret a graph in the context of a situation, and use sketches of graphs to illustrate contextual situations. Note descriptions such as fast, slow, constantly, increasing, and decreasing.**	FTL Unit 1 Lesson 6 FTL Unit 1 Lesson 7
Sept 27 / 28 **Quiz Day 1-6**			**Teachers create their own quiz or activity based on student need. This will not be reflected in district data as these standards will be assessed at the end of unit 2.**	**FTL Unit 1 Lesson 1 - Lesson 7**

Topic B: Nonlinear Functions

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Sept 29 / 30 **Warm Up I**	**MLS** **A1.CED.A.2** **A1.IF.B.4** **A1.IF.C.7** **A1.IF.C.7** **A1.LQE.A.2** **CCSS**	**I can draw quadratic functions represented contextually.** **I can identify key features of the graph and relate to context.**	1. **Describe that a contextual situation is nonlinear, and identify the features that make the function nonlinear.** 2. **Describe that a parabola is a shape used to describe quadratic functions.** 3. **Describe the rate of change over intervals of a quadratic function. Compare the rate of change to a linear function.**	FTL Unit 1 Lesson 8 FTL Unit 1 Lesson 9

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	HSA.CED.A.2 HSF.IF.B.5 HSF.IF.C.7.a HSF.IF.C.7.e HSF.LE.A.3	I can sketch an exponential function that represents a situation. I can identify key features of the graph and relate to context.	4. Identify contexts that could be represented by a quadratic function, such as profit, falling objects, thrown objects, and area relationships. 5. Describe the domain and range of quadratic functions as well as features of quadratic functions represented graphically. 6. Describe the shape that is used to model exponential functions. 7. Describe the rate of change over intervals of an exponential function. Compare the rate of change to a linear function and to a quadratic function. 8. Identify contexts that could be represented by an exponential function, such as interest, population growth, car depreciation, and bacteria growth. 9. Describe the domain and range of exponential functions, as well as features of the exponential functions represented graphically.	
Oct 3 / 4 Warm Up J	MLS A1.REI.C.6 A1.IF.A.2 A1.IF.B.4 CCSS HSA.REI.D.11 HSF.IF.A.2 HSF.IF.B.5	I can draw a graph to represent a system of functions. Identify the solution to a system represented graphically and in context.	1. Describe a system of functions as any set of functions that happen over the same domain. 2. Describe that the solution to a system of functions is when the functions intersect. 3. Describe the intersection of the where both functions have the SAME coordinate point (same x-coordinate, same y-coordinate). For example, in a distance/time graph, the intersection point is where both the distance and the time is the same for both functions. 4. Describe the solution to a system of functions in context.	FTL Unit 1 Lesson 10
Oct 5 / 6 Warm Up K	MLS A1.IF.B.3 CCSS HSF.IF.B.4	I can analyze functions and identify parent functions of graphs. I can identify variables of a situation and the scale	1. Define variables presented in a problem in context. 2. Identify an appropriate domain and range based on the context presented. 3. Model a contextual situation graphically, representing the intervals where a function is	FTL Unit 1 Lesson 11

		of the associated graph. **I can represent a situation in a graph, table, and description.**	**increasing/decreasing/constant, whether a function is linear, intercepts, and other key points.** **4. Interpret a situation represented graphically for intervals of interest, points of interest, and comparison in rates of change.**	

Topic C: Function Transformations

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Oct 7 / 10 **Warm Up L**	**MLS** **A1.BF.A.1** **A1.IF.B.3** **A1.IF.B.4** **CCSS** **HSF.BF.B.3** **HSF.IF.B.4** **HSF.IF.B.5**	**I can identify and describe vertical translations of functions.** **I can identify and describe horizontal translations of functions.**	**1. Understand that the graphs of functions can undergo transformations that move the graph around the coordinate plane.** **2. Identify and graph the parent functions of** **3. f(x) = x, f(x) = absolute value, f(x) = quadratic, f(x) = cubic, f(x) = square root.** **4. Identify when the graph of a function has been shifted vertically, both in a graph and in an equation.** **5. Describe how to shift a function's graph vertically in a table of values or graphically.** **6. Draw graphs of functions that have been translated vertically.** **7. Write equations, in function form, to represent graphs of functions that have been translated vertically using k to represent the vertical translation (i.e., f(x)+k).** **8. Identify when the graph of a function has been shifted horizontally, both in a graph and in an equation.** **9. Describe how to shift a function's graph horizontally in a table of values or graphically.** **10. Draw graphs of functions that have been translated horizontally.** **11. Write equations, in function form, to represent graphs of functions that have been translated horizontally using h to represent the horizontal**	FTL Unit 5 Lesson 12 FTL Unit 5 Lesson 13

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			translation (i.e., f(x+h)	
Oct 11 /12 Warm Up M	MLS A1.BF.A.1 A1.IF.B.4 CCSS HSF.BF.B.3 HSF.IF.B.5	I can identify and describe vertical scaling of functions, including reflections over the x-axis.	1. Identify when the graph of a function has been scaled vertically, both in a graph and in an equation. 2. Describe how to scale a function's graph vertically in a table of values or graphically. 3. Draw graphs of functions that have been scaled vertically. 4. Write equations, in function form, to represent graphs of functions that have been scaled vertically using a to represent the vertical scale (i.e., af(x)). 5. Differentiate between vertical stretches, where a is a positive number > 1 and vertical shrinking, where a is a positive number < 1 6. Understand that when a is negative, then the graph of the function is reflected over the x-axis.	FTL Unit 5 Lesson 14
Oct 13 / 14 Warm Up N	MLS A1.SSE.A.3 A1.BF.A.1 A1.IF.B.3 A1.IF.C.8 CCSS HSA.SSE.B.3 HSF.BF.B.3 HSF.IF.B.4 HSF.IF.C.8	I can apply transformations to functions. I can describe features of the vertex form of a quadratic function and write quadratic equations in vertex form from graphs.	1. Describe multiple transformations of a function. 2. Write the equation, in function notation, for a graph that represents multiple transformations of a function. 3. Identify the vertex from an equation written in vertex form, $f(x)=a(x-h)2+k$ where the vertex is (h,k) 4. Describe the features that different forms of quadratic equations reveal about the graph of the function. 5. Write the equation for a quadratic function given as a graph or a function described verbally; use the most appropriate form of the equation.	FTL Unit 5 Lesson 16 FTL Unit 8 Lesson 1
Oct 17 / 18		Flex Day		
Oct 19 / 20		Unit 2 Assessment	Unit 2 Assessment in Mastery Connect (Paper Copy for students with accommodations/paper copy needs)	

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— End of First Quarter —				

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Unit 3: Descriptive Statistics in Bivariate Data

Bivariate data is analyzed for whether the variables are related and whether a linear model is the best function to fit a set of data (analysis of residuals); students also develop a linear model that can be used to predict future events. Students are introduced to the modeling cycle.

DEI Activity: Follow the link for a bank of graphs and find one to fit your students and their needs.

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Oct 24 / 25 **Warm Up O**	**MLS** **A1.DS.A.4** **CCSS** **HSS-ID.B.5**	**I can define categorical and numerical data. Create two-way tables to organize bivariate categorical data.** **I can describe relative and relative conditional frequencies of two-way tables.**	**1. Identify the graphs that are used for univariate data as bar graphs, circle graphs, histograms, box plots, and dot plots. Describe that they all measure the frequency of that one variable.** **2. Describe bivariate data as comparing or combining two variables.** **3. Identify the graphs that are used for bivariate data as scatterplots, line graphs, and two-way frequency tables.** **4. Describe that two-way tables organize information that compare two categorical variables.** **5. Describe the ways we can use two-way tables to compare.** **6. Use given information to create a two-way table.** **7. Describe that frequencies are measured not only in fixed amounts but also in relative percentages.** **8. Understand that when the percentage of one category is calculated in comparison to the total of another category or the total of the data set, this is a relative frequency.** **9. Calculate the relative frequency by determining which category total the frequency is relative to. Calculate the relative frequency compared to the sample: "What percent of people surveyed own a red car?", the relative frequency compared to another variable: "What percentage of women own a red car?", or the relative frequency of two**	FTL Unit 2 Lesson 13 FTL Unit 2 Lesson 14

			combined variables to the sample: "What percentage of the people surveyed are women who own red cars?" 10. Describe possible associations between variables in a two-way table.	
Oct 26 / 27 Warm Up P	MLS A1.DS.A.4 A1.DS.A.7 A1.DS.A.8 CCSS HSS-ID.B.6 HSS-ID.C.8 HSS-ID.C.9	I can create scatter plots and identify function shapes in scatter plots. I can calculate, with technology, the correlation coefficient for a data set. I can explain why correlation does not determine causation.	1. Understand that scatterplots compare the relationship between two quantitative variables. 2. Create scatterplots by identifying appropriate variables (and assignment of assumed dependent/independent) and appropriate scales. 3. Make observations about the clustering, outliers, and general shape of the collection of points on the scatterplot. 4. Identify the most appropriate function shape for the collection of points in a scatterplot. 5. Relate the shape of the graph and clustering to a positive association, negative association, or no association. 6. Make conjectures about the relationship between the two variables based on the visual appearance of the strength of association. 7. Distinguish between correlation and causation, describing that a strong association does not indicate that the independent variable causes the dependent variable. 8. Explain that the correlation coefficient quantifies the strength and direction of association between two variables. 9. Describe the general categories of correlation—the strength (strong, moderate, and weak) and kind of association (positive/negative). 10. Use the correlation coefficient to explain the strength of correlation. Identify |0.1|-|0.3| as a weak correlation, |0.4|-|0.6| as a moderate correlation, and |0.7|-|0.9| as a strong correlation. 0 is no correlation, and |1.0| is perfect correlation.	FTL Unit 2 Lesson 15 FTL Unit 2 Lesson 16

			11. Explain that just because two variables are correlated does NOT mean that one variable causes the other to happen. 12. Explain the limits of the correlation coefficient—i.e., that the correlation coefficient only describes how closely the points are related linearly, not in any other function type.	
Oct 31 / Nov 1 Warm Up Q	MLS A1.DS.A.5.b A1.DS.A.5.a A1.DS.A.5.a A1.DS.A.6 CCSS HSS-ID.B.6a HSS-ID.B.6b HSS-ID.B.6c HSS-ID.C.7	I can determine the function of best fit and create a linear equation from least squares regression using technology. I can use residuals to assess the strength of the model for a data set.	1. Identify the overall shape of the points in the scatterplot and assign a function of best fit. 2. Describe the difference between the actual data (the points on the scatterplot) and the generality or prediction formed by the function of best fit. 3. Generalize the trend of a set of data represented in a scatterplot by estimating a line of best fit and writing an appropriate equation. 4. Interpret the slope (rate of change) and the intercept (constant) in terms of the context being modeled. 5. Explain that the “least squares regression” is a technical term for calculating, rather than estimating, the line of best fit. “Least squares” refers to the use of residuals to determine how “good” your function is. 6. Understand that a regression can be calculated in any function (quadratic regression, exponential regression) to develop an algebraic model that fits the situation well. We refer to this as the “function of best fit.” 7. Use a calculator to identify the slope and intercept for the line of best fit for a set of data. 8. Compare the calculated least squares regression with the estimated line of best fit. 9. Explain that the least squares regression line is the predicted model for the data, whereas the data points are the actual data. 10. Describe that while you can fit various functions	FTL Unit 2 Lesson 17 FTL Unit 2 Lesson 18

			to a set of data and develop an algebraic model, the focus in this unit is on fitting and analyzing a linear model. 11. Relate the standard deviation (distance from the mean) with comparing the actual data points in a scatterplot from the distance from the line of best fit. 12. Calculate the residuals between the actual data and the line of best fit. 13. Describe that by plotting and analyzing the residuals, you can make a conjecture about whether a particular function is appropriate for a set of data and variables. 14. Analyze a residual plot for randomness. If a residual plot has a random pattern, the function is likely an appropriate model for the relationship between the two variables.	
Nov 2 / 3 Warm Up R	MLS A1.DS.A.5.b A1.DS.A.6 A1.DS.A.8 CCSS HSS-ID.B.6a HSS-ID.C.7 HSS-ID.C.9	I can describe the relationship between two quantitative variables in a contextual situation represented in a scatterplot using the correlation coefficient, least squares regression, and residuals as evidence.	1. Describe bivariate by the shape (function of best fit, as determined by the residuals), center (equation of line or function of best fit), and spread (correlation coefficient and analysis of residuals). 2. Analyze bivariate data to describe a plausible relationship using information about a set of data's linearity, correlation, line of best fit, and related residuals. 3. Explain that correlation does not indicate causality, so one variable cannot be determined to cause another. 4. Understand that in a scatterplot, there is the actual data (points) and the prediction (equation modeling the line or function of best fit). 5. Make predictions about the contextual situation based on the least squares regression line	FTL Unit 2 Lesson 19
Nov 4 / 7		Unit 3 Assessment	Unit 3 Assessment in Mastery Connect	

			(Paper Copy for students with accommodations/paper copy needs)	

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Unit 4: Linear Expressions & Single Variable Equations/Inequalities

Students become proficient at manipulating and solving single-variable linear equations and inequalities, as well as using linear expressions to model contextual situations. Domain and range are introduced again through the lens of a "constraint" with inequalities. The understanding students develop in this unit builds the foundation for future units as well as provides an algebraic outlet for modeling contextual situations.

DEI Activity: Use the different worksheets to practice expressions and equations. In addition to answering all the questions, have students research the person who is the answer to the riddle. Have them bring one interesting fact back to class the next day to share out.

Topic A: Properties and Solutions of Single-Variable Linear Expressions and Equations

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Nov 9 / 10 **Warm Up S**	**MLS** **A1.REI.A.1** **A1.SSE.A.1** **A1.SSE.A.2** **CCSS** **HSA.REI.A.1** **HSA.SSE.A.1** **HSA.SSE.A.2**	**I can identify properties of operations that result in equivalent linear expressions.**	1. **Identify and apply the commutative, associative, and distributive properties in expressions.** 2. **Describe that for two expressions to be equivalent, they must be equivalent for ALL values of x, not just one value of x.** 3. **Transform an expression, one step at a time, into an equivalent expression.** 4. **Identify and correct incorrect steps taken to transform an algebraic expression.** 5. **Use appropriate vocabulary to describe components of expressions and equations.**	FTL Unit 3 Lesson 1
Nov 11 / 14 **Warm Up T**	**MLS** **A1.REI.A.1** **CCSS** **HSA.REI.A.1**	**I can use properties of equations to analyze and write equivalent equations.**	1. **Describe how the value of a term or expression will change with respect to another to maintain an equality between both sides of the equal sign.** 2. **Formalize the saying "whatever you do to one side, you do to the other" as "(operation) property of equality."** 3. **Explain how the properties of operations are different from the properties of equality.** 4. **Create equivalent equations using properties of operations and equality.**	FTL Unit 3 Lesson 2
Nov 15 / 16	**MLS**	**I can solve single-variable**	1. **Use additive and multiplicative identity properties**	FTL Unit 3 Lesson 3

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Warm Up U	A1.REI.A.1 A1.CED.A.1 CCSS HSA.REI.A.1 HSA.REI.B.3	linear equations using properties of equality.	to solve an equation. 2. Identify efficient methods to solve a linear equation using properties of equality. 3. Describe that each step in solving an equation creates an equation that is equivalent to the rest of the equations created. 4. Identify the reason(s) for each step in solving an equation. 5. Check solutions by substituting calculated values in the equation. Describe how you know your solution makes sense.	
Nov 17 / 18 Warm Up V	MLS A1.CED.A.1 A1.IF.A.1 CCSS HSA.REI.B.3 HSF.IF.A.1	I can solve equations with a variable in the denominator.	1. Describe that dividing by zero produces an expression that is undefined. 2. Describe that when a variable is the divisor, there is a "domain restriction" on possible values for the variable so the expression is defined. 3. Identify the domain restriction when there is a variable in the denominator. 4. Identify equations with no solutions, based on a domain restriction of one side of the equation. 5. Efficiently solve an equation with a variable in the denominator.	FTL Unit 3 Lesson 4
Nov 28 / 29 Warm Up W	MLS A1.CED.A.4 CCSS HSA.CED.A.4	I can solve for a variable in an equation or formula.	1. Describe what it means when you are "solving for" a variable in an equation. 2. Describe how solving for a "quantity of interest" provides useful information about a relationship. 3. Derive multiple relationships in known formulas by solving for different variables.	FTL Unit 3 Lesson 5

Topic B: Modeling with Single-Variable Linear Equations

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Nov 30 / Dec 1	MLS A1.CED.A.1	I can write equations using defined variables to	1. Define units associated with variables. 2. Write simple expressions and equations to	FTL Unit 3 Lesson 6 FTL Unit 3 Lesson 7

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Warm Up X	**A1.CED.A.2** **A1.CED.A.4** **A1.LQE.A.3** **A1.IF.B.4** **A1.NQ.B.3** **CCSS** **HSA.CED.A.1** **HSA.CED.A.2** **HSA.CED.A.4** **HSF.BF.A.1** **HSF.IF.B.5** **HSN.Q.A.1**	**represent a contextual situation.** **I can define variables; write and solve equations to represent a contextual situation.**	**model contextual situations.** **3. Use known quantities to try the algebraic model developed and determine reasonability of the model.** **4. Assign domain restrictions based on context and algebraic relationships.** **5. Rearrange the equation used to model a relationship to highlight a quantity of interest.** **6. Use nested expressions to describe a larger model.** **7. Define variables and units from a contextual situation.** **8. Write simple expressions and equations to model contextual situations.** **9. Use known quantities to try the algebraic model developed and determine reasonability.** **10. Assign domain restrictions based on context and algebraic relationships.** **11. Rearrange equation used to model a relationship to highlight a quantity of interest.** **12. Use nested expressions to describe a larger model.** **13. Solve contextual problems and interpret solution in the context of a problem.**	
Dec 2 / 5 **Warm Up Y**	**MLS** **A1.CED.A.1** **A1.CED.A.2** **A1.CED.A.4** **A1.LQE.A.3** **A1.IF.B.4** **A1.NQ.B.3** **CCSS** **HSA.CED.A.1** **HSA.CED.A.2** **HSA.CED.A.4**	**I can write and solve equations to represent contextual situations where estimations and unit conversions are required.** **I can model a contextual situation and make an informed decision based on the model.**	**1. Define variables and units from a contextual situation.** **2. Identify unit conversions and incorporate unit conversions in the definition of the variable or the algebraic model.** **3. Write expressions and equations to model contextual situations.** **4. Use known quantities or estimated quantities to try the algebraic model developed and determine reasonability.** **5. Rearrange equations used to model a relationship to highlight a quantity of interest.**	FTL Unit 3 Lesson 8 FTL Unit 3 Lesson 9

	HSF.BF.A.1 HSF.IF.B.5 HSN.Q.A.1		6. Solve contextual problems and interpret solution in the context of a problem. 7. Identify quantities, relationships, and constraints in a modeling context. 8. Determine and name assumptions about quantities, and use these estimations in the modeling of a contextual situation. 9. Assign variables and write algebraic expressions to model parts of a contextual situation. 10. Use expressions to model quantities of interest and substitute values to determine a reasonable solution. 11. Organize work and solution so thinking is transparent. 12. Justify model and conclusion based on relationships and assumptions from the contextual situation	

Topic C: Properties and Solutions of Single-Variable Linear Inequalities

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Dec 6/ 7		BENCHMARK 2	COMPLETE BENCHMARK 2 WINDOW OPEN Dec 5-9	
Dec 8 / 9 Warm Up Z	MLS A1.CED.A.3 A1.REI.A.1 A1.CED.A.1 A1.SSE.A.3 CCSS HSA.CED.A.3 HSA.REI.A.1 HSA.REI.B.3 HSA.SSE.B.3	I can solve unbounded single-variable inequalities in contextual and non-contextual situations. I can write and graph compound single-variable inequalities to describe the solution to contextual and non-contextual situations.	1. Describe an inequality as a constraint on a situation. 2. Describe the maximum, the minimum, and some additional values that are solution sets of a one-variable inequality. 3. Write more than one inequality from a solution presented graphically on a number line, given particular constraints. 4. Solve a single-variable inequality using negative and positive rational number coefficients. 5. Describe why "flipping the inequality" is	FTL Unit 3 Lesson 10 FTL Unit 3 Lesson 11

			necessary when solving by a negative coefficient—through understanding testing points and identifying true and untrue statements. 6. Write an inequality that has both a minimum and a maximum value from a contextual situation. Identify this as a compound inequality. 7. Solve compound inequalities and identify the solutions as either inclusive, exclusive, or either a union or disjoint. 8. Use appropriate notation to algebraically write a compound OR inequality and appropriate notation to algebraically write a compound AND inequality (inclusive and exclusive). 9. Use appropriate notation to graphically show the solution set of a compound inequality (inclusive, exclusive, and, or). 10. Identify when an inequality is used inappropriately in either mathematical or contextual situations. 11. Describe why a compound inequality is necessary in contextual situations, and use x > 0 and y > 0 to denote positive solutions for a context.	
Dec 12 / 13 Warm Up AA	MLS A1.CED.A.3 A1.REI.A.1 A1.CED.A.1 CCSS HSA.CED.A.3 HSA.REI.A.1 HSA.REI.B.3	I can write and graph compound single-variable inequalities to describe the solution to contextual and non-contextual situations I can solve and graph compound inequalities where algebraic manipulation is necessary in contextual and non-contextual situations.	1. Write an inequality that has both a minimum and a maximum value from a contextual situation. Identify this as a compound inequality. 2. Solve compound inequalities and identify the solutions as either inclusive, exclusive, or either a union or disjoint. 3. Use appropriate notation to algebraically write a compound OR inequality and appropriate notation to algebraically write a compound AND inequality (inclusive and exclusive). 4. Use appropriate notation to graphically show the solution set of a compound inequality	FTL Unit 3 Lesson 11 FTL Unit 3 Lesson 12

			(inclusive, exclusive, and, or). 5. Identify when an inequality is used inappropriately in either mathematical or contextual situations. 6. Describe why a compound inequality is necessary in contextual situations, and use x > 0 and y > 0 to denote positive solutions for a context. 7. Separate compound "and" inequalities into two inequalities to add validity to the mechanics of solving a compound "and" inequality. 8. Use the mechanics of solving a compound inequality to identify the solution set to compound inequalities. 9. Graph compound inequalities and verify solutions through substitution into the original inequalities. 10. Write, solve, and graph contextual compound inequalities in need of algebraic manipulation.	
Dec 14		**Flex**		
Dec 15 / 16		**Unit 4 Assessment**	**Unit 4 Assessment in Mastery Connect (Paper Copy for students with accommodations/paper copy needs)**	

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Unit 5: Linear Equations, Inequalities, and Systems

Students become proficient at manipulating, identifying features, graphing, and modeling with two-variable linear equations and inequalities. Students formalize their understanding of linear systems of equations and inequalities to model and analyze contextual situations. Proficiency of algebraic manipulation and solving, graphing skills, and identification of features of functions are essential groundwork to build future concepts.

DEI Activity: Linear Equation Flag Project or use one of the real-world examples that catch the interest of students to teach systems.

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Jan 3 /4 **Warm Up BB**	**MLS** **A1.REI.C.6** **A1.SSE.A.3** **CCSS** **HSA.REI.D.10** **HSA.SSE.B.3**	**I can identify the solutions and features of a linear equation and when two linear equations have the same solutions.**	**1. Identify that the solutions to a line are only those that are on the graph of the line or can be substituted into a linear equation to produce a true statement.** **2. Show algebraically that a point is either on the graph of a line or not on the graph of a line.** **3. Manipulate a linear equation to show that it has the same solutions as an original equation.**	FTL Unit 4 Lesson 1
Jan 5 / 6 **Warm Up CC**	**MLS** **A1.IF.B.3** **A1.IF.C.7** **A1.SSE.A.3** **HSF.IF.B.4** **HSF.IF.C.7.a** **HSA.SSE.B.3**	**I can write linear equations given features, points, or graph in standard form, point-slope form, and slope-intercept form**	**1. Rearrange a linear equation to reveal the slope when an equation is given in standard form.** **2. Substitute zeros for the appropriate variable to find the intercepts of a linear function.** **3. Write a linear equation given features of the linear equation.** **4. Graph a linear equation from all three forms of linear equation.**	FTL Unit 4 Lesson 2
Jan 9-13 **Final Exam Week**			**Teachers create their own quiz or activity based on student need. This will not be reflected in district data as these standards will be assessed at the end of unit 5.**	
— End of Second Quarter —				

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Second Semester

Unit 5 (continued): Linear Equations, Inequalities, and Systems

Students become proficient at manipulating, identifying features, graphing, and modeling with two-variable linear equations and inequalities. Students formalize their understanding of linear systems of equations and inequalities to model and analyze contextual situations. Proficiency of algebraic manipulation and solving, graphing skills, and identification of features of functions are essential groundwork to build future concepts.

DEI Activity: Linear Equation Flag Project or use one of the real-world examples that catch the interest of students to teach systems.

Topic A: Properties and Solutions of Two-Variable Linear Equations

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Jan 17/18 **Warm Up DD**	**MLS** **A1.IF.B.5** **A1.IF.C.7** **A1.IF.C.9** **A1.LQE.A.1.a** **CCSS** **HSF.IF.B.6** **HSF.IF.C.7.a** **HSF.IF.C.9** **HSF.LE.A.1.a**	**Review:** **I can identify the solutions and features of a linear equation and when two linear equations have the same solutions.** **I can write linear equations given features, points, or graph in standard form, point-slope form, and slope-intercept form** **New Instruction:** **I can determine if a function is linear based on the rate of change of points in the function presented graphically and in a table of values.**	**Review** 1. **Identify that the solutions to a line are only those that are on the graph of the line or can be substituted into a linear equation to produce a true statement.** 2. **Show algebraically that a point is either on the graph of a line or not on the graph of a line.** 3. **Manipulate a linear equation to show that it has the same solutions as an original equation.** 4. **Rearrange a linear equation to reveal the slope when an equation is given in standard form.** 5. **Substitute zeros for the appropriate variable to find the intercepts of a linear function.** 6. **Write a linear equation given features of the linear equation.** 7. **Graph a linear equation from all three forms of linear equation.** **New Instruction:**	FTL Unit 4 Lesson 3

			1. **Given a table of values, identify the rate of change between two points.** 2. **Describe the difference between subsequent y-values, given equal intervals on the x-values.** 3. **Write an equation from a table of values.** 4. **Compare a table of values with a graph of a linear equation, and describe which has the larger rate of change.** 5. **Identify graphs that appear linear but based on the non-constant rate of change are not linear.**	

Topic B: Properties and Solutions of Two-Variable Linear Inequalities

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Jan 19/20 **Warm Up EE**	**MLS** **A1.REI.C.8** **A1.CED.A.1** **A1.REI.D.C.8** **CCSS** **HSA.REI.D.12** **HSA.CED.A.3** **HSA.REI.D.12**	**I can describe the solutions and features of a linear inequality.** **I can graph linear inequalities.** **I can write linear inequalities from graphs.**	1. **Given a linear equation, identify how the solution set will change when the equal sign is changed to a less than, less than or equal to, greater than, or greater than or equal to sign.** 2. **Match graphs of linear inequalities to algebraic representations of linear inequalities by testing points and analyzing the inequality.** 3. **Graph a linear inequality by identifying the features of the linear equation and then modifying the solution set to represent an inequality.** 4. **Identify features of linear inequalities from graphs and represent them algebraically.** 5. **Test points in a linear inequality and verify graphically.** 6. **Include domain and range restrictions in graphing and writing linear inequalities.**	FTL Unit 4 Lesson 6 FTL Unit 4 Lesson 7

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Jan 23/24 **Warm Up FF**	**MLS** **A1.CED.A.3** **A1.REI.C.8** **A1.CED.A.3** **CCSS** **HSA.CED.A.3** **HSA.REI.D.12** **HSA.CED.A.3**	**I can write linear inequalities from graphs.** **I can write linear inequalities from contextual situations.**	**1. Identify features of linear inequalities from graphs and represent them algebraically.** **2. Test points in a linear inequality and verify graphically.** **3. Include domain and range restrictions in graphing and writing linear inequalities.** **4. Identify features of linear inequalities from word problems and represent them algebraically.** **5. Describe linear inequalities as "constraints" in the problem. Describe how these inequalities restrict the possible solutions to the problem.** **6. Graph linear inequalities from contextual situations and describe solutions in the context of the problem.**	FTL Unit 4 Lesson 7 FTL Unit 4 Lesson 8

Topic C: System of Equations and Inequalities

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Jan 25/26 **Warm Up GG**	**MLS** **A1.CED.A.3** **A1.REI.C.6** **A1.REI.C.8** **CCSS** **HSA.CED.A.3** **HSA.REI.D.11** **HSA.REI.D.12**	**I can solve a system of linear equations graphically.** **I can identify solutions to systems of inequalities graphically.** **I can write systems of inequalities from graphs and word problems.**	**1. Describe that the solution to a system of equations is the intersection point of the lines in the graph or a point that satisfies all equations.** **2. Use the relationship between variables to write multiple functions that form a system of equations.** **3. Describe the solution to a system of equations in the context of the problem.** **4. Describe the similarities and differences between finding a solution to a system of equations and a system of inequalities.** **5. Describe why a system of inequalities is important in restricting the region that is the solution set.**	FTL Unit 4 Lesson 9 FTL Unit 4 Lesson 10

			6. Describe why a word problem that represents a solution to a system of linear inequalities has multiple solutions, not just one. 7. Identify the solution set to a system of linear inequalities shown graphically.	
Jan 27/30 Warm Up HH	MLS A1.CED.A.3 A1.NQ.B.4 A1.REI.B.5 A1.REI.B.3 CCSS HSA.CED.A.3 HSN.Q.A.2 HSA.REI.C.5 HSA.REI.C.6	I can solve linear systems of equations of two variables by substitution.	1. Identify the variables, relationship between the variables, and number of functions in system of equations problems. 2. Describe why solving by substitution works algebraically. 3. Describe the meaning of a solution to a system of linear equations in the context of a problem. 4. Describe any domain restrictions that are presented when a system is presented in a contextual situation. 5. Describe the equivalence of a solution found graphically and a solution found algebraically.	FTL Unit 4 Lesson 11
Jan 31/Feb 1 Warm Up II	MLS A1.REI.B.3 CCSS HSA.REI.C.5	I can identify solutions to systems of equations algebraically using elimination. I can write systems of equations.	1. Describe how solving a system by elimination is different than solving a system by substitution. Explain that the solutions will be the same regardless of method. 2. Describe that when you multiply an equation through by a factor, the result is an equivalent equation. 3. Identify alternative methods, within the elimination strategy, to solve a system of equations. 4. Explain how you know that the solution to two systems will be the same because of the structure of the two systems.	FTL Unit 4 Lesson 12

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Feb 2/3 **Warm Up JJ**	**MLS** **A1.REI.A.1** **A1.REI.B.3** **A1.SSE.A.3** **CCSS** **HSA.REI.A.1** **HSA.REI.C.6** **HSA.SSE.B.3**	**I can identify solutions to systems of equations using any method.** **I can write a system of equations and inequalities.**	1. **Choose an efficient method to solve systems of equations or inequalities.** 2. **Identify substitution as an efficient strategy when one variable has a coefficient of 1.** 3. **Identify elimination as an efficient strategy when no variables have a coefficient of 1 and no equations are easily solvable for one variable.** 4. **Identify graphing as an efficient strategy when there is more analysis that needs to be done of the situation and a graph would be helpful with this.** 5. **Explain that, regardless of method, the solution to the system will be the same.**	FTL Unit 4 Lesson 13
Feb 6/7		**Flex Day**		
Feb 8/9		**Unit 5 Assessment**	**Unit 5 Assessment in Mastery Connect (Paper Copy for students with accommodations/paper copy needs)**	

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Unit 6: Exponents and Exponential Functions

Students review exponent rules studied in middle school and extend their understanding of exponents. In this unit, students will be operating with polynomials as an extension of work done in Unit 3 with expressions, and utilizing exponent rules reviewed in this unit. Students formalize the conceptual understanding of the power of exponents to increase or decrease values at increasing or decreasing rates, respectively, to model with exponential functions. Students use the understanding about linear functions developed in earlier units to make comparisons to exponential situations in terms of algebraic modeling, use of the function in contextual situations, and graphical analysis. The understanding from this unit carries through to quadratics as well as into Algebra 2 with exponential modeling and logarithms.

DEI Activity: Use the given link to analyze graphs and facilitate conversations about current event situations that would be modeled similarly.

Topic A: Exponent Rules, Expressions, and Radicals

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Feb 10/13 **Warm Up KK**	**MLS** **8.EEI.A.1** **A1.SSE.A.2.** **CCSS** **8.EEI.A.1** **HSA.SSE.A.2**	**I can use exponent rules to analyze and rewrite expressions with non-negative exponents.** **I can use negative exponent rules to analyze and rewrite exponential expressions.**	**1. Use the power, product, and quotient rules to simplify exponential expressions with non-negative exponents.** **2. Use the order of operations and properties of exponents to write equivalent expressions and to justify why two expressions are not equivalent.** **3. Understand the property of negative exponents.** **4. Use properties of exponents to simplify expressions including negative and zero exponents.** **5. Analyze the structure of an exponential expression and determine an efficient way to write a simplified equivalent expression (Standard for Mathematical Practice 7).**	**FTL Unit 6 Lesson 1** **FTL Unit 6 Lesson 5**
Feb 14/15 **Warm Up LL**	**MLS** **A1.APR.A.1** **8.EEI.A.1** **CCSS**	**I can add and subtract polynomial expressions using properties of operations.**	**1. Understand a polynomial as a sum of terms in which each term includes only multiplication as an operator.** **2. Identify the degree and leading coefficient for polynomials.**	FTL Unit 6 Lesson 2 FTL Unit 6 Lesson 4

	HSA.APR.A.1 **8.EE.A.1**	**I can solve mathematical applications of exponential expressions.**	**3. Find the sum or difference of polynomials using the properties of operations and write polynomials in standard form.** **4. Use the properties of exponents in area and volume problems.** **5. Simplify expressions using the properties of exponents.** **6. Change the base of exponential expressions to write equivalent expressions.**	
Feb 16/17 **Warm Up MM**	**MLS** **A1.A1.APR.A.1** **8.EEI.A.1** **CCSS** **HSA.APR.A.1** **8.EE.A.1**	**I can multiply polynomials using properties of exponents and properties of operations.** **I can solve mathematical applications of exponential expressions.**	**1. Apply the distributive property to multiply a monomial by a polynomial.** **2. Apply the distributive property more than once to multiply a polynomial by a polynomial.** **3. Use precision when simplifying polynomial expressions; multiply coefficients of terms and add the exponents of like bases (Standard for Mathematical Practice 6).** **4. Use the properties of exponents in area and volume problems.** **5. Simplify expressions using the properties of exponents.** **6. Change the base of exponential expressions to write equivalent expressions.**	FTL Unit 6 Lesson 3 FTL Unit 6 Lesson 4

Topic B: Arithmetic and Geometric Sequences

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Feb 21/22 **Warm Up NN**	**MLS** **A1.LQE.B.4** **A1.IF.A.2** **A1.LQE.B.5**	**I can describe and analyze sequences given their recursive formulas.**	**1. Define sequences as a set of elements ordered in a way that they are labeled with consecutive positive integers starting with 1** **2. Understand sequences as functions.**	FTL Unit 6 Lesson 11 FTL Unit 6 Lesson 12

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	CCSS HSF.BF.A.2 HSF.IF.A.2 HSF.IF.A.3	I can write recursive formulas for sequences, including the Fibonacci sequence.	3. Describe features of sequences given their recursive formula, written in sequence notation and in function notation. 4. Evaluate sequences using their recursive formula. 5. Use precise language to describe terms in sequences, in both sequence notation and in function notation. 6. Understand there are two ways to write a formula for a sequence: recursively and explicitly. 7. Define the Fibonacci sequence and represent it recursively. 8. Represent a sequence with a recursive formula, identifying the relationship between terms and defining the value of the first term. 9. Write a sequence given an explicit formula.	
Feb 23/24 Warm Up OO	**MLS** A1.LQE.B.4 A1.LQE.A.3 **CCSS** HSF.BF.A.2 HSF.LE.A.2	I can define arithmetic and geometric sequences, and identify common ratios and common differences in sequences.	1. Define arithmetic sequences as those that increase or decrease linearly and have a common difference (constant average rate of change) between terms. 2. Define geometric sequences as those that increase or decrease exponentially and have a common ratio (increasing/decreasing average rate of change) between terms. 3. Identify the common difference or common ratio for arithmetic and geometric sequences, respectively. 4. Write recursive formulas for arithmetic and geometric sequences.	FTL Unit 6 Lesson 13
Feb 27/28 Warm Up PP	**MLS** A1.LQE.B.4 A1.LQE.B.5	I can write explicit rules for arithmetic sequences and	1. Understand the difference between an explicit formula and recursive formula; understand that an explicit formula can	FTL Unit 6 Lesson 14

	A1.LQE.A.3 CCSS HSF.BF.A.2 HSF.IF.A.3 HSF.LE.A.2	translate between explicit and recursive formulas.	generate a value of any term, without needing to know an existing term in the sequence. 2. Write explicit rules for arithmetic sequences and use them to find specific terms in the sequence. 3. Write recursive formulas for arithmetic sequences given an explicit formula, and vice versa.	
Mar 1/2 Warm Up QQ	MLS A1.LQE.B.4 A1.LQE.B.5 A1.LQE.A.3 CCSS HSF.BF.A.2 HSF.IF.A.3 HSF.LE.A.2	I can write explicit rules for geometric sequences and translate between explicit and recursive formulas.	1. Write explicit rules for geometric sequences and use them to find specific terms in the sequence. 2. Write recursive formulas for geometric sequences given an explicit formula, and vice versa. 3. Understand that the graph of a geometric sequence, written as a function, is an exponential function.	FTL Unit 6 Lesson 15

Topic C: Exponential Growth and Decay

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Mar 3/6 Warm Up RR	MLS A1.IF.C.9 A1.LQE.A.1 A1.LQE.A.3 A1.IF.B.6 A1.SSE.A.1 CCSS HSF.IF.C.9 HSF.LE.A.1 HSF.LE.A.2 HSF.LE.A.3 HSF.LE.B.5	I can compare rates of change in linear and exponential functions shown as equations, graphs, and situations. I can write linear and exponential models for real-world and mathematical problems.	1. Understand that linear functions have a constant rate of change and exponential functions have an increasing or decreasing rate of change. 2. Identify whether functions are linear or exponential in graphs, tables, equations, and situations. 3. Compare linear and exponential functions, identifying where the rates of change of exponential functions are greater than or less than linear functions.	FTL Unit 6 Lesson 16 FTL Unit 6 Lesson 17

	HSA.SSE.A.1		4. Understand that an increasing exponential function will eventually exceed an increasing linear function. 5. Identify features of linear and exponential functions in contextual situations. 6. Write linear and exponential functions for real-world situations. 7. Write linear and exponential functions from two input-output pairs.	
Mar 7/8 Warm Up SS	MLS A1.BF.A.1 A1.IF.C.7 A1.IF.C.8 A1.LQE.A.1 A1.LQE.A.3 A1.IF.C.8 CCSS HSF.BF.B.3 HSF.IF.C.7.E HSF.IF.C.8.B HSF.LE.A.1 HSF.LE.A.2 HSF.LE.B.5	I can graph exponential growth functions and write exponential growth functions from graphs. I can write exponential growth functions to model financial applications, including compound interest. I can solve exponential growth problems.	1. Analyze an exponential growth function in equation form to identify features in the graph of the function including the y-intercept, domain, range, rate of change, etc. 2. Analyze the graph of an exponential growth function to write an equation for the function. 3. Transform the graph of the parent function $f(x)=a^x$ 4. Identify the percent change in exponential growth functions. 5. Understand the difference between simple interest (linear growth) and compound interest (exponential growth). 6. Understand that where compounding happens more frequently, the growth rate will be higher. 7. Write and evaluate exponential functions for compound interest situations and compare to simple interest situations. 8. Identify when a situation has a constant rate of change, an increasing rate of change, or a decreasing rate of change. 9. Write exponential growth for real-world situations.	FTL Unit 6 Lesson 18 FTL Unit 6 Lesson 19 FTL Unit 6 Lesson 22

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			10. Interpret exponential functions in context of their situations.	
Mar 9/10 Warm Up TT	MLS A1.IF.C.8 A1.LQE.A.1 CCSS HSF.IF.C.8.b HSF.LE.A.1	I can write, graph, and evaluate exponential decay functions. I can Identify features of exponential decay in real-world problems. I can solve exponential decay problems.	1. Understand that an exponential decay function has a decreasing rate of change, represented by a value between 0 and 1, compared to an exponential growth function that has an increasing rate of change. 2. Identify exponential decay functions in equations, tables, and graphs. 3. Analyze an exponential decay function in equation form to identify features in the graph of the function including the y-intercept, domain, range, rate of change, etc. 4. Analyze the graph of an exponential decay function to write an equation for the function. 5. Determine if a real-world situation is exponential growth or exponential decay. 6. Identify the rate of decay in a real-world situation. 7. Write and evaluate exponential decay functions for applications. 8. Identify when a situation has a constant rate of change, an increasing rate of change, or a decreasing rate of change. 9. Write exponential growth for real-world situations. 10. Interpret exponential functions in context of their situations.	FTL Unit 6 Lesson 20 FTL Unit 6 Lesson 21 FTL Unit 6 Lesson 22
Mar 13/14		Flex Day		

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Mar 15/16		**Flex Day**		
Mar 20/21		**Unit 6 Assessment**	**Unit 6 Assessment in Mastery Connect (Paper Copy for students with accommodations/paper copy needs)**	
Mar 22/23		**BENCHMARK 3**	**COMPLETE BENCHMARK 3 WINDOW OPEN March 20-23**	
Mar 27- Mar 31		**SPRING BREAK**		

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Unit 7: Quadratic Functions and Solutions

Students begin a deep study of quadratic functions. Students pull together their understanding of graphical analysis, algebraic manipulation, and linear equations and inequalities to develop an understanding of what a solution means in context, graphically, and algebraically within quadratics. The concepts learned in this unit will be directly applied throughout Algebra 2, where students will be expected to be fluent in analyzing and solving quadratic functions and equations. Students dive deep into all forms of quadratic equations, methods to solve quadratic equations, and methods to identify features from equations. Students apply their understanding of how to graphically and algebraically analyze, manipulate, and solve quadratic functions to model contextual situations.

DEI Activity: Watch the video with your students. Discuss the functions represented in the video. Have students find monuments and situations around the world that represent a quadratic function.

Topic A: Features of Quadratic Functions

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Apr 3 / 4 **Warm Up UU**	**MLS** **A1.IF.B.3** **A1.LQE.A.2** **A1.IF.C.7** **CCSS** **HSF.IF.B.4** **HSF.LE.A.2** **HSF.IF.C.7.A**	**I can compare quadratic, exponential, and linear functions represented as graphs, tables, and equations.** **I can identify key features of a quadratic function represented graphically.**	1. **Distinguish between linear, exponential, and quadratic functions in tables, equations, and graphs.** 2. **Describe features of quadratic functions represented in graphs.** 3. **Describe features of quadratic functions represented in equations.** 4. **Describe features of quadratic functions represented in tables, including constant second differences.** 5. **Use vocabulary to describe the features of graphs of parabolas, including maximum, minimum, line of symmetry, y−intercept, roots/solutions/x−intercepts, facing up/down, domain and range.** 6. **Annotate parabolas with features.**	FTL Unit 7 Lesson 1 FTL Unit 7 Lesson 2
Apr 5 / 6 **Warm Up VV**	**MLS** **A1.IF.B.3** **A1.IF.B.5** **A1.IF.C.7**	**I can graph a quadratic function from a table of values.**	1. **Sketch a graph of a quadratic function given particular features.** 2. **Graph a quadratic function using a table of values.**	FTL Unit 7 Lesson 2 FTL Unit 7 Lesson 3

	CCSS **HSF.IF.B.4** **HSF.IF.B.6** **HSF.IF.C.7.a**	**I can calculate and compare the average rate of change for linear, exponential, and quadratic functions.**	**3. Compare the average rate of change between a linear function, exponential function, and quadratic function over specific intervals.** **4. Describe intervals of a quadratic function where the average rate of change is increasing, decreasing, or zero.** **5. Understand that the average rate of change of a quadratic function will eventually exceed that of a linear function but will not eventually exceed that of an exponential function.**	

Topic B: Factoring and Solutions of Quadratic Equations

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Apr 11 / 12 **Warm Up WW**	**MLS** **A1.APR.A.1** **A1.SSE.A.2** **A1.SSE.A.3** **CCSS** **HSA.APR.A.1** **HSA.SSE.A.2** **HSA.SSE.B.3.a**	**I can factor quadratic expressions using the greatest common factor.** **I can demonstrate equivalence between expressions by multiplying polynomials.** **I can factor by grouping.**	**1. Identify a greatest common factor in a quadratic expression and rewrite the expression as a product of the greatest common factor and a polynomial.** **2. Multiply a monomial by a polynomial and multiply two binomials.** **3. Determine if two polynomials are equivalent.** **4. Identify quadratic expressions in standard form.**	FTL Unit 7 Lesson 4
Apr 13 / 14 **Warm Up XX**	**MLS** **A1.SSE.A.1** **A1.SSE.A.3** **CCSS** **HSA.SSE.A.1.a** **HSA.SSE.B.3.a**	**I can factor quadratic equations and identify solutions (when leading coefficient = 1).** **I can factor quadratic equations and identify solutions (when leading coefficient does not equal 1).**	**1. Understand factoring as the reverse process of multiplying.** **2. Understand the value of factoring a quadratic equation in revealing the solutions of the equation.** **3. Distinguish between quadratic, linear, and constant terms in a quadratic expression and use them to factor efficiently.**	FTL Unit 7 Lesson 6 FTL Unit 7 Lesson 7

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			4. Factor, where possible, quadratic equations with leading coefficients equal to 1. 5. Determine an efficient process to factor quadratic equations and to rewrite quadratic trinomials as a product of two linear binomials. 6. Solve quadratic equations by factoring.	
Apr 17 / 18 Warm Up YY	MLS A1.SSE.A.1 A1.SSE.A.2 A1.SSE.A.3 CCSS HSA.SSE.A.1.a HSA.SSE.A.2 HSA.SSE.B.3.a	I can use the quadratic formula to find the roots of a quadratic function. I can factor special cases of quadratic equations - difference of two squares. I can review all types of factoring.	1. Identify features of two linear binomials that when multiplied together result in a quadratic binomial difference of two squares. 2. Factor and solve quadratic equations that represent a difference of two squares. 3. Describe graphical features of quadratic functions that are differences of two squares. 4. Use the quadratic formula to determine the roots of a quadratic equation.	FTL Unit 7 Lesson 8 FTL Unit 8 Lesson 6
Apr 19 /20 Warm Up ZZ	MLS A1.SSE.A.3 A1.IF.C.8 A1.IF.C.9 A1.SSE.B.3 CCSS HSA.APR.B.3 HSF.IF.C.8.a HSF.IF.C.9 HSA.SSE.B.3.a	I can identify solutions to quadratic equations using the zero product property (equations written in intercept form). I can solve quadratic equations by factoring. I can compare solutions in different representations (graph, equation, and table).	1. Describe the zero product property: in order for a product to be zero, at least one of the factors must be zero. 2. Understand the solutions to a quadratic equation as the roots of the function or the x-intercepts of the graph. 3. Use the zero product property to determine the solutions of a quadratic equation when written in intercept form. 4. Identify roots of a quadratic equation from an equation, graph, and table of values. 5. Use efficient methods to factor quadratic equations to reveal roots.	FTL Unit 7 Lesson 5 FTL Unit 7 Lesson 10

			6. **Compare solutions to quadratic equations shown in different ways.**	

Topic C: Transformations and applications

Dates	MLS/CCSS	Learning Targets	Success Criteria	Activities
Apr 21 / 24 Warm Up AAA	**MLS** **A1.CED.A.1** **A1.IF.B.3** **A1.IF.B.5** **A1.IF.C.8** **A1.SSE.B.3** **CCSS** **HSA.CED.A.1** **HSF.IF.B.4** **HSF.IF.B.5** **HSF.IF.C.8** **HSA.SSE.B.3**	**I can describe features of the vertex form of a quadratic function and write quadratic equations in vertex form from graphs.** **I can solve and interpret quadratic applications using the vertex form of the equation.** **I can interpret quadratic solutions in context.**	1. **Identify the vertex from an equation written in vertex form, f(x)=a(x−h)2+k, where the vertex is (h,k).** 2. **Describe the features that different forms of quadratic equations reveal about the graph of the function.** 3. **Write the equation for a quadratic function given as a graph or a function described verbally; use the most appropriate form of the equation.** 4. **Interpret features of quadratic functions in context of the situation (for example, roots represent “break-even” values in profit models).** 5. **Understand that quadratic equations can be used to represent profit functions (the amount of money a business makes on the sale of a product).** 6. **Describe in context what it means to be a solution to a quadratic function.** 7. **Interpret points in a situation from a table of values and a graph.** 8. **Describe other features of the quadratic function including vertex, intercepts, and symmetry in context of the situation.** 9. **Identify and describe domain restrictions in the context of situations.** 10. **Create quadratic equations in one variable for geometric applications and interpret solutions in geometric context.**	FTL Unit 8 Lesson 1 FTL Unit 8 Lesson 4 FTL Unit 7 Lesson 13

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Apr 25 / 26 **Warm Up BBB**	**MLS** **A1.BF.A.1** **A1.CED.A.2** **A1.IF.C.8** **A1.IF.C.9** **A1.LQE.A.3** **CCSS** **HSF.BF.B.3** **HSA.CED.A.2** **HSF.IF.C.8.a** **HSF.IF.C.9** **HSF.BF.A.1.b**	**I can describe transformations to quadratic functions.** **I can write equations for transformed quadratic functions.** **I can graph and describe transformations to quadratic functions in mathematical and real-world situations.**	1. **Describe transformations to quadratic functions as seen in graphs and equations.** 2. **Identify transformations as they are presented in the equations of quadratic functions.** 3. **Write equations to represent the transformation of quadratic graphs as seen in graphs and as described verbally.** 4. **Graph transformations to quadratic functions from equations and descriptions.** 5. **Analyze parabolas in real-world contexts and use transformations to make adjustments to the parabola.** 6. **Describe how features of a quadratic function relate to a real-world context involving projectile motion.** 7. **Compare two projectile motion situations.** 8. **Describe how features of a quadratic function relate to a geometric context involving area.** 9. **Write quadratic functions to represent area of geometric figures.** 10. **Solve quadratic equations that model area problems and interpret the solutions in context, including determining maximum and minimum measurements.** 11. **Describe how features of a quadratic function relate to revenue applications.** 12. **Understand revenue as the product of the cost of an item and the number of items sold.** 13. **Write quadratic functions to represent revenue models, where a change in price results in a change in quantity of item sold.**	FTL Unit 8 Lesson 9 FTL Unit 8 Lesson 10 FTL Unit 8 Lesson 11 FTL Unit 8 Lesson 12 FTL Unit 8 Lesson 13

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			14. Solve quadratic equations that model revenue problems and interpret the solutions in context.	
Apr 27 / 28 Warm Up CCC	MLS A1.REI.B.4 A1.REI.C.6 CCSS HSA.REI.C.7 HSA.REI.D.11	I can solve and identify solutions to systems of quadratic and linear equations when two solutions are present. I can solve and identify solutions to systems of quadratic and linear equations when two, one, or no solutions are present.	1. Understand the solution to a system is the point(s) of intersection of the graphs of the equations in the system. 2. Distinguish between the solutions to a quadratic equation (where the parabola crosses the x−axis) and the solutions to a system that includes a quadratic equation (where the graphs of the two equations intersect). 3. Identify the solutions to a system that includes a quadratic and linear equation from a graph. 4. Determine the solutions to a system algebraically, where one of the equations in the system is quadratic and the other is linear. 5. Understand that a system of linear and quadratic equations can have two, one, or no solutions; identify graphically examples of each case. 6. Interpret the algebraic solution of a system of linear and quadratic equations as representing two, one, or no solutions. 7. Solve real-world applications of systems of linear and quadratic equations.	FTL Unit 8 Lesson 14 FTL Unit 8 Lesson 15
May 1 / 2		Flex Day		
May 3 / 4		Unit 7 Assessment	Unit 7 Assessment in Mastery Connect (Paper Copy for students with accommodations/paper copy needs)	

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