

ALGEBRA, FUNCTIONS, AND DATA ANALYSIS PACING GUIDE (Created 2014)

Amherst County Public Schools

Introduction

The 2009 Mathematics Standards of Learning Curriculum Framework is a companion document to the 2009 Mathematics Standards of Learning and amplifies the Mathematics Standards of Learning by defining the content knowledge, skills, and understandings that are measured by the Standards of Learning assessments. The Curriculum Framework provides additional guidance to school divisions and their teachers as they develop an instructional program appropriate for their students. It assists teachers in their lesson planning by identifying essential understandings, defining essential content knowledge, and describing the intellectual skills students need to use. This supplemental framework delineates in greater specificity the content that all teachers should teach and all students should learn.

Each topic in the Mathematics Standards of Learning Curriculum Framework is developed around the Standards of Learning. The format of the Curriculum Framework facilitates teacher planning by identifying the key concepts, knowledge and skills that should be the focus of instruction for each standard. The Curriculum Framework is divided into two columns: Essential Understandings and Essential Knowledge and Skills. The purpose of each column is explained below.

Essential Understandings and Questions

This section delineates the key concepts, ideas and mathematical relationships that all students should grasp to demonstrate an understanding of the Standards of Learning.

Essential Knowledge and Skills

Each standard is expanded in the Essential Knowledge and Skills column. What each student should know and be able to do in each standard is outlined. This is not meant to be an exhaustive list nor a list that limits what is taught in the classroom. It is meant to be the key knowledge and skills that define the standard.

The Curriculum Framework serves as a guide for Standards of Learning assessment development. Assessment items may not and should not be a verbatim reflection of the information presented in the Curriculum Framework. Students are expected to continue to apply knowledge and skills from Standards of Learning presented in previous grades as they build mathematical expertise.

Textbook Overview

Course Text: Algebra, Functions, and Data Analysis: A Virginia Course

Supplemental Materials: Teacher's Resource Guide and Printed Test Bank, TestGen Testmaker, www.MathXLforSchool.com website

Publisher: Pearson Custom Publishing

Algebra, Functions, and Data Analysis

Suggested Sequence of Instruction and Pacing

First Nine Weeks

SOL	Chapter/Sections/Topic	Time Frame (Tentative)
Algebra 1 Review	Review Algebra 1 SOLs for retesters	15 days (included in the 24 days for Chapter 1)
AFDA. 1, 2, 4	Chapter 1: Introduction to Problem Solving and Mathematical Models; Section 1 - 14	24 Days
AFDA. 1, 2, 4	Chapter 2: Linear Function Models and Problem Solving; Sections 1 - 6	14 Days
	Review and Nine Weeks Benchmark	7 Days
First Nine Weeks Total		45 Days

Second Nine

SOL	Chapter/Sections/Topic	Time Frame (Tentative)
AFDA. 1, 3, 4, 8	Chapter 2: Linear Function Models and Problem Solving; Sections 7 - 10	9 Days
AFDA. 3	Chapter 3: System of Linear Equations and Inequalities; Sections 1 - 7	16 Days
AFDA. 1, 2, 4	Chapter 4: Problem Solving with Quadratic and Variation Function Models; Sections 1 - 4	13 Days
	Review and Nine Weeks Benchmark	7 Days

Second Nine Weeks Total	45 Days
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Algebra, Functions, and Data Analysis

Third Nine Weeks

SOL	Chapter/Sections/Topic	Time Frame (Tentative)
AFDA. 1, 2, 3	Chapter 4: Problem Solving with Quadratic and Variation Function Models; Sections 5 - 11	14 Days
AFDA. 1, 2, 3, 4 New AFDA.3 – Delete Generate and use a best fit logarithmic equation	Chapter 5: Modeling with Exponential and Logarithmic Function; Sections 1 - 12	20 Days
AFDA. 1, 2, 4	Chapter 6: Probability Models; Sections 1 - 2, 6	4 Days
	Review and Nine Weeks Benchmark	7 Days
Third Nine Weeks Total		45 Days

Fourth Nine Weeks

SOL	Chapter/Sections/Topic	Time Frame (Tentative)
AFDA. 6	Chapter 6: Probability Models; Sections 3 - 5, 7	14 Days
AFDA. 7, 8	Chapter 7: Problem Solving with Graphical and Statistical Methods Sections 1 - 12	24 Days

	Review and Nine Weeks Benchmark	7 Days
Fourth Nine Weeks Total		45 Days

Algebra, Functions, and Data Analysis

First Nine Weeks Instruction

SOL/Essential Knowledge and Skills	Textbook/Chapter and Section	Resources	Key Questions	Vocabulary
	1.1: Wild About Harry 1.2: The Classroom	Student Extra Practice Workbook: p. 1	How can you organize information to solve mathematical problems? How can you help develop problem solving skills?	Arithmetic Sequence Geometric Sequence Fibonacci Sequence Inductive Reasoning Deductive Reasoning
	1.3: Make Me an Offer	Student Extra Practice Workbook: p. 2	What are key terms in translating verbal statements into algebraic equations and vice versa? How do you use formulas to solve problems?	Formula
	1.4: Proportional Reasoning	Student Extra Practice Workbook: p. 3	What is proportional reasoning? How do you know when to use proportions when solving problems?	Ratio Cross Multiplication Proportion Percent Equivalent Proportional Reasoning

	1.5: Fuel Economy	Student Extra Practice Workbook: p. 5	What is unit analysis?	Rate Unit Analysis Direct Method Proportion Method
<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics. (f) intervals in which the function is increasing/decreasing</p> <p>AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	1.6: Hot in Texas	Student Extra Practice Workbook: p. 5	<p>What are input and output variables?</p> <p>How do you identify independent and dependent variables?</p> <p>What is a functional relationship?</p> <p>How can you identify trends in data?</p>	<p>Variable Function Input Output Independent Dependent Ordered Pairs Numerically Defined Function Rectangular Coordinate System Quadrants Increasing Decreasing Constant</p>
<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics. (c) domain and range</p> <p>AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	1.7: Fill'er Up	Student Extra Practice Workbook: p. 6	<p>What is domain and range?</p> <p>How do you identify independent and dependent variables?</p>	<p>Rational Number Irrational Number Independent Variable Dependent Variable Domain Practical Domain Range Practical Range Increment Function Notation</p>

<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics.</p> <p>AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>1.8: Mathematical Modeling</p>		<p>How can you identify patterns between two variables using tables and models?</p> <p>What is a mathematical model?</p>	<p>Mathematical Model Mathematical Modeling</p>
<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics.</p> <p>(a) continuity NEW AFDA.1a – Delete Continuity</p> <p>AFDA. 4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>1.9: Fund-Raiser Revisited</p>	<p>Student Extra Practice Workbook: p. 7</p>	<p>How can you solve equations numerically and graphically?</p> <p>What is a solution for an equation?</p>	<p>Evaluated Equation Numerical Method Graphical Method Solution Continuous Discontinuity</p>

<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics.</p> <p>AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>1.10: Leasing a Copier</p>		<p>How can you develop mathematical models in the form of an equation?</p>	<p>Inverse Operations</p>
<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics.</p> <p>AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>1.11: Comparing Energy Costs</p>	<p>Student Extra Practice Workbook: p. 8</p>	<p>What are the steps in solving equations with variables on both sides?</p> <p>How do you identify when to use the distributive property and combine like terms?</p>	
<p>AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>1.12: Summer Job Opportunities</p>		<p>How can we use problem-solving skills to make decisions when given mathematical models?</p>	

prediction.				
<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics. (b) local and absolute maxima and minima AFDA.1b – [Moved to AFDA.1c] (f) intervals in which the function is increasing/decreasing AFDA. 4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	1.13: Graphs Tell Stories	Student Extra Practice Workbook: p. 9	<p>Write in words what a graph and its characteristics say about a situation?</p> <p>How can you sketch a graph when given a situation?</p> <p>What does it mean when a graph is increasing, decreasing, or constant?</p> <p>What are minimum and maximum points on a graph?</p> <p>When do we use the vertical line test?</p>	<p>Maximum Point Local Maximum Value Minimum Point Local Minimum Value Vertical Line Test</p>
<p>AFDA.2 The student will use knowledge of transformations to write an equation given the graph of a function (linear, quadratic exponential, and logarithmic.)</p>	1.14: Heating Schedule	Student Extra Practice Workbook: p. 10	<p>What are vertical and horizontal shifts?</p> <p>How can you identify vertical and horizontal shifts algebraically and graphically?</p>	<p>Vertical Shift Horizontal Shift Translation</p>
	2.1: How Fast did You Lose?	Student Extra Practice Workbook: p. 11	<p>What is the average rate of change?</p>	<p>Scatterplot Average Rate of Change Delta Notation</p>

<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics. (f) intervals in which the function is increasing/decreasing</p>	<p>2.2: The Snowy Tree Cricket</p>	<p>Student Extra Practice Workbook: p. 12</p>	<p>How is slope related to rate of change? How can you recognize a function is increasing or decreasing? How do you recognize the slopes of a horizontal and vertical line?</p>	<p>Linear Function Slope Increasing Function Decreasing Function Horizontal Line Vertical Line</p>
<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics. (d) zeros (e) intercepts AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>2.3: Depreciation</p>	<p>Student Extra Practice Workbook: p. 13</p>	<p>How can you determine x and y intercepts from a graph? What are applications for x and y intercepts? How do you find the zeros of a function? How do you write the equation of a line from a graph?</p>	<p>Vertical Intercept Y-Intercept Slope-Intercept Form Horizontal Intercept X-Intercept Positive Slope Negative Slope</p>
<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics. (e) intercepts AFDA.2 The student will use knowledge of transformations to write an equation given the graph of a function (linear, quadratic exponential, and logarithmic.)</p>	<p>2.4: Family of Functions</p>	<p>Student Extra Practice Workbook: p. 14</p>	<p>What are the affects of a vertical and horizontal shift for its equation and graph? What are the affects of vertical stretch and shrink for its equation and graph? What is a stretch factor?</p>	<p>Vertical Shift Horizontal Shift Reflection Stretch Factor Vertical Stretch Vertical Shrink Transfomations</p>

<p>AFDA.1 The student will investigate and analyze function families and their characteristics. (d) intercepts AFDA.3 The student will collect data and generate an equation for the curve of best fit to model real-world problems or applications. Students will use the best fit equation to interpolate function values, make decisions, and justify conclusions with algebraic and/or graphical models. AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>2.5: Predicting Population</p>	<p>Student Extra Practice Workbook: p. 15</p>	<p>What is the difference among observed, expected, and relative error? How can you apply slope and y-intercept in real-life applications?</p>	<p>Error Observed Value Expected Value Relative Error</p>
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<p>AFDA.1 The student will investigate and analyze function families and their characteristics. (d) intercepts AFDA.3 The student will collect data and generate an equation for the curve of best fit to model real-world problems or applications. Students will use the best fit equation to interpolate function values, make decisions, and justify conclusions with algebraic and/or graphical models. AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>2.6: Housing Prices</p>	<p>Student Extra Practice Workbook: p. 16</p>	<p>How do you write the equation of a line when given two points on the line? What is point-slope form of a line?</p>	<p>Point - Slope Form</p>
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Second Nine Weeks Instruction

SOL/Essential Knowledge and Skills	Textbook/Chapter and Section	Resources	Key Questions	Vocabulary
<p>AFDA.2 The student will use knowledge of transformations to write an equation given the graph of a function (linear, quadratic exponential, and logarithmic.)</p> <p>AFDA.3 The student will collect data and generate an equation for the curve (linear, quadratic, exponential, and logarithmic) of best fit to model real-world problems or applications. Students will use the best fit equation to interpolate function values, make decisions, and justify conclusions with algebraic and/or graphical models.</p>	2.7: Body Fat Percentage	Student Extra Practice Workbook: p. 17 - 18	<p>What is a scatterplot?</p> <p>How does an outlier affect a set of data?</p> <p>How can you estimate a line of best fit?</p> <p>What is a correlation coefficient?</p>	<p>Scatterplot</p> <p>Outlier</p> <p>Residuals</p> <p>Least Squares Regression Line</p> <p>Linear Correlation Coefficient</p> <p>Lurking Variable</p>
<p>AFDA.3 The student will collect data and generate an equation for the curve (linear, quadratic, exponential, and logarithmic) of best fit to model real-world problems or applications. Students will use the best fit equation to interpolate function values, make decisions, and justify conclusions with algebraic and/or graphical models.</p>	2.8: Plot Before Calculating	Student Extra Practice Workbook: p. 17 - 18	<p>What are the appropriate steps when finding the correlation coefficient and the regression line?</p>	

<p>AFDA.3 The student will collect data and generate an equation for the curve (linear, quadratic, exponential, and logarithmic) of best fit to model real-world problems or applications. Students will use the best fit equation to interpolate function values, make decisions, and justify conclusions with algebraic and/or graphical models.</p>	<p>2.9: College Tuition</p>	<p>Student Extra Practice Workbook: p. 17 - 18</p>	<p>How do you graphically find the regression line? What does the regression line tell you about the data?</p>	
<p>AFDA.3 The student will collect data and generate an equation for the curve (linear, quadratic, exponential, and logarithmic) of best fit to model real-world problems or applications. Students will use the best fit equation to interpolate function values, make decisions, and justify conclusions with algebraic and/or graphical models.</p>	<p>2.10: Body Parts</p>	<p>Student Extra Practice Workbook: p. 17 - 18</p>	<p>What patterns are developed in data?</p>	
<p>AFDA.5 The student will determine optimal values in problem situations by identifying constraints and using linear programming techniques.</p>	<p>3.1: Business Checking Account</p>	<p>Student Extra Practice Workbook: p. 21 - 22</p>	<p>What methods can be used to solve a system of linear equations? How are the methods of solving systems of linear equations related?</p>	<p>System of Linear Equations Numerical Method Graphical Method Substitution Method Consistent Inconsistent</p>
<p>AFDA.5 The student will determine optimal values in problem situations by identifying constraints and using linear programming techniques.</p>	<p>3.2: Modeling a Business</p>	<p>Student Extra Practice Workbook: p. 21 - 22</p>	<p>What is a breakeven point? What do intercepts mean in real-life situations?</p>	
<p>AFDA.5 The student will determine optimal values in problem situations by identifying constraints and using linear</p>	<p>3.3: Healthy Lifestyles</p>	<p>Students Extra Practice Workbook: p. 23 - 24</p>	<p>What is the addition method in solving linear systems?</p>	<p>Addition Method</p>

programming techniques.				
AFDA.5 The student will determine optimal values in problem situations by identifying constraints and using linear programming techniques.	3.4: How Long Can You Live	Student Extra Practice Workbook: p. 25 - 26	What are special rules for solving linear inequalities? What is a compound inequality? When do you use closed or open intervals in graphing solutions to inequalities?	Inequality Compound Inequality Closed Interval Open Interval
AFDA.5 The student will determine optimal values in problem situations by identifying constraints and using linear programming techniques.	3.5: Will Trees Grow	Student Extra Practice Workbook: p. 25 - 26	How do you shade solutions to systems of linear inequalities? What do the different shadings represent in systems of linear inequalities?	Half - Plane System of Linear Inequalities Corner Points
AFDA.5 The student will determine optimal values in problem situations by identifying constraints and using linear programming techniques.	3.6: Helping Hurricanes Victims 3.7: Healthy Burgers	Student Extra Practice Workbook: p 27	What are constraints and how are they represented in inequalities?	Objective Function Constraints Feasible Region Feasible Points

<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics.</p> <p>AFDA.2 The student will use knowledge of transformations to write an equation given the graph of a function (linear, quadratic, exponential, and logarithmic).</p> <p>AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>4.1: The Amazing Property of Gravity</p>	<p>Student Extra Practice Workbook: p. 29 - 30</p>	<p>What are the characteristics of quadratic functions?</p> <p>How are transformations related to quadratic functions?</p> <p>What methods are used to represent quadratic equations?</p>	<p>Parabola Quadratic Equation</p>
<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics. Key concepts include: (c) domain and range (e) intercepts</p> <p>AFDA.2 The student will use knowledge of transformations to write an equation given the graph of a function (linear, quadratic, exponential, and logarithmic).</p>	<p>4.2: Baseball and Sears Tower</p>	<p>Students Extra Practice Workbook: p. 29 - 30</p>	<p>What is the standard form of quadratic functions?</p> <p>How do the different values affect the graph of a quadratic function?</p>	<p>Quadratic Term Linear Term Constant Term Coefficients Turning Point</p>

<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics. Key concepts include: (b) local and absolute maxima and minima (c) domain and range (e) intercepts (f) intervals in which the function is increasing/decreasing</p> <p>AFDA.2 The student will use knowledge of transformations to write an equation given the graph of a function (linear, quadratic, exponential, and logarithmic).</p>	<p>4.3: The Shot Put</p>	<p>Students Extra Practice Workbook: p. 31 - 32</p>	<p>How can you identify the vertex of a parabola graphically and algebraically?</p> <p>How do you determine if a vertex is a maximum or minimum?</p> <p>What is the meaning of the vertex and intercepts in a practical problem?</p>	
<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics. Key concepts include: (c) zeros (d) intercepts</p>	<p>4.4: Per Capita Personal Income</p>	<p>Students Extra Practice Workbook: p. 31 - 32</p>	<p>How do you solve quadratic equations algebraically and graphically?</p>	<p>Quadratic Equation Zero of the Function</p>

Third Nine Weeks Instruction

SOL/Essential Knowledge and Skills	Textbook/Chapter and Section	Resources	Key Questions	Vocabulary
<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics.</p> <p>AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>4.5: Sir Isaac Newton</p>	<p>Student Extra Practice Workbook: p. 33 - 34</p>	<p>What is the GCF?</p> <p>How can you find the GCF of numbers and variables?</p> <p>What methods exist for factoring trinomials?</p>	<p>Zero Product Principle Factoring Common Factor Greatest Common Factor</p>
<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics. Key concepts include: (b) local and absolute maxima and minima (d) zeros (e) intercepts</p> <p>AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>4.6: Ups and Downs</p>	<p>Student Extra Practice Workbook: p. 35</p>	<p>What is the quadratic formula?</p> <p>When do you use the quadratic formula?</p> <p>What does the quadratic formula determine?</p>	<p>Quadratic Formula</p>

<p>AFDA.2 The student will use knowledge of transformations to write an equation given the graph of a function.</p> <p>AFDA.3 The student will collect data and generate an equation for the curve (linear, quadratic, exponential, and logarithmic) of best fit to model real-world problems or applications. Students will use the best fit equation to interpolate function values, make decisions, and justify conclusions with algebraic and/or graphical models.</p>	<p>4.7: Air Quality in Atlanta</p>	<p>Student Extra Practice Workbook: p. 36</p>	<p>How do you solve for quadratic regression using graphing utilities?</p>	
<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics. Key concepts include: (b) local and absolute maxima and minima (f) intervals in which the function is increasing / decreasing (g) end behaviors</p> <p>AFDA.2 The student will use knowledge of transformations to write an equation given the graph of a function (linear, quadratic, exponential, and logarithmic).</p>	<p>4.8: A Thunderstorm</p> <p>4.9: The Power of Power Function</p>	<p>Student Extra Practice Workbook: p. 37 - 38</p>	<p>What are the characteristics of direct variation tables and graphs?</p> <p>What is the proportionality constant and how do you find it?</p>	<p>Vary Directly Proportionality Constant Direct Variation Constant of Variation Power Functions</p>

<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics. Key concepts include: (b) local and absolute maxima and minima (f) intervals in which the function is increasing / decreasing (g) end behaviors</p> <p>AFDA.2 The student will use knowledge of transformations to write an equation given the graph of a function (linear, quadratic, exponential, and logarithmic).</p>	<p>4.10: Speed Limits 4.11: Loudness of a Sound</p>	<p>Student Extra Practice Workbook: p. 37 - 38</p>	<p>How do you determine horizontal and vertical asymptotes?</p> <p>What is the difference between inverse and direct variation?</p> <p>What are the properties of inverse variation graphs?</p>	<p>Horizontal Asymptote Vertical Asymptote Inverse Variation Function Constant of Variation</p>
	<p>5.1: Going Shopping</p>	<p>Student Extra Practice Workbook: p. 39 - 40</p>	<p>What are growth and decay factors?</p> <p>How does growth factor relate to percent increases?</p> <p>How does decay factors relate to percent decreases?</p>	<p>Growth Factor Decay Factor</p>
	<p>5.2: Take an Additional 20% Off</p>	<p>Students Extra Practice Workbook: p. 39 - 40</p>	<p>What are consecutive growth and decay factors?</p>	<p>Cumulative Factors</p>

<p>AFDA.1 The student will investigate and analyze functions families and their characteristics. Key concepts include: (a) continuity NEW AFDA.1a – Delete Continuity (c) domain and range (e) intercepts (f) intervals in which the function is increasing/decreasing (h) asymptotes AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>5.3: Inflation</p>	<p>Student Extra Practice Workbook: p. 41 - 42</p>	<p>How do you recognize exponential functions from equations? How do you graph exponential functions and what are its characteristics? How is an exponential function related to growth and decay factors?</p>	<p>Exponential Function Exponential Growth Exponential Decay</p>
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<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics. Key concepts include: c) domain and range d) zeros e) intercepts f) intervals in which the function is increasing/decreasing g) end behaviors h) asymptotes</p> <p>AFDA.2 The student will use knowledge of transformations to write an equation given the graph of a function (linear, quadratic, exponential, and logarithmic).</p>	<p>5.4: The Summer Job</p>	<p>Student Extra Practice Workbook: p. 41 - 42</p>	<p>What are the properties of exponential graphs? How will transformations affect exponential graphs?</p>	
<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics. Key concepts include: d) zeros e) intercepts</p> <p>AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>5.5: Cellular Phones</p>	<p>Student Extra Practice Workbook: p 41 - 42</p>	<p>What is doubling and halving time? How do you determine growth or decay factors from an exponential function?</p>	<p>Doubling Time Halving Time</p>

	5.6: Population Growth		How do you determine annual growth or decay rates?	
	5.7: Time is Money		What are the differences between simple and compound interest?	Compound Interest Future Value Effective Yield Continuous Compounding
	5.8: Continuous Growth and Decay		How does base e affect exponential functions? What is the relationship between exponential functions and continuous growth and decay exponential functions?	
<p>AFDA.1 The student will investigate and analyze function families and their characteristics.</p> <p>AFDA.3 The student will collect data and generate an equation for the curve of best fit to model real-world problems or applications. Students will use the best fit equation to interpolate function values, make decisions, and justify conclusions with algebraic and/or graphical models.</p> <p>AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	5.9: Bird Flu	Students Extra Practice Workbook: p. 44	<p>What predictions can be made from exponential regression equations using known characteristics of exponential functions?</p> <p>How do you determine whether to use linear, quadratic, or exponential regression?</p>	

<p>AFDA.1 The student will investigate and analyze function (linear, quadratic, exponential, and logarithmic) families and their characteristics.</p>	<p>5.10: The Diameter of Spheres</p>	<p>Students Extra Practice Workbook: p. 45 - 46</p>	<p>What is a logarithm? What are exponential and logarithmic statements and how do you write them?</p>	<p>Logarithms Common Logarithms Natural Logarithms e</p>
<p>AFDA.1 The student will investigate and analyze families and their characteristics. Key concepts include: a) continuity b) local and absolute maxima and minima c) domain and range e) intercepts f) intervals in which the function is increasing/decreasing g) end behaviors h) asymptotes AFDA.2 The student will use knowledge of transformations to write an equation given the graph of a function. AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>5.11: Walking Speed of Pedestrians</p>	<p>Students Extra Practice Workbook: p. 45 - 46</p>	<p>What is the inverse of exponential functions? What are the properties of logarithmic functions?</p>	<p>Logarithmic Functions Inverse Functions Vertical Asymptote</p>

<p>AFDA.3 The student will collect data and generate an equation for the curve of best fit to model real-world problems or applications. Students will use the best fit equation to interpolate function values, make decisions, and justify conclusions with algebraic and/or graphical models.</p> <p>New AFDA.3 – Delete Generate and use a best fit logarithmic equation</p> <p>AFDA.4 The student will transfer between and analyze multiple representations of functions including algebraic formulae, graphs, tables, and words. Students will select and use appropriate representations for analysis, interpretation, and prediction.</p>	<p>5.12: Walking Speed of Pedestrians Continued</p>	<p>Students Extra Practice Workbook: p. 45 - 46</p>	<p>How do you compare the average rate of change in increasing logarithmic, linear, and exponential functions?</p> <p>How do you determine the regression equation of natural logarithmic functions?</p>	
<p>AFDA.6 The student will calculate probabilities. Key concepts include: (e) Law of Large Numbers</p>	<p>6.1: Chances Are</p>	<p>Students Extra Practice Workbook: p. 49 - 50</p>	<p>What is relative frequency?</p> <p>How do you determine theoretical and experimental probabilities?</p> <p>What is the law of large numbers?</p> <p>What are the differences in the properties of probabilities?</p>	<p>Relative Frequency Event Probability of an Event Random Sample Space Probability Distribution Theoretical Probability Experimental Probability Simulation</p>
<p>AFDA.6 The student will calculate probabilities. Key concepts include: (d) counting techniques</p>	<p>6.2: Choices</p>	<p>Students Extra Practice Workbook: p. 49 - 50</p>	<p>What is the multiplication principle of counting?</p> <p>How can Venn Diagrams be used to represent relationships?</p>	<p>Tree Diagram Complement of an Event Venn Diagram</p>

AFDA.6 The student will calculate probabilities. Key concepts include: (d) counting techniques	6.6: Colorful Probabilities			

Fourth Nine Weeks Instruction

SOL/Essential Knowledge and Skills	Textbook/Chapter and Section	Resources	Key Questions	Vocabulary
AFDA.6 The student will calculate probabilities. Key concepts include: (b) dependent and independent events (c) addition and multiplication rules	6.3: Experimenting with Probabilities	Student Extra Practice Workbook: p. 51 - 52	What are the differences between independent and dependent events? What are mutually exclusive events? What is the difference between “and” and “or” probability problems?	Independent Dependent Mutually Exclusive
AFDA.6 The student will calculate probabilities. Key concepts include: (a) conditional probabilities (b) dependent and independent events	6.4: Conditional Probabilities	Student Extra Practice Workbook: p. 51 - 52	What is a conditional probability problem? How do you find conditional probabilities using sample space?	
AFDA.6 The student will calculate probabilities. Key concepts include: (a) conditional probabilities	6.5: First Serve	Student Extra Practice Workbook: p. 53 - 54		
AFDA.6 The student will calculate probabilities. Key concepts include: (d) counting techniques	6.7: Selecting and Rearranging Things	Student Extra Practice Workbook: p. 53 - 54	When do you know when to use permutations and combinations?	Factorial Permutation Combination
	7.1: Visualizing Trends	Student Extra Practice Workbook: p. 55 - 56	How can scale factors represent or misrepresent certain situations?	Scale Factor
	7.2: Bald Eagle Population	Student Extra Practice Workbook: p. 55 - 56	How can bar graphs and circle graphs be interpreted?	

<p>AFDA.8 The student will design and conduct an experiment/survey. Key concepts include: (d) data collection (e) data analysis and reporting</p>	<p>7.3: The Class Survey</p>	<p>Students Extra Practice Workbook: p. 55 - 56</p>	<p>What is a stem and leaf plots and how can it be used to organize data? What methods can be used to organize data?</p>	<p>Frequency Dot Plot Frequency Distribution Classes Class Width Stem Leaf</p>
<p>AFDA.8 The student will design and conduct an experiment/survey. Key concepts include: (e) data analysis and reporting</p>	<p>7.4: Class Surveys Continued</p>	<p>Student Extra Practice Workbook: p. 57 - 58</p>	<p>What are the measures of central tendency? What are the differences between percentiles and quartiles?</p>	<p>Central Tendency Mean Median Midrange Mode Resistant Measure</p>
<p>AFDA.8 The student will design and conduct an experiment/survey. Key concepts include: a) sample size b) sampling technique c) controlling sources of bias and experimental error</p>	<p>7.5: Sampling a Population</p>	<p>Student Extra Practice Workbook: p. 59 - 60</p>	<p>What are the differences between census and sampling? What are the characteristics of simple random sample? How does sample size affect results?</p>	<p>Census Sample Sampling Bias Simple Random Sample</p>
<p>AFDA.8 The student will design and conduct an experiment/survey. Key concepts: b) sampling technique c) controlling sources of bias and experimental error d) data collection</p>	<p>7.6: Highway Proposal - Yes or No?</p>	<p>Student Extra Practice Workbook: p 59 - 60</p>	<p>What characteristics are shown in a well defined sample survey? How can a sample be biased?</p>	<p>Sample Survey Sampling Frame Nonrespondents Strata Stratified Sampling Self-selection Sampling Plan</p>

<p>AFDA.8 The student will design and conduct an experiment/survey. Key concepts include: b) sampling technique c) controlling sources of bias and experimental error d) data collection e) data analysis and reporting</p>	<p>7.7: Statistical Survey 7.8: What's the Cause</p>	<p>Students Extra Practice Workbook: p. 59 - 60</p>	<p>When can a causal relationship be established?</p>	<p>Experimental Unit Control Group Treatment Statistically Significant Double-blind Design of Experiments Placebo Placebo-Effect Replication</p>
<p>AFDA.7 The student will analyze the normal distribution. Key concepts include: a) characteristics of normally distributed data</p>	<p>7.9: A Switch Decision</p>	<p>Students Extra Practice Workbook: p. 61 - 62</p>	<p>How do you measure the variability of a frequency distribution?</p>	<p>Standard Deviation Boxplot Five-number Summary</p>
<p>AFDA.7 The student will analyze the normal distribution. Key concepts include: a) characteristics of normally distributed data c) normalizing data using z-scores</p>	<p>7.10: What is Normal</p>	<p>Students Extra Practice Workbook: p. 63 - 64</p>	<p>What is a normal distribution? What are the properties of the normal curve? How do you find the z-score and what does the z-score represent?</p>	<p>Normal Distribution Normal Curve Z-scores</p>
<p>AFDA.7 The student will analyze the normal distribution. Key concepts include: a) characteristics of normally distributed data c) normalizing data using z-scores d) area under the standard normal curve and probability</p>	<p>7.11: Part-Time Jobs</p>	<p>Students Extra Practice Workbook: p. 63 - 64</p>	<p>How do you determine the area under a curve using the z-table?</p>	<p>Cumulative Probability Density Function</p>

<p>AFDA.7 The student will analyze the normal distribution. Key concepts include: a) characteristics of normally distributed data b) percentiles New AFDA.7b – Delete Analyze a normal distribution using percentiles c) normalizing data using z-scores d) area under the standard normal curve and probability</p>	<p>7.12: Who Did Better?</p>	<p>Students Extra Practice Workbook: p. 63 - 64</p>	<p>How do you compare different x-values in a normal distribution using z-scores?</p>	
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Resources

<http://tinyurl.com/kbmmq21>

- Projects and hand on activities developed by Frederick County
- Organized by subject

<https://sites.google.com/site/frederickcountyvaafdacollab/>

- Frederick County teacher drive
- Many assignments, tests, and quizzes organized by subject