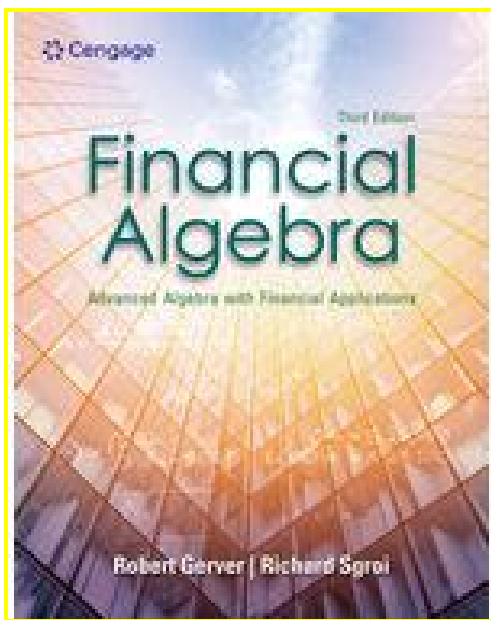


Algebra 2 with Financial Applications CURRICULUM



Grade Level(s): 10-11

Curriculum Author(s): Raymond Robillard

Course Description: Students in this full-year Algebra 2 with Financial Applications course will further their study of Algebra through real-world financial applications. The course covers many Algebra 2 topics from the perspective of financial applications under eight umbrellas: discretionary expenses, banking, investing, credit, employment and income taxes, automobile ownership, independent living, and retirement planning & household budgeting. Students will experience the interrelatedness of mathematical topics, find patterns, make conjectures, and extrapolate from known situations to unknown situations. The mathematical topics contained in this course are introduced, developed, and applied in an as-needed format within the financial settings covered. Students are encouraged to use a variety of problem-solving skills and strategies in real-world contexts, and to question outcomes using mathematical analysis and data to support their findings. This course offers students multiple opportunities to use, construct, question, model, and interpret financial situations through symbolic, algebraic, graphical, geometric, and verbal representations. This course is an alternative to taking Algebra 2.

Credit type: STEM, 1 credit (Fulfills the State of Connecticut Financial Literacy Requirement)

Year At A Glance

Unit Title	Overarching Essential Question	Overarching Enduring Understanding	Vision of A Learner “I Can” Statements
Discretionary Expenses	What is an essential expense?	Statistics can be used to examine the types of expenses we may have now and in the future.	TCC4(9-12); CCE1(9-12); AA1(9-12)
Banking Services	How does banking help us plan for the future?	Banks have a variety of different account options available, each with unique advantages and disadvantages.	TCC3(9-12); TI3(9-12); AA4(9-12)
Consumer Credit	How do you maintain and monitor credit and loans?	Credit provides you with a way to increase your standard of living, as long as your purchases are made with careful financial planning.	TI3(9-12); AA2(9-12)
Automobile Ownership	What data is important to the driver of a car?	Before embarking on the purchase of an automobile, students need to be aware of the finances involved with operating a car.	TI2(9-12); AA4(9-12)
Employment Basics	In what ways can you be compensated for work that you do at a job?	It is important to learn and understand as much as possible about the job you hold: the salary you make, the benefits offered, and the taxes you pay.	TCC2(9-12); AA4(9-12)
Income Taxes	How do we determine who pays taxes and how much they pay?	The money collected through taxes helps our government fund police forces, fire departments, political officers, teachers, research, military defense, public assistance programs, and much more.	TI3(9-12); TCC4(9-12)
Independent Living	What factors come into play when buying or renting a home?	There are many factors that influence how and where you live and students will want to make wise, well-thought-out decisions,	TCC1(9-12); AA1(9-12)
The Stock Market	What are stocks?	With a strong knowledge of the stock market, cooperations, and investment	TCC4(9-12); AA4(9-12)

		strategies, you as an investor can make decisions that are based on experience, data, trends, and mathematics.	
Mathematically Modeling a Business Start-Up	What do I need to know to start my own business?	Creating a business model allows a person to use variables and examine relationships among those variables to make predictions that will help maximize profit.	TCC4(9-12); CCE4(9-12)
Planning for Retirement	Why and how should you save for retirement?	It is important to become knowledgeable about the pros and cons of each type of retirement plan so you are ready when you retire.	CCE3(9-12); TI4(9-12)
Preparing a Budget	How do you organize all your expenses so you can spend accordingly?	Budgeting provides a clear picture of how much you are spending and what you are spending it on.	TCC4(9-12); AA1(9-12)

Unit 1 - Discretionary Expenses

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

The problems, activities, and projects inherent in studying discretionary and essential expenses are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP2-Reason abstractly and quantitatively.
- MP3-Construct viable arguments and critique the reasoning of others.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP8-Look for and express regularity in repeated reasoning.

Common Core State Standards for Mathematical Content that are Addressed

- F-IF1-Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$.
- F-IF7a-Graph linear and quadratic functions and show intercepts, maxima, and minima.
- F-IF8-Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
- S-ID1-Represent data with plots on the real number line (dot plots, histograms, and box plots).
- S-ID2-Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
- S-ID4-Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.
- S-ID6-Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
- S-ID7-Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
- S-ID8-Compute (using technology) and interpret the correlation coefficient of a linear fit.
- S-ID9-Distinguish between correlation and causation.
- N-Q1-Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
- N-Q2-Define appropriate quantities for the purpose of descriptive modeling.
- N-Q3-Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- A-CED2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with

labels and scales.	
<p>Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)</p> <p>TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.</p> <p>CCE1(9-12): I can initiate discussions with my peers and teachers about a variety of topics, respecting differing viewpoints, actively listening to others, and responding thoughtfully with peer-reviewed evidence that is free of bias.</p> <p>AA1(9-12): I can evaluate different approaches and justify the best pathway to success.</p>	
<p>Understandings: Students will understand that...</p> <ul style="list-style-type: none"> Statistics can be used to examine the types of expenses we may have now and in the future. Keeping a mathematical eye on your spending will help you become an informed and skilled consumer. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> What is an essential expense? What can graphs tell us about our finances? How can past trends predict future occurrences?
<p>Students will know...</p> <ul style="list-style-type: none"> The differences between essential and discretionary expenses The differences between wholesale and retail prices The different types of warranties available to them How percentile rank can be used to interpret data The difference between measures of central tendency and measures of dispersion How the different measures of dispersion differ from each other How linear regression analysis can assist in interpreting financial data 	<p>Students will be able to...</p> <ul style="list-style-type: none"> Calculate percent markup and percent discount Create and interpret a frequency distribution table Use sigma notation or a frequency distribution table to determine the mean, median, and mode of a data set Calculate the expiration date of a warranty Define, determine, and interpret cumulative, relative, and relative cumulative frequencies Model a situation using a spreadsheet Define, determine, and interpret percentiles Compute the range, mean deviation, variance, and standard deviation of a data set Measure dispersion using standard deviation units Compute z-scores Find percentages using the normal curve Compute raw scores using z-scores Graph bivariate data to construct a scatterplot Interpret patterns and trends based on data Fit a linear regression equation to a scatter plot Find and interpret the correlation coefficient Make predictions based on lines of best fit
<p>Key Vocabulary: gross income, disposable income, essential expense, discretionary expense, wholesale prices, retail prices, markup, statistics, data, measures of</p>	

central tendency, mean, median, mode, subscript, index, outlier, skewed data set, bimodal, frequency distribution, planned obsolescence, warranty, implied warranty, express warranty, full warranty, limited warranty, extended warranty, caveat emptor, warranty expiration date, cumulative frequency, relative frequency, relative cumulative frequency, spreadsheet, cell, percentile, percentile rank, dispersion, range, mean deviation, mean absolute deviation, variance, standard deviation, raw data, standard score, z-score, normal curve, normal distribution, bell curve, asymptotic, tails, univariate data, bivariate data, scatterplot, trend, correlation, causal relationship, explanatory variable, response variable, lurking variable, linear regression analysis, linear regression equation, independent variable, dependent variable, domain, interpolation, extrapolation, correlation coefficient

Assessment Evidence

Performance Tasks:

A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- “You Write the Story!” - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- “What’s the Problem?” - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- “Really? Really! Revisited” - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:

 [Assessment Example.pdf](#)

Other Evidence:

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit is all about discretionary spending and how statistics can be used to interpret and analyze expenses and trends. As students begin, they learn how the measures of central tendency can be used to better understand expense data, and how to organize that data efficiently in a variety of ways. They will then investigate how measures of dispersion can help analyze data using entertainment expenses. One measure of dispersion, the standard deviation, is used to create standard scores, and compare them to raw scores and percentages. Finally, personal expenses in the forms of paired data are charted and analyzed using scatter plots and linear regression analyses. The purpose of this unit is to show how statistics can be used to make sense of finance-related discretionary expense data.

This unit is broken down into the following sections:

- 1.1 - Discretionary and Essential Expenses
- 1.2 - Travel Expenses
- 1.3 - Entertainment Expenses
- 1.4 - Vacation Expenses
- 1.5 - Personal Expenses

The following vision of a learner attributes are assessed through the following summative activities:

TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.

CCE1(9-12): I can initiate discussions with my peers and teachers about a variety of topics, respecting differing viewpoints, actively listening to others, and responding thoughtfully with peer-reviewed evidence that is free of bias.

AA1(9-12): I can evaluate different approaches and justify the best pathway to success.

You write the story: Students are asked to reflect on the differences that they observed between discretionary expenses and mandatory expenses. A graphic is provided that shows the way different age groups spend their time(as opposed to their money). Students are asked to write a new article that describes and interprets the data and infographic. They should use terminology and statistical processes from the unit.

Really? Really! Revisited: Students will utilize data on the number of internet connected devices used over the last 6 years and predictions of the number of devices used over the next 5 years. By conducting a statistical analysis, students will answer many questions and make predictions about this data as well as reflect on the ramifications for society moving forward.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at <https://www.cengage.com> that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 2 - Banking Services

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

The problems, activities, and projects inherent in studying banking are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP8-Look for and express regularity in repeated reasoning.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED4-Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance R .
- A-SSE1a-Interpret parts of an expression, such as terms, factors, and coefficients.
- A-SSE1b-Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P .
- A-SSE3-Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
- F-IF4-For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- F-IF8b-Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)12^t$, $y = (1.2)^{t/10}$, and classify them as representing exponential growth or decay.
- F-BF1a-Determine an explicit expression, a recursive process, or steps for calculation from a context.
- F-BF2-Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.*
- F-BF5-Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.
- N-RN1-Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. *For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3}$ to hold, so $(5^{1/3})^3$ must equal 5.*
- N-RN2-Rewrite expressions involving radicals and rational exponents using the properties of exponents.

Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)
 TCC3(9-12): I can integrate relevant information to produce multiple valid solutions.
 TI3(9-12): I can formulate and investigate probing questions to further my learning.
 AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.

Understandings: Students will understand that...

- Banks offer customers ways to safely keep and track their money.
- Banks have a variety of different account options available, each with unique advantages and disadvantages.
- Long term planning, including a schedule for making withdrawals or deposits, is critical to meeting financial goals.

Essential Questions:

- What options do banks offer for consumers?
- What is interest and how is it computed?
- How does banking help us plan for the future?

Students will know...

- How checking account deposits, withdrawals, and electronic funds transfers are made and recorded
- The differences between and among types of checking accounts
- The basic vocabulary of savings accounts
- How the components of an arithmetic sequence work
- How interest and inflation affect purchasing power
- Interest is accrued on interest
- How the compound interest formula is derived
- The differences between the terms finite and infinite

Students will be able to...

- Keep accurate financial records
- Protect themselves from identity fraud
- Use a check register
- Reconcile a checking account with a bank statement by hand and by using a spreadsheet
- Compute simple interest using the simple interest formula
- Compute compound interest using a table
- Make computations using the compound interest formula
- Compute interest on an account that is compounded continuously
- Calculate the future value of a periodic deposit investment
- Graph the future value function
- Calculate the present value of a single deposit investment
- Calculate the present value of a periodic deposit investment
- Determine the maturity (term) of an investment
- Construct exponential and logarithmic models of a situation
- Evaluate logarithms
- Express exponential models as logarithms
- Use the change-of-base formula
- Evaluate common and natural logarithms
- Apply the One-to-One Property and Power Property
- Determine the term of systematic savings and withdrawals
- Interpret the graph of a future value function

Key Vocabulary:

checking account, check, electronic funds transfer(EFT), payee, drawer, check clearing, automated teller machine(ATM), personal identification number(PIN), debit card, ATM card, deposit slip, direct deposit, hold, endorse, canceled, insufficient funds, overdraft protection, maintenance fee, interest, traditional checking account, interest-bearing checking account, free checking account, online checking account, lifeline checking account, student e-checking account, single account, joint account, mobile payment apps, peer-to-peer(P2P), identity fraud, encryption, check register, debits, credits, account number, bank statement, statement period, starting balance, ending balance, outstanding deposits, outstanding withdrawals, balancing, reconciling, savings account, interest rate, principal, annual percentage rate(APR), simple interest, simple interest formula, statement savings, minimum balance, money market account, 529 Plan, high-yield interest accounts, certificate of deposit(CD), maturity, liquidity, time value of money, arithmetic sequence, common difference, finite arithmetic sequence, infinite arithmetic sequence, inflation, market basket, purchasing power of money, compound interest, annual compounding, semiannual compounding, quarterly compounding, monthly compounding, daily compounding, crediting, compound interest formula, annual percentage yield(APY), CD penalty for early withdrawal, limits, continuous compounding, function, rational function, exponential base(e), future value of an investment, future value of a single deposit investment, periodic investment, biweekly, future value of a periodic deposit investment, rule of 72, present value, present value of a single deposit investment, present value of a periodic deposit investment, maturity, term, logarithmic equation, logarithm(log), common logarithm, antilogarithm, change-of-base formula, natural logarithm, systematic savings account, One-to-One Property, Power Property, systematic withdrawal account

Assessment Evidence**Performance Tasks:**

A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- “You Write the Story!” - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- “What’s the Problem?” - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- “Really? Really! Revisited” - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:

 [Assessment Example.pdf](#)

Other Evidence:

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit is all about checks, debit cards, and what happens to money and its value over different time periods. It is important for students to know how to keep accurate financial records. Reconciling a bank statement is demonstrated in this unit. Students learn about the importance of protecting themselves from errors and threats like identity theft. Students also learn about savings accounts, simple interest, and several types of compounding interest. By using the future value formulas, students see how much a single or periodic deposit would grow over a period of time. The main purpose of this unit is for students to be smart avers through their entire lifetime.

This unit is broken down into the following sections:

- 2.1 - Checking Accounts
- 2.2 - Reconciling a Bank Statement
- 2.3 - Savings Accounts
- 2.4 - Exploring Compound Interest
- 2.5 - Compound Interest Formula
- 2.6 - Continuous Compounding
- 2.7 - Future Value of Investments
- 2.8 - Present Value of Investments
- 2.8 - Present Value of Investments
- 2.9 - The Term of a Single Deposit Amount
- 2.10 - The Term of a Systematic Account

The following vision of a learner attributes are assessed through the following summative activities:

TCC3(9-12): I can integrate relevant information to produce multiple valid solutions.

TI3(9-12): I can formulate and investigate probing questions to further my learning.

AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.

You write the story: Students will analyze a double box plot regarding the average savings by age, comparing mean and median bank account balances. With this info they will write a news-style article that identifies and interprets key conclusions about the data. They should use terminology and mathematical processes from the unit in their paper.

Really? Really! Revisited: Students will explore the site fred.stlouisfed.org which houses some of the most comprehensive research on the state of savings by Americans since 1991. From there, they will determine what percentage of income is saved versus used as disposable income. Additionally, they will look at factors that are connected to saving quantities, and seek a correlation that can be used to make predictive conclusions.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at <https://www.cengage.com> that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 3 - Consumer Credit

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

The problems, activities, and projects inherent in studying credit are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP2-Reason abstractly and quantitatively.
- MP3-Construct viable arguments and critique the reasoning of others.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP8-Look for and express regularity in repeated reasoning.

Common Core State Standards for Mathematical Content that are Addressed

- A-SSE1-Interpret expressions that represent a quantity in terms of its context.
- A-SSE1b-Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P .
- A-SSE2-Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.
- A-SSE3-Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
- A-SSE3c-Use the properties of exponents to transform expressions for exponential functions. For example the expression $1.15t$ can be rewritten as $(1.151/12)^{12t} \approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%.
- A-CED3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
- F-BF1a-Determine an explicit expression, a recursive process, or steps for calculation from a context.
- F-IF8b-Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)^{12t}$, $y = (1.2)^{t/10}$, and classify them as representing exponential growth or decay.
- F-LE5-Interpret the parameters in a linear or exponential function in terms of a context.
- N-Q1-Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
- N-Q2-Define appropriate quantities for the purpose of descriptive modeling.
- S-ID6a-Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.

Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)
 TI3(9-12): I can formulate and investigate probing questions to further my learning.
 AA2(9-12): I can assess my past successes and mistakes to change my approach.

Understandings: Students will understand that...

- Credit is a promise to pay in the future for goods and/or services you purchase or use today.
- Credit has both advantages and disadvantages.
- Credit provides you with a way to increase your standard of living, as long as your purchases are made with careful financial planning.

Essential Questions:

- What information is valuable to know before using credit or taking out a loan?
- How do you maintain and monitor credit and loans?

Students will know...

- Definitions of basic credit terms
- The different types of lending institutions
- The available options for student loans
- The basic vocabulary of credit cards
- The components of the minimum payment box and how the information there assists the consumer
- The definition of negative amortization and why the government outlawed its usage by creditors

Students will be able to...

- Compute finance charges for installment purchases
- Compute monthly payments for given loans using a table and using a formula
- Compute interest on loans
- Calculate the interest due in various student loan situations
- Apply the simplified daily interest formula
- Calculate the interest rate, monthly payment, and term for a consolidated loan
- Use the logarithmic loan length formula to determine the term of a loan
- Use regression to find the curve of best fit using data from a loan table
- Compute an average daily balance
- Verify the accuracy of a credit card statement
- Calculate the average daily balance and finance charge using the credit calendar
- Determine if loan consolidation makes sense in a particular situation

Key Vocabulary:

credit, debtor, creditor, earning power, credit rating, credit score, credit reporting agency, FICO score, installment plan, down payment, finance charge, deferred payment plan, layaway plan, flexible payment plan, default, promissory note, principal, cosigner, life insurance, prepayment privilege, prepayment penalty, wage assignment, wage garnishment, balloon payment, lending institution, savings bank, commercial bank, credit union, consumer finance company, pawnshop, collateral, secured loans, unsecured loans, payday loan store, payday loan, career school, scholarships, qualified educational costs, Free Application for Federal Student Aid(FAFSA), Student Aid Report(SAR), expected family

contribution(EFC), federal loan, private loan, Federal Direct Subsidized Loan, defer, Federal Direct Unsubsidized Loan, accrues, Federal Direct PLUS Loan, Federal Direct Consolidation Loan, origination fee, standard repayment plan, graduated repayment plan, income-based repayment(IBR) plan, return on investment(ROI), major, interest capitalization, simplified daily interest formula, gross income, refinance, consolidation, weighted average, weight factor, monthly payment calculator, loan length formula, cubic function, cubic regression equation, credit card, impulse buying, revolving charge account, charge card, identity theft, fraud protection, Truth-in-Lending Act, Schumer Box, Fair Credit Billing Act, Fair Debt Collection Practices Act, average daily balance, billing cycle, credit card statement, account number, credit line, credit limit, available credit, billing data, payment due date, transactions, debt/credit, previous balance, payments/credits, new purchases, late charge, finance charge, new balance, minimum payment, available daily balance, number of days in billing cycle, monthly periodic rate, credit calendar, billing date, minimum payment warning box, negative amortization(NegAm)

Assessment Evidence

Performance Tasks:

A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- “You Write the Story!” - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- “What’s the Problem?” - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- “Really? Really! Revisited” - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:

 [Assessment Example.pdf](#)

Other Evidence:

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit is all about the idea of “buy now and pay later”, or more formally, credit. Students scrutinize the variety of types of loans and corresponding payment plans from different lending institutions. Included in this is a discussion of a very relevant loan: the student loan. Advantages of using credit cards and the laws governing their use is a focus of the later part of the unit, as is reading and understanding credit statements. Students will calculate the average daily balance and finance charge of a statement to verify its accuracy. The main purpose of this unit is for students to manage credit effectively.

This unit is broken down into the following sections:

- 3.1 - Introduction to Consumer Credit
- 3.2 - Loans
- 3.3 - Student Loans
- 3.4 - Loan Calculations and Regression
- 3.5 - Credit Cards
- 3.6 - Credit Card Statement
- 3.7 - Average Daily Balance

The following vision of a learner attributes are assessed through the following summative activities:

TI3(9-12): I can formulate and investigate probing questions to further my learning.

AA2(9-12): I can assess my past successes and mistakes to change my approach.

You write the story: Students will write a paper about the average amount of debt carried by US residents by state. An infographic will be provided and students should summarize the information by considering average values, the degree of variance, and potential explanatory variables for the amount of debt per state. They should use terminology and mathematical processes from the unit in their paper.

Really? Really! Revisited: Students will expand on their mathematical learning of exponential growth, geometry, and ratio/proportion as they answer questions relating to the estimated 1.5 billion credit cards in use today. This culminating activity eschews the financial content of this lesson in favor of more math-heavy questioning as a form of spiral review for students.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at <https://www.cengage.com> that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 4 - Automobile Ownership

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

The problems, activities, and key assignments in this Automobile Ownership Unit offer students opportunities to learn, explore, and use the CCSS Mathematical Practices:

- MP1-Make sense of problems and persevere in solving them.
- MP2-Reason abstractly and quantitatively.
- MP3-Construct viable arguments and critique the reasoning of others.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-CED3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
- A-CED4-Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance R .
- A-REI2-Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
- A-REI11-Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.
- A-SSE1b-Interpret complicated expressions by viewing one or more of their parts as a single entity. For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P .
- A-SSE3-Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
- F-IF1-Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$.
- F-IF2-Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
- F-IF3-Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers. For example, the

Fibonacci sequence is defined recursively by $f(0) = f(1) = 1$, $f(n+1) = f(n) + f(n-1)$ for $n \geq 1$.

- F-IF4-For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- F-IF6-Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
- F-IF7a-Graph linear and quadratic functions and show intercepts, maxima, and minima.
- F-IF7b-Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
- F-IF7e-Graph exponential and logarithmic functions, showing intercepts and end behavior, and trigonometric functions, showing period, midline, and amplitude.
- F-IF8b-Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)12^t$, $y = (1.2)^{1/10}$, and classify them as representing exponential growth or decay.
- F-IF9-Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a graph of one quadratic function and an algebraic expression for another, say which has the larger maximum.
- F-BF2-Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.*
- F-BF5-Understand the inverse relationship between exponents and logarithms and use this relationship to solve problems involving logarithms and exponents.
- F-LE1b-Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
- F-LE1c-Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
- F-LE2-Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
- F-LE4-For exponential models, express as a logarithm the solution to $abct = d$ where a , c , and d are numbers and the base b is 2, 10, or e ; evaluate the logarithm using technology.
- F-LE5-Interpret the parameters in a linear or exponential function in terms of a context.
- G-C5-Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.
- S-ID1-Represent data with plots on the real number line (dot plots, histograms, and box plots).
- S-ID2-Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
- S-ID3-Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
- S-ID4-Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.
- S-ID6-Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

- S-ID7-Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
- S-CP1-Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").
- S-CP2-Understand that two events A and B are independent if the probability of A and B occurring together is the product of their probabilities, and use this characterization to determine if they are independent.
- S-CP3-Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A , and the conditional probability of B given A is the same as the probability of B .
- S-CP4-Construct and interpret two-way frequency tables of data when two categories are associated with each object being classified. Use the two-way table as a sample space to decide if events are independent and to approximate conditional probabilities. *For example, collect data from a random sample of students in your school on their favorite subject among math, science, and English. Estimate the probability that a randomly selected student from your school will favor science given that the student is in tenth grade. Do the same for other subjects and compare the results.*
- S-MD1-Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.
- S-MD2-Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.
- S-MD4-Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

TI2(9-12): I can evaluate my objectives and a variety of credible resources to find the best solutions for any challenge.

AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.

Understandings: Students will understand that...

- Owning an automobile is a tremendous responsibility.
- Before embarking on the purchase of an automobile, students need to be aware of the finances involved with operating a car.
- Automobile knowledge will result in a safer, less expensive, and more enjoyable experience.

Essential Questions:

- What is involved in the purchase of an automobile?
- How does automobile insurance work?
- How does the value of a car change over time?
- What data is important to the driver of a car?

Students will know...

- When to use a box-and-whisker plot or a stem-and-leaf plot for a given situation
- The differences between types of auto insurance coverage
- The definition of depreciation and how it relates to automobile value
- How to write, interpret, and graph a straight-line depreciation

Students will be able to...

- Compute the cost of classified ads for used cars
- Compute the cost of sales tax on automobiles
- Compute quartiles and interquartile range
- Create a frequency distribution from a set of data
- Compute insurance costs and payments on insurance claims
- Compute conditional probabilities based on two-way tables

<p>equation</p> <ul style="list-style-type: none"> • The definition of perception-reaction time as it relates to driving • The definition of breaking distance and time as it relates to driving 	<ul style="list-style-type: none"> • Determine if two events are independent • Read and interpret two-way tables and Venn diagrams • Create Venn diagrams • Create expense functions • Manipulate the exponential depreciation equation in order to determine time, original price, and depreciated value • Write, interpret, and graph an exponential depreciation equation • Write, interpret, and use the distance formula • Use the formula for the relationship between distance, fuel economy, and gas usage • Calculate and compare MPG and MPGe • Compare costs for buying, leasing, and renting a car • Compare gas prices around the world using different international currencies • Calculate perception-reaction time and distance in the English Standard System • Calculate breaking distance in the English Standard System and metric system • Calculate total stopping distance in the English Standard System and metric system • Determine the minimum skid speed using the skid mark formula and the yaw mark formula
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Key Vocabulary:

sales tax, domain, piecewise function, split function, cusp, impression, click, data, measures of central tendency, quartiles, lower quartile, upper quartile, subscript, interquartile range(IQR), stem-and-leaf plot, box-and-whisker plot, box plot, modified box-and-whisker plot, lease, lessee, lessor, liable, negligent, automobile insurance, premium, claim, liability insurance, bodily injury liability(BI), property damage liability(PD), uninsured/underinsured motorist protection(UMP), personal injury protection(PIP), no-fault insurance, comprehensive insurance, collision insurance, car-rental insurance, emergency road service insurance, driver education course, defensive driving course, surcharge, deductible, actuary, probability, event, two-way table, conditional probability, independent events, associated events, Venn diagrams, equiprobable, depreciate, appreciate, straight-line depreciation, linear depreciation, slope, straight-line depreciation equation, expense functions, fixed expense, variable expense, dollar value, historical data, historical depreciation, exponential decay, exponential depreciation, exponential regression, geometric sequence, geometric progression, common ratio, odometer, trip odometer, speedometer, fuel economy measurement, miles per gallons(MPG), miles per gallon equivalent(MPGe), kilowatt hours per 100 miles(kWh/100), kilowatt hour(kWh), kilometers per liter(km/L), English Standard System, metric system, distance formula, currency exchange rate, perception time, reaction time, breaking time, breaking distance, perception-reaction time, perception-reaction distance, total stopping distance, accident reconstructionist, skid mark, shadow skid mark, antilock braking system(ABS), yaw mark, skid speed formula, drag factor, braking efficiency, skid distance, chord, middle ordinate, projectile motion,

trajectory

Assessment Evidence

Performance Tasks:

A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- “You Write the Story!” - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- “What’s the Problem?” - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- “Really? Really! Revisited” - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:

 [Assessment Example.pdf](#)

Other Evidence:

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit is all about examining the many different facets of becoming an informed, responsible driver, from purchasing a car to insuring it and covering needed repairs. Students discuss the costs associated with buying and registering a car, as well as how that investment depreciates in value over time. Types of insurance are compared and contrasted as well as a comparison between buying and leasing. Knowledge of reaction time and safe driving are important both from their mathematical relevance, but also for the safety of all. The main purpose of this unit is to make the time spent behind the wheel of an automobile safer and more enjoyable.

This unit is broken down into the following sections:

- 4.1 - Automobile Ads
- 4.2 - Automobile Transactions
- 4.3 - Automobile Insurance
- 4.4 - Probability: The Basis of Insurance
- 4.5 - Linear Automobile Depreciation

- 4.6 - Historical and Exponential Depreciation
- 4.7 - Driving Data
- 4.8 - Driving Safety Data
- 4.9 - Accident Investigation Data

The following vision of a learner attributes are assessed through the following summative activities:

T12(9-12): I can evaluate my objectives and a variety of credible resources to find the best solutions for any challenge.

AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.

You write the story: Students will write a paper about the growth of electric vehicles. Data is provided in the form of a cumulative frequency distribution extrapolated for the years 2026 to 2040. Students will debate whether the growth of this type of vehicle is positive from the perspectives of cost, safety, reliability, and effect on the environment. They should use terminology and mathematical processes from the unit in their paper.

Really? Really! Revisited: Students will study the connection between gas prices and inflation. A key question will be, “have gas prices changed consistently with inflation? And, if not, what factors can be connected to deviations from an exponential pattern of inflation since the year 1950. Students will need to use a regression model using data provided. Finally, a conclusion should be made about what gas prices will look like x years from now.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at <https://www.cengage.com> that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 5 - Employment Basics

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

The problems, activities, and projects inherent in studying employment are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP7-Look for and make use of structure.
- MP8-Look for and express regularity in repeated reasoning.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED1-Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- A-CED2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-CED4-Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance R .
- A-REI3-Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- F-IF2-Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
- F-IF4-For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- F-IF7b-Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
- F-BF1-Write a function that describes a relationship between two quantities.
- F-LE1-Distinguish between situations that can be modeled with linear functions and with exponential functions.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)
TCC2(9-12): I can evaluate evidence from multiple perspectives, and recognize their limitations and implications, in order to justify new conclusions.

AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.

<p>Understandings: Students will understand that...</p> <ul style="list-style-type: none"> • It is important to learn and understand as much as possible about the job you hold: the salary you make, the benefits offered, and the taxes you pay. • You need to be well prepared to enter the workforce. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> • In what ways can you be compensated for work that you do at a job? • What types of deductions are taken from your paycheck?
<p>Students will know...</p> <ul style="list-style-type: none"> • The meanings of abbreviations in classified ads • The advantages and disadvantages of pay based on production • The value and importance of various employee benefits 	<p>Students will be able to...</p> <ul style="list-style-type: none"> • Compute periodic salary based on annual contract salary • Express classified ad prices as piecewise functions • Compute weekly, semimonthly, and biweekly earnings given annual salary • Compute hourly pay and overtime pay given hourly rate • Compute annual salaries based on annual percentage increases • Compute pay based on percent commission • Compute piecework pay • Compute paycheck deductions for Social Security and Medicare
<p>Key Vocabulary: employment agency, recruitment agency, employer paid, fee paid, applicant paid, resume, Form W-4: Employee's Withholding Allowance Certificate, benefits, self-employed, discount, direct deposit, paycheck advance, pay yourself first, hourly rate, regular hours, overtime hours, overtime hourly rate, time-and-a-half overtime, double-time pay, gross pay, minimum wage, commission, royalty, pieceworkers, piecework rate, insurance, paid vacation time, paid time off(PTO), stock ownership plans, childcare leave, contribution matching, family healthcare, individual healthcare, deductible, copayment, copay, pension, unemployment insurance, base period, worker's compensation, Social Security, Federal Insurance Contributions Act(FICA), FICA taxes, Social Security tax, Medicare tax, maximum taxable income, Social Security number, cusp</p>	
<p style="text-align: center;">Assessment Evidence</p>	
<p>Performance Tasks: A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:</p> <ul style="list-style-type: none"> • Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice. • "You Write the Story!" - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills. • "What's the Problem?" - Equations give students the opportunity to think backwards and create a problem using the given 	<p>Other Evidence:</p> <ul style="list-style-type: none"> • Warmup problems provided in each lesson • Checks for understanding provided in each lesson • Book application problems

<p>numbers.</p> <ul style="list-style-type: none"> • “Really? Really! Revisited” - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature. <p>An example of these types of activities can be seen here:</p> <p> Assessment Example.pdf</p>	
<p style="text-align: center;">Learning Plan</p>	
<p>This unit is an orientation into the employment world. First, students examine how to find a job. Next, students learn about the variety of ways they are compensated for this work, as well as the types of benefits they can expect to receive as part of their job. The flip-side to that is the various taxes and deductions that are taken from one’s paycheck, also valuable information. The main purpose of this unit is that students master the knowledge of employee basics to ensure they can manage their adult finances wisely.</p> <p>This unit is broken down into the following sections:</p> <p>5.1 - Looking for Employment 5.2 - Pay Periods and Hourly Rates 5.3 - Commissions, Royalties, and Piecework Pay 5.4 - Employee Benefits 5.5 - Social Security and Medicare</p> <p>The following vision of a learner attributes are assessed through the following summative activities:</p> <p>TCC2(9-12): I can evaluate evidence from multiple perspectives, and recognize their limitations and implications, in order to justify new conclusions. AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.</p> <p>You write the story: Students will write a paper about the national unemployment rate, by month, over the course of the last 10 years. They will be provided with a line graph with different colored lines for each year and the months of the year on the horizontal axis. They will make conclusions about why the unemployment rate peaked in April of 2014 as well as commenting on other trends. They should use terminology and mathematical processes from the unit in their paper.</p> <p>Really? Really! Revisited: Students will study the change in employment numbers for various careers (i.e.-Nurse Practitioners, Data Scientists, Software Developers, Physical Therapists, etc.). They will judge the reason why the information was presented in the way it was as well as extrapolating to other careers and to future employment numbers. Their conclusions should be backed up by research beyond the presented information from their textbook.</p>	
<p>Teacher Resources:</p>	

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at <https://www.cengage.com> that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 6 - Income Taxes

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

The problems, activities, and projects inherent in studying employment and income taxes are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP7-Look for and make use of structure.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED1-Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- A-CED2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-CED3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
- A-CED4-Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance R .
- A-REI3-Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- A-SSE1-Interpret expressions that represent a quantity in terms of its context.
- F-BF1-Write a function that describes a relationship between two quantities.
- F-BF2-Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.*
- F-IF1-Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$.
- F-IF2-Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
- F-IF4-For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- F-IF7b-Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

<ul style="list-style-type: none"> • F-IF8-Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function. • F-LE1-Distinguish between situations that can be modeled with linear functions and with exponential functions. 	
<p>Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)</p> <p>TI3(9-12): I can formulate and investigate probing questions to further my learning.</p> <p>TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.</p>	
<p>Understandings: Students will understand that...</p> <ul style="list-style-type: none"> • The money collected through taxes helps our government fund police forces, fire departments, political officers, teachers, research, military defense, public assistance programs, and much more. • There are many different types of taxes, including sales tax, property tax, Social Security Taxes, and income taxes. • It is important to keep up to date on changes to our tax code system. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> • How do we determine who pays taxes and how much they pay? • How do you compute your tax liability?
<p>Students will know...</p> <ul style="list-style-type: none"> • Algebraic expressions of tax scales • The various components and importance of a pay stub, W-2 form, and 1099 form • The different types of income that can be reported using Form 1040 and Schedule 1 • The differences between a tax credit and a tax deduction 	<p>Students will be able to...</p> <ul style="list-style-type: none"> • Compute federal income taxes using a tax table and tax schedules • Construct income tax graphs using compound equations(6.4) • File a Form 1040 to compute tax liability • File Form 1040 with Schedule 1 • File Form 1040 with Schedule A
<p>Key Vocabulary: property tax, sales tax, taxable income, income tax, Internal Revenue Service(IRS), single, married filing jointly, qualifying widow(er), married filing separately, head of household, constraint, inequality constraint, flat tax, proportional tax, progressive tax system, regressive tax schedule, marginal tax rate, effective tax rate, gross pay, net pay, take-home pay, paycheck, Form W-4, withholding tax, Form W-2, Form 1099, tax-deferred contribution, cafeteria plan, flexible spending account FSA, tax liability, voluntary compliance, tax return, Form 1040, Schedule 1 - Additional Income and Adjustments to Income, Schedule B - Interest and Dividend Income, standard deviation, dependent, Schedule C - Business Income, Schedule E - Supplemental Income, Publication 17: Your Federal Income Tax, tax avoidance, tax evasion, deductions, Schedule A - Itemized Deductions, tax credit, Publication 970: Tax Benefits for Education, itemized deductions, threshold</p>	
<p>Assessment Evidence</p>	
<p>Performance Tasks: A variety of end-of-the-unit assessments and activities focusing on the</p>	<p>Other Evidence:</p> <ul style="list-style-type: none"> • Warmup problems provided in each lesson

key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- “You Write the Story!” - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- “What’s the Problem?” - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- “Really? Really! Revisited” - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:

 [Assessment Example.pdf](#)

- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit introduces students to the language, mechanics, and mathematics of income taxes. Students will learn how tax worksheets can simplify tax computations and they will actually learn how to fill in an actual tax return with relevant information. The main purpose of this unit is to give students enough familiarity with how taxes work that, as laws change over time, they will continue to understand the process well into adulthood.

This unit is broken down into the following sections:

- 6.1 - Tax Tables, Worksheets, and Schedules
- 6.2 - Modeling Tax Schedules
- 6.3 - Income Statements
- 6.4 - Form 1040 - Reporting Taxable Income
- 6.5 - Reducing Your Form 1040 Tax Liability

The following vision of a learner attributes are assessed through the following summative activities:

TI3(9-12): I can formulate and investigate probing questions to further my learning.

TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.

You write the story: Students will write a paper about the difference between individual income tax, payroll taxes, and corporate income tax amounts as a percentage of the Gross Domestic Product from 1972 extrapolated through 2032. They will rationalize those difference as fair and

appropriate or not. Further, they can comment on if the projections in the data are reasonable. They should use terminology and mathematical processes from the unit in their paper.

Really? Really! Revisited: Students will study Tax Freedom Dates since the year 2000. Is there a significance to these days when we consider day of the week, or what day (out of 365) they fall on each year). Students will study a regression between the year and day of the year to look for a pattern and answer a series of followup questions. Their conclusions should be backed up by research beyond the presented information from their textbook.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at <https://www.cengage.com> that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 7 - Independent Living

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

The problems, activities, and projects inherent in studying independent living are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP3-Construct viable arguments and critique the reasoning of others.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP7-Look for and make use of structure.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-CED3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
- A-REI6-Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
- A-SSE1-Interpret expressions that represent a quantity in terms of its context.
- A-APR6-Rewrite simple rational expressions in different forms; write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system.
- F-BF1-Write a function that describes a relationship between two quantities.
- F-LE1-Distinguish between situations that can be modeled with linear functions and with exponential functions.
- F-TF7-Use inverse functions to solve trigonometric equations that arise in modeling contexts; evaluate the solutions using technology, and interpret them in terms of the context.
- G-C5-Derive using similarity the fact that the length of the arc intercepted by an angle is proportional to the radius, and define the radian measure of the angle as the constant of proportionality; derive the formula for the area of a sector.
- G-MG3-Apply geometric methods to solve design problems (e.g., designing an object or structure to satisfy physical constraints or minimize cost; working with typographic grid systems based on ratios).
- G-SRT5-Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.
- G-SRT8-Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
- G-GMD1-Give an informal argument for the formulas for the circumference of a circle, area of a circle, volume of a cylinder, pyramid, and

<p>cone. <i>Use dissection arguments, Cavalieri's principle, and informal limit arguments.</i></p> <ul style="list-style-type: none"> • S-ID6a-Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models. • S-ID6c-Fit a linear function for a scatter plot that suggests a linear association. • S-ID8-Compute (using technology) and interpret the correlation coefficient of a linear fit. 	
<p>Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)</p> <p>TCC1(9-12): I can ask purposeful, insightful questions to find a variety of innovative solutions.</p> <p>AA1(9-12): I can evaluate different approaches and justify the best pathway to success.</p>	
<p>Understandings: Students will understand that...</p> <ul style="list-style-type: none"> • For many people, a home represents the largest financial undertaking of their lives. • There are many factors that influence how and where you live and students will want to make wise, well-thought-out decisions, 	<p>Essential Questions:</p> <ul style="list-style-type: none"> • What factors come into play when buying or renting a home? • How do mortgages work? • How do you maintain a home?
<p>Students will know...</p> <ul style="list-style-type: none"> • How square footage and monthly rent are related • The signing costs of leases may vary • What to research before buying a home • Closing costs can be estimated prior to deciding whether or not to purchase a home • The advantages and disadvantages of purchasing different types of homes 	<p>Students will be able to...</p> <ul style="list-style-type: none"> • Calculate the affordability of a monthly rent • Calculate moving expenses • Compute the perimeter and the area of a polygon • Compute areas of irregular polygons • Compute volumes of rectangular solids • Compute the monthly cost of paying for a house • Create an amortization table for fixed-rate mortgages • Investigate the amortization table for an adjustable-rate mortgage • Calculate discount points for a mortgage • Determine the breakeven time for discount points • Calculate negative points • Compute the costs of purchasing a cooperative or condominium • Find missing sides of right triangles using the Pythagorean theorem • Use the converse of the Pythagorean theorem • Find the slope of a line • Create proportions for similar triangles • Find missing sides and angles of right triangles using trigonometry

Key Vocabulary:

apartment, tenant, landlord, furnished, unfurnished, lease, expires, evict, single-family home, multiple-family home, condominium, cooperative, rent-burdened square footage, application deposit, security deposit, floor plan, scale, area, congruent, perimeter, apothem, Monte Carlo method, solid, volume, British Thermal Units(BTUs), promissory note, mortgage, market value, property tax, real estate tax, assessed value, down payment, escrow, fixed-rate mortgage, adjustable-rate mortgage, foreclose, private mortgage insurance(PMI), homeowner's insurance, front-end, ratio, back-end ratio, debt-to-income ratio, balloon mortgage, interest-only mortgage, recurring costs, nonrecurring costs, closing, closing costs, earnest money deposit, attorney fee, origination fee, title, title search, points, origination points, discount points, prepaid interest, arrears, transfer tax, amortization table, initial rate, hybrid ARMs, adjustment period, initial adjustment cap, periodic rate cap, lifetime cap, mortgage points, breakeven, negative points, condominium, board of directors, maintenance fee, co-op apartment, cooperative, landominum, equity, trigonometry, legs, hypotenuse, pitch, rise, run, similar, proportion, means, extremes, angle of elevation, tangent, sine, cosine, inverse trigonometric functions, expected value

Assessment Evidence**Performance Tasks:**

A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- "You Write the Story!" - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- "What's the Problem?" - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- "Really? Really! Revisited" - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:

 [Assessment Example.pdf](#)

Other Evidence:

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit introduces students to the fact that within the next decade they will likely be in a position to purchase a home and to take on the responsibility that comes with it. They will learn about finding a place to live and what they need to know about rentals, co-ops, condominiums, or buying their own house. Measuring square footage with area formulas, calculating mortgage costs, and using trigonometry to handle home

improvements are all key topics. The main purpose of this unit is to know the ins and outs of buying and maintaining a home.

This unit is broken down into the following sections:

- 7.1 - Finding a Place to Live
- 7.2 - Repairing a Floor Plan
- 7.3 - Mortgage Application Process
- 7.4 - Purchasing a Home
- 7.5 - Mortgage Points
- 7.6 - Rentals, Condominiums, and Cooperative
- 7.7 - Home Maintenance and Improvement

The following vision of a learner attributes are assessed through the following summative activities:

TCC1(9-12): I can ask purposeful, insightful questions to find a variety of innovative solutions.

AA1(9-12): I can evaluate different approaches and justify the best pathway to success.

You write the story: Students will write a paper about the rate of homeownership since the 1960s to today. The graph provided shows this changing amount as a line graph with varied peaks and gulleys. Additionally, shaded bands indicate times when the nation was going through an economic depression. Students should look to make connections between these times of economic depression and analyze other factors that cause the increase or decrease of home ownership percentage and make predictions about what that percentage may be when they are ready to buy a home. They should use terminology and mathematical processes from the unit in their paper.

Really? Really! Revisited: Students will study weights of various buildings as a context by which to do some spiral work with proportional reasoning and unit conversion. Amongst the questions asked of students are conversions between pounds and ounces, percent increases and decreases, and setting up a proportion.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at <https://www.cengage.com> that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 8 - The Stock Market

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

The problems, activities, and key assignments in the Stock Market unit offer students opportunities to learn, explore, and use the CCSS Mathematical Practices:

- MP1-Make sense of problems and persevere in solving them.
- MP2-Reason abstractly and quantitatively.
- MP3-Construct viable arguments and critique the reasoning of others.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED1>Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.*
- A-CED2>Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-CED4-Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. *For example, rearrange Ohm's law $V = IR$ to highlight resistance R .*
- A-REI3-Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- A-SSE1-Interpret expressions that represent a quantity in terms of its context.
- N-Q1-Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
- N-Q2-Define appropriate quantities for the purpose of descriptive modeling.
- N-Q3-Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.

AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.

Understandings: Students will understand that...

- Investing can help make your money grow, and there is no limit to that amount of growth, but you also run the risk of losing your investment.
- There is a need to find a good balance between

Essential Questions:

- What are stocks?
- How is stock data presented and used to make wise investments?
- What fees and interest is involved with stock?

<p>high-risk/high-reward and low-risk/low-reward investments.</p> <ul style="list-style-type: none"> • With a strong knowledge of the stock market, cooperations, and investment strategies, you as an investor can make decisions that are based on experience, data, trends, and mathematics. 	
<p>Students will know...</p> <ul style="list-style-type: none"> • The basic vocabulary of business organizations • What information can be gleaned from a stock bar chart • What information can be gleaned from a stock candlestick chart • What it means to smooth data • The significance of stock market ticker information • The definitions of basic vocabulary of the buying and selling shares of stock • The definitions of basic vocabulary of the buying and selling shares of stock • How shareowners may split the profit of the corporation they own 	<p>Students will be able to...</p> <ul style="list-style-type: none"> • Compute financial responsibility of business ownership based on ratios and percentages • Use stock data to follow the daily progress of a corporate stock • Write spreadsheet formulas • Create a stock bar chart • Create a stock candlestick chart • Calculate simple moving averages using the arithmetic average formula and the subtraction and addition method • Graph simple moving averages with a spreadsheet • Create a scatterplot of stock closing prices • Determine the linear, quadratic, cubic, and quartic regression equations for a set of stock closing prices and use this to extrapolate a closing price for a future date • Determine the total value of a trade from ticker information • Determine trade volumes from ticker information • Interpret a scatterplot of stock closing prices • Calculate gains and losses from stock trades • Compute the fees involved in buying and selling stocks • Calculate the post-split outstanding shares and share price for a traditional or reverse split • Calculate the fractional value amount that a shareholder receives after a split • Compute dividend income • Compute the yield of a stock • Compute the interest earned on corporate bonds
<p>Key Vocabulary: capital, sole proprietorship, profit, personally liable, partnership, corporation, shares of stock, shareholders, limited liability, private cooperation, public cooperation, stock market, trades, NYSE, NASDAQ, last, open, close, high, low, volume, sales in 100s, 52-week high, 52-week low, net change, after-hours trading, securities industry, Securities and Exchange Commission(SEC), Initial Public Offering(IPO), stock chart, stock bar chart, candlestick chart, smoothing techniques, simple moving average(SMA), lagging indicators, fast-moving average, slow-moving average, crossover, Dow Jones Industrial Average (DJIA), ticker, stock symbol, ticker symbol, shares traded, trading price, directional arrow, total value of a</p>	

trade, uptick, downtick, money flow, positive money flow, negative money flow, daily money flow, net money flow, trade, portfolio, round lot, odd lot, mixed lot, capital gain, short-term capital gain, long-term capital gain, Schedule D: Capital Gains and Losses, capital loss, cost basis, amount realized, stockbroker, broker fee, discount broker, financial advisor, management fee, fiduciary, amount realized, churning, online brokerage house, full-service broker, at the market, limit order, cost basis, stock split, outstanding shares, market capitalization, traditional stock split, reverse stock split, penny stock, fractional part of a share, split-adjusted share price, dividend, dividend income, income stock, yield, growth stock, preferred stock, common stock, corporate bond, face value, par value, matures, coupon rate, mutual fund, no-load mutual fund, price-earnings ratio

Assessment Evidence

Performance Tasks:

A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- “You Write the Story!” - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- “What’s the Problem?” - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- “Really? Really! Revisited” - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:

 [Assessment Example.pdf](#)

Other Evidence:

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit introduces students to the world of investing. Students investigate different types of businesses with a focus on cooperations and their shareholders. Students learn about the procedures for buying and selling stock, the fees associated with this, and how stock tickers display information about stock prices. The unit also covers different ways of making money from stock trading. The main purpose of this unit is to provide students a basic knowledge of stock trading.

This unit is broken down into the following sections:

8.1 - Business Organization

- 8.2 - Stock Market Data
- 8.3 - Stock Market Data Charts
- 8.4 - Trends in Stock Closing Prices
- 8.5 - Stock Market Ticker
- 8.6 - Stock Transactions
- 8.7 - Stock Transaction Fees
- 8.8 - Stock Splits
- 8.9 - Stock Dividends and Bond Interest

The following vision of a learner attributes are assessed through the following summative activities:

TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.

AA4(9-12): I can create opportunities to extend my learning by remaining open-minded in any situation.

You write the story: Students will write a paper about a graphic displaying changes to the value of the stock market over a single day's time, more specifically, within a half hour time. Students will need to predict what occurred that produced that data representation shown, and rationalize the peaks and gulley within the data. They should use terminology and mathematical processes from the unit in their paper.

Really? Really! Revisited: Students will study the concepts of exponential growth as it relates to the company google. The growth of the google cooperation is large in magnitude, making its name, which is derived from googl, the number 10^{100} , quite appropriate. Students will investigate the doubling effect of a small quantity to see how exponential growth differs significantly from linear growth and answer questions relating to very large values.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at <https://www.cengage.com> that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 9 - Mathematically Modeling a Business Start-Up

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

The problems, activities, and key assignments in this unit offer students opportunities to learn, explore, and use the CCSS Mathematical Practices:

- MP1-Make sense of problems and persevere in solving them.
- MP2-Reason abstractly and quantitatively.
- MP3-Construct viable arguments and critique the reasoning of others.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED1-Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- A-CED2-Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-CED3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
- A-CED4-Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance R .
- A-REI1-Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
- A-REI2-Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
- A-REI3-Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- A-REI4b-Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as $a \pm bi$ for real numbers a and b .
- A-REI6-Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
- A-REI7-Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically. For example, find the points of intersection between the line $y = -3x$ and the circle $x^2 + y^2 = 3$.
- A-REI10-Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
- A-REI11-Explain why the x-coordinates of the points where the graphs of the equations $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find

successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

- A-REI12-Graph the solutions to a linear inequality in two variables as a half-plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
- A-SSE1-Interpret expressions that represent a quantity in terms of its context.
- F-IF1-Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$.
- F-IF4-For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- F-IF5-Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function $h(n)$ gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.
- F-IF7a-Graph linear and quadratic functions and show intercepts, maxima, and minima.
- F-IF8-Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
- S-ID6-Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
- N-Q1-Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
- N-Q2-Define appropriate quantities for the purpose of descriptive modeling.
- N-Q2-Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.
- S-ID3-Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
- S-ID4-Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages. Recognize that there are data sets for which such a procedure is not appropriate. Use calculators, spreadsheets, and tables to estimate areas under the normal curve.
- S-ID5-Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.
- S-ID6-Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
- S-ID7-Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
- S-ID8-Compute (using technology) and interpret the correlation coefficient of a linear fit.
- S-ID9-Distinguish between correlation and causation.
- S-IC1-Understand statistics as a process for making inferences about population parameters based on a random sample from that population.
- S-IC3-Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

- S-IC5-Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.
- S-CP1-Describe events as subsets of a sample space (the set of outcomes) using characteristics (or categories) of the outcomes, or as unions, intersections, or complements of other events ("or," "and," "not").
- S-CP3-Understand the conditional probability of A given B as $P(A \text{ and } B)/P(B)$, and interpret independence of A and B as saying that the conditional probability of A given B is the same as the probability of A, and the conditional probability of B given A is the same as the probability of B.
- S-IC3-Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
- S-IC4-Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.
- S-IC5-Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.
- N-CN1-Know there is a complex number i such that $i^2 = -1$, and every complex number has the form $a + bi$ with a and b real.
- N-CN7-Solve quadratic equations with real coefficients that have complex solutions.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.

CCE4(9-12): I can communicate and express my understanding in an authentic, respectful and relevant way, using the most effective mode of expression.

Understandings: Students will understand that...

- Creating a business model allows a person to use variables and examine relationships among those variables to make predictions that will help maximize profit.
- Without a model, a person can invest time, money, and effort in a business that will not be successful.

Essential Questions:

- What do I need to know to start my own business?
- How can I assure that my business is successful?

Students will know...

- The process for choosing sample subjects without bias
- Various methods used to reduce bias in experiments
- If a statistic is biased or unbiased
- The significance of the slopes of supply and demand curves
- Definitions and specific examples of fixed and variable expenses
- The definition of revenue breakeven points and how to determine them
- The transitive property of dependence as it is used by a

Students will be able to...

- Use a random number table
- Create diagrams for experimental designs
- Compute combinations
- Compute unbiased estimators
- Critique sampling techniques
- Find points of equilibrium
- Create an expense equation based on fixed and variable expenses
- Write, graph, and interpret expense and revenue functions

business owner	<ul style="list-style-type: none"> • Factor a quadratic using various methods • Determine the breakeven prices and amounts using technology or algebra • Determine a profit equation given the expense and revenue functions • Determine the maximum profit and the price at which the maximum profit is attained • Identify breakeven points and explain them in the context of a situation • Determine complex roots of a quadratic equation • Use multiple sources of information, functions, and methodologies to model a new business • Use linear programming • Write an objective function • Construct a feasible region given constraints • Maximize an objective profit function • Minimize an objective expense function
<p>Key Vocabulary: patent, trademark, bias, question-wording bias, random number table, experiment, randomization, replication, control group, placebo, experimental group, completely randomized design, matched-pairs design, observational study, hypothesis, hypothesis testing, population, sample, focus group, inferential statistics, convenience sample, replacement, combination, factorial, simple random sample(SRS), stratified random sample, undercoverage, nonresponse, unbiased estimator, widget, demand function, demand, supply, wholesale price, markup, retail price, equilibrium, variable expenses, fixed expenses, expense function, revenue, revenue function, breakeven point, nonlinear function, second-degree equation, quadratic equation, parabola, leading coefficient, minimum, vertex, maximum, axis of symmetry, roots, zeros, quadratic formula, perfect square trinomial, completing the square, zero net difference, profit, maximum profit, complex roots, complex number, imaginary unit, bankruptcy, dependance, transitive property of dependance, linear programming, optimal outcome, constraints, polygonal region, objective function, feasible region, boundless feasible region</p>	
Assessment Evidence	
<p>Performance Tasks: A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:</p> <ul style="list-style-type: none"> • Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice. • “You Write the Story!” - Activities that ask students to examine a 	<p>Other Evidence:</p> <ul style="list-style-type: none"> • Warmup problems provided in each lesson • Checks for understanding provided in each lesson • Book application problems

<p>graph or chart and write a story or article to help students sharpen their articulation skills.</p> <ul style="list-style-type: none"> • “What’s the Problem?” - Equations give students the opportunity to think backwards and create a problem using the given numbers. • “Really? Really! Revisited” - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature. <p>An example of these types of activities can be seen here:</p> <p> Assessment Example.pdf</p>	
<h3 style="text-align: center;">Learning Plan</h3>	
<p>This unit introduces students to the process to take a business idea from just a thought to a tangible, profitable operation. Students become familiar with terminology including fixed and variable expenses, supply and demand, revenue, profit, and expense functions, etc. The unit culminates with a full drawn out business model for a hypothetical business using linear programming to maximize profit and minimize costs. The main purpose of this unit is to empower students to pursue their passions in such a way to be their own boss.</p> <p>This unit is broken down into the following sections:</p> <ul style="list-style-type: none"> 9.1 - Inventions 9.2 - Market Research 9.3 - Supply and Demand 9.4 - Fixed and Variable Expenses 9.5 - Graphs of Expense and Revenue Functions 9.6 - Breakeven Analysis 9.7 - The Profit Equation 9.8 - Mathematically Modeling a Business 9.9 - Optimal Outcomes <p>The following vision of a learner attributes are assessed through the following summative activities:</p> <p>TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.</p> <p>CCE4(9-12): I can communicate and express my understanding in an authentic, respectful and relevant way, using the most effective mode of expression.</p> <p>You write the story: Students will produce a news article about data shared regarding a typical failure rate of products over time. Students will see a “bathtub curve” named so because some products fail immediately, but those that don’t have an initial defect tend to last much longer, up to</p>	

a point. Students will consider what factors affect the start, middle, and end of this type of relationship over a time period. The example provided shows a 5 year time frame, but the concept can be generalized to any duration. Students should use terminology and mathematical processes from the unit in their paper.

Really? Really! Revisited: Students will study the value of collectible cars in various conditions over time. Data from Ford Motor Company is provided for students to utilize on the value of 1958 Edsel Villager 9-Passanger Wagons. Students will determine specific values based on conditions and consider profit earned after investing in cars at various times before writing generalized equations to model the values of these cars over multiple variables. Further research on the car itself is considered an extension to this assignment.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at <https://www.cengage.com> that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 10 - Planning for Retirement

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

The problems, activities and projects inherent in studying retirement planning are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP2-Reason abstractly and quantitatively.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP8-Look for and express regularity in repeated reasoning.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED1-Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- A-CED3-Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.
- A-SSE1-Interpret expressions that represent a quantity in terms of its context.
- F-BF1-Write a function that describes a relationship between two quantities.
- F-IF7d-Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.
- F-IF8b-Use the properties of exponents to interpret expressions for exponential functions. For example, identify percent rate of change in functions such as $y = (1.02)^t$, $y = (0.97)^t$, $y = (1.01)12^t$, $y = (1.2)^{t/10}$, and classify them as representing exponential growth or decay.
- F-LE2-Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
- S-MD1-Define a random variable for a quantity of interest by assigning a numerical value to each event in a sample space; graph the corresponding probability distribution using the same graphical displays as for data distributions.
- S-MD2-Calculate the expected value of a random variable; interpret it as the mean of the probability distribution.
- S-MD4-Develop a probability distribution for a random variable defined for a sample space in which probabilities are assigned empirically; find the expected value. For example, find a current data distribution on the number of TV sets per household in the United States, and calculate the expected number of sets per household. How many TV sets would you expect to find in 100 randomly selected households?
- S-MD5-Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.

Vision of A Learner Attributes: Students will be able to independently use their learning to... ("I can" statements to be demonstrated)

CCE3(9-12): I can show initiative in prompting group discourse and fostering collaboration among others, providing actionable feedback, and working with others to solve problems and/or design products.
 TI4(9-12): I can apply my strengths and anticipate challenges to reach my current and future goals.

Understandings: Students will understand that...

- People need to start planning for retirement early in their working life so that they can afford the expenses they will still have after they stop working.
- There are retirement savings accounts, pension plans, and Social Security options for retirees.
- It is important to become knowledgeable about the pros and cons of each type of retirement plan so you are ready when you retire.

Essential Questions:

- Why and how should you save for retirement?
- What role do the government and my employer play in helping me prepare for retirement?

Students will know...

- The definition of an annuity
- The benefits that are paid by Social Security
- How social security benefits are computed
- The advantages and disadvantages of different types of life insurance
- The advantages and disadvantages of different types of investments

Students will be able to...

- Calculate future values of retirement investments that are both single deposit and periodic
- Calculate the tax savings by making contributions to pre-tax retirement savings accounts
- Calculate an employer's matching contribution to a retirement account
- Calculate annuity payouts over time
- Calculate retirement account withdrawals using a traditional or proportional approach
- Compute federal income tax on benefits that are paid under Social Security
- Calculate pension benefits using during and after vesting periods
- Compute the cost of different types of life insurance
- Integrate different investment types to create portfolios with long- or short-term goals

Key Vocabulary:

retirement, semi-retired, pre-tax dollars, after-tax investments, individual retirement account(IRA), traditional IRA, tax-deferred, Roth IRA, tax-exempt, 401(k), SEP IRA plan, SIMPLE IRA plan, 403(b), traditional withdrawal approach, proportional withdrawal approach, annuity, inheritance, beneficiaries, last will and testament, trust agreement, trust, trustor, trustee, Old-Age, Survivors, and Disability Insurance(OASDI), Social Security benefit, full retirement age, Social Security statement, Special Security credit, average indexed monthly earnings(AIME), primary

insurance amount(PIA), bend points, deferred compensation, pension, defined benefit plan, vested, Pension Benefit Guaranty Cooperation(PBGC), Employee Retirement Income Security Act(ERISA), Pension Protection Act, cost-of-living adjustment(COLA), Consumer Price Index(CPI), beneficiary, premium, actuary, mortality table, mortality rate, face value, term life insurance, group term life insurance, level term insurance, decreasing term insurance, increasing term insurance, permanent life insurance, whole life insurance, cash value, universal life insurance, variable life insurance, greater integer function, expected value, diversify, volatility, aggressive investment, conservative investment, liquidity, speculative stock, cryptocurrency, blockchain technology, bitcoin, satoshi

Assessment Evidence

Performance Tasks:

A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- “You Write the Story!” - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- “What’s the Problem?” - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- “Really? Really! Revisited” - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:

 [Assessment Example.pdf](#)

Other Evidence:

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit introduces students to the idea that it is never too early to start planning for retirement. Students will be introduced to various employer provided pensions and retirement savings plans. Life insurance is detailed as a way to provide financial security in the event of a loss. The main purpose of this unit is to give students the skills to create an investment portfolio that blends risk and duration(long-term and short-term) to personalize their savings retirement plan.

This unit is broken down into the following sections:

10.1 - Retirement Income from Savings

10.2 - Social Security Benefits

- 10.3 - Pensions
- 10.4 - Life Insurance
- 10.5 - Investment Diversification

The following vision of a learner attributes are assessed through the following summative activities:

CCE3(9-12): I can show initiative in prompting group discourse and fostering collaboration among others, providing actionable feedback, and working with others to solve problems and/or design products.

TI4(9-12): I can apply my strengths and anticipate challenges to reach my current and future goals.

You write the story: Students will produce a news article about the change in both age and gender in the work force from 1950 through projected data for the year 2050. Students will discuss how this change relates to social factors, what the implications are, and what it tells us moving forward. Students should use terminology and mathematical processes from the unit in their paper.

Really? Really! Revisited: Students will study the data from the U.S. Census Bureau about the number of people who are 65 and over, 85 and over, and 100 and over from 2016 projected out to 2060. Since average life span is important when thinking about retirement, it is valuable for students to extrapolate how old they can expect to live until so they can budget their retirement between when they stop working through the rest of their life. Followup questions after an analysis of this data include a graph and regression of average life span.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at <https://www.cengage.com> that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets

Unit 11 - Preparing a Budget

Desired Results - Goals, Transfer, Meaning, Acquisition

Established Goals:

The problems, activities, and projects inherent in studying budgeting are a natural forum for all eight CCSS Mathematical Practice standards, but this unit highlights:

- MP1-Make sense of problems and persevere in solving them.
- MP2-Reason abstractly and quantitatively.
- MP4-Model with mathematics.
- MP5-Use appropriate tools strategically.
- MP6-Attend to precision.
- MP8-Look for and express regularity in repeated reasoning.

Common Core State Standards for Mathematical Content that are Addressed

- A-CED1-Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear and quadratic functions, and simple rational and exponential functions.*
- A-REI10-Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
- A-SSE1-Interpret expressions that represent a quantity in terms of its context.
- F-IF4-For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- F-IF5-Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function $h(n)$ gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.
- F-IF7a-Graph linear and quadratic functions and show intercepts, maxima, and minima.
- F-IF7b-Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.
- F-IF7d-Graph rational functions, identifying zeros and asymptotes when suitable factorizations are available, and showing end behavior.
- N-Q1-Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.
- N-Q2-Define appropriate quantities for the purpose of descriptive modeling.
- N-VM6-Use matrices to represent and manipulate data, e.g., to represent payoffs or incidence relationships in a network.
- N-VM7-Multiply matrices by scalars to produce new matrices, e.g., as when all of the payoffs in a game are doubled.
- N-VM8-Add, subtract, and multiply matrices of appropriate dimensions.
- N-VM9-Understand that, unlike multiplication of numbers, matrix multiplication for square matrices is not a commutative operation, but still

<p>satisfies the associative and distributive properties.</p> <ul style="list-style-type: none"> N-VM10-Understand that the zero and identity matrices play a role in matrix addition and multiplication similar to the role of 0 and 1 in the real numbers. The determinant of a square matrix is nonzero if and only if the matrix has a multiplicative inverse. 	
<p>Vision of A Learner Attributes: Students will be able to independently use their learning to... (“I can” statements to be demonstrated)</p> <p>TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.</p> <p>AA1(9-12): I can evaluate different approaches and justify the best pathway to success.</p>	
<p>Understandings: Students will understand that...</p> <ul style="list-style-type: none"> Budgeting provides a clear picture of how much you are spending and what you are spending it on. Whether you are planning for just yourself, or for an entire family, a solid budget makes both sense and cents. 	<p>Essential Questions:</p> <ul style="list-style-type: none"> How do you organize all your expenses so you can spend accordingly? How do you plan for expenses, reduce debt, and grow savings using a budget?
<p>Students will know...</p> <ul style="list-style-type: none"> The aspects of different plans for electronic services to make an informed decision about which to choose Various methods to visualize and interpret a budget using a circle graph, line graph, bar graph, and a budget line graph 	<p>Students will be able to...</p> <ul style="list-style-type: none"> Compute the cost of electricity, gas, oil, and water for your home Compute the cost of using specific appliances for specific lengths of time Compute the time it takes an energy-saving appliance to pay for itself Compute the cost of cell phones, internet services, and cable television Set up, graph, and interpret an average cost function Create and use a budget check-off chart Develop and interpret a cash flow chart, frequency budget plan, and a year-long expense budget plan Determine the dimensions of a matrix Add, subtract, and multiply matrices Multiply a matrix by a scalar
<p>Key Vocabulary: utilities, meter, watts, kilowatt-hour(kWh), cubic foot, volume, ccf, therms, electronic utilities, budget chart, budget check-off chart, circle graph, line graph, bar graph, budget line graph, sectors, central angles, cash flow, cash flow analysis, 50-30-20 rule, emergency fund, prorate, envelope accounting system, frequency budget plan, year-long expense budget plan, net worth, assets, liabilities, debt reduction plan, debt-to-income ratio, array, rectangular array, matrix, budget matrix, dimensions,, entry, element, zero matrix, corresponding elements, scalar, scalar multiplication</p>	
<p style="text-align: center;">Assessment Evidence</p>	
<p>Performance Tasks:</p>	<p>Other Evidence:</p>

A variety of end-of-the-unit assessments and activities focusing on the key concepts will be used to determine competency of the unit material. These include:

- Projects - Encourages students to leave the classroom and reinforce concepts with real-world practice.
- “You Write the Story!” - Activities that ask students to examine a graph or chart and write a story or article to help students sharpen their articulation skills.
- “What’s the Problem?” - Equations give students the opportunity to think backwards and create a problem using the given numbers.
- “Really? Really! Revisited” - Continues the theme of the Really? Really! Feature at the beginning of each unit using math to solve a problem related to the feature.

An example of these types of activities can be seen here:

 [Assessment Example.pdf](#)

- Warmup problems provided in each lesson
- Checks for understanding provided in each lesson
- Book application problems

Learning Plan

This unit culminates all the learning into this course. It is fitting that the study of budgets ends the course because all the budget categories were studied throughout the year. Students explored household expenses and how to interpret, construct, use, and modify various types of budgets. These budgets help students control cash flow and debt reduction. The main purpose of this unit is to tie together all the aspects of financial planning discussed in this course.

This unit is broken down into the following sections:

- 11.1 - Utility Expenses
- 11.2 - Electronic Utilities
- 11.3 - Charting a Budget
- 11.4 - Cash Flow and Budgeting
- 11.5 - Budget Matrices

The following vision of a learner attributes are assessed through the following summative activities:

TCC4(9-12): I can integrate my learning to adapt to experiences in the classroom, career and life.

AA1(9-12): I can evaluate different approaches and justify the best pathway to success.

You write the story: Students will produce a news article about an infographic representing the balance of a budget over the course of a year. Analyzing a budget over the course of a full year is important since there are certain yearly expenses that cost more or less and repeat each year, such as holiday shopping or the cost to cool a home in the middle of summer. Students will write an article explaining the ramifications of considering a whole year for a budget and how this can help navigate times when one's budget seems to be abundant or diminishing. Students should use terminology and mathematical processes from the unit in their paper.

Really? Really! Revisited: Students will study the production of money. How is money produced, why can't we simply produce endless amounts of it, what backs it, and what can cause financial collapse? An array of questions and research done regarding the Bureau of Engraving and Printing will serve as the backbone for this project relating to the inherent value that is placed on physical currency.

Teacher Resources:

- Textbook: Financial Algebra: Advanced Algebra with Financial Applications, Gerver and Sgroi, Third Edition (2026)
- Online resources provided at <https://www.cengage.com> that include lesson plans, power points, answer keys, supplemental practice, assessments, and key graphics and spreadsheets