Los Angeles Unified School District
Division of Instruction
Financial Algebra 1

Unit 1 Discretionary Expenses

- **1-1 Discretionary and Essential Expenses -** measures of central tendency, frequency distributions
- **1-2 Travel Expenses -** cumulative and relative frequency, percentiles, spreadsheets
- **1-5 Personal Expenses -** scatter plots, correlation, linear regression

Unit 2 The Stock Market

- **8-1 Business Organization**—ratio and proportion
- **8-2 Stock Market Data**—percent increase, signed numbers, spreadsheets
- **8-3 Stock Market Data Charts**--graphing
- **8-4 Trends in Stock Closing Prices**—mean and regression analysis
- **8-5 Stock Market Ticker**—mean, literal equations
- **8-6 Stock Transactions**—percent commission, literal equations, mean
- **8-7 Stock Transaction Fees**—signed numbers, literal equations
- **8-8 Stock Splits**—proportions, spreadsheets
- **8-9 Dividend Income**—converting fractions to equivalent percents, literal equations, spreadsheets

Unit 3 Modeling A Business

- **9-1 Inventions**—sampling, experimental bias, experimental design
- **9-2 Market Research —** sampling techniques, unbiased estimators
- **9-3 Supply and Demand -** supply and demand system, equilibrium point, modeling demand using linear regression
- **9-4 Fixed and Variable Expenses -** literal equations, evaluating functions, expressing a function in terms of another variable, solving a system of linear equations algebraically
- **9-5 Graphs of Expense and Revenue Functions -** quadratic equation, parabola, axis of symmetry, intercepts, graphing a quadratic linear system of equations
- **9-6 Breakeven Analysis -** quadratic formula, breakeven points, literal equations, spreadsheets
- **9-7 The Profit Equation -** quadratic/linear system of equations, maximum point of a parabola, interpreting profit, revenue, expense graphs
- **9-8 Mathematically Modeling a Business -** transitive property of dependence, modeling profit, revenue, expense

Unit 4 Banking

- **2-1 Checking Accounts -** basic operations, literal equations, extensions
- **2-2 Reconcile a Bank Statement -** basic operations, literal equations, inequalities
- **2-3 Savings Accounts -** simple interest formula, ordering fractions/decimals, literal equations, spreadsheets, arithmetic sequences
- **2-4 Explore Compound Interest -** compound interest calendar, iteration

Unit 5 Employment

- **5-1 Look For Employment**—piecewise functions, percent decrease,
- **5-2 Pay Periods and Hourly Rates**—literal equations, rational functions, spreadsheets
- **5-3 Commissions, Royalties, and Piecework Pay**—commission, piecewise functions
- **5-4 Employee Benefits**--literal equations, measures of central tendency
- **5-5 Social Security and Medicare**--slope, graphs with cusps, piecewise functions, discontinuities

Unit 6 Consumer Credit

- **3-1 Introduction to Credit**—down payments, monthly payments, credit scores, spreadsheets
- **3-2 Loans**—monthly payment formula substitution, monthly payment tables, ordering percents, decimals, and fractions, converting fractions to equivalent decimals
- **3-3 Student Loans -** interest capitalization, simplified daily interest, monthly payment formula
- **3-4 Loan Calculations and Regression—**logarithms as inverse calculator operations to find exponents, cubic regression, scatterplots
- **3-5 Credit Cards**--literal equations, percent, finance charges
- **3-6 Credit Card Statement**—finance charges, interpreting statements
- **3-7 Average Daily Balance**—computing average daily balance

Unit 7 Independent Living

- **7-1 Find a Place to Live**—systems of equations
- **7-2 Read a Floor Plan**—area, perimeter, volume, subtraction of areas, apothem, Monte Carlo method
- **7-3 Mortgage Application Process**—monthly payment formula substitution, literal equations
- **7-4 Purchase a Home**—interest, spreadsheets
- **7-5 Mortgage Points -** discount points, breakeven date, negative
- **7-6 Rentals, Condominiums, and Cooperatives**— spreadsheets, scatterplots, regression
- **7-7 Home Maintenance and Improvement -** Pythagorean Theorem, trigonometry.

Unit 1: DISCRETIONARY EXPENSES (10 - 15 days)

Often, most of a teenager's expenses are discretionary expenses. Students often do not have the responsibility of essential expenses, especially at a younger age. 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, MP2, MP4, MP3, MP4, MP5, MP6, and MP8.

Common Core State Standards for Mathematical Content that are Addressed

F-IF7a, F-IF8
S-ID1, S-ID2, S-ID4, S-ID6, S-ID7, S-ID8, S-ID9
N-Q1, N-Q2, N-Q3

Financial Algebra 2nd Edition	Section Learning Objectives
1-1	After completing this section, students should be able to: • differentiate between essential and discretionary expenses • determine the mean of a data set. • determine the median of a data set, • determine the mode of a data set. • use sigma notation to represent the mean of a data set. • create an interprets a frequency distribution table. • determine the mean, median, and mode of a data set presented as a frequency distribution table.
1-2	After completing this section, students should be able to: • determine and interpret cumulative frequency. • determine and interpret relative frequency. • determine and interpret relative cumulative frequency. • model a distribution using a spreadsheet. • determine and interpret percentiles.
1-5	After completing this section, students should be able to: • state the difference between univariate and bivariate data. • Interpret trends based in bivariate data. • construct a scatter plot. • fit a linear regression line to a scatterplot. • find the equation of a linear regression line. • compute and interpret the correlation coefficient. • use extrapolation and interpolation to make predictions based on regression lines.

Unit 2: THE STOCK MARKET (25 - 30 days)

Students are often intrigued by the investment world. Many of them will end up working for a business and this section allows them to learn about different types of business organizations. The section uses algebra and graphs to explore how businesses raise capital through stock sales and how stock trades and dividends allow investors to make money. The problems, activities, and key assignments in the Stock Market unit offer students opportunities to learn, explore, and use the CCSS Mathematical Practices MP1, MP2, MP3, MP4, MP5, MP6.

Common Core State Standards for Mathematical Content that are Addressed

A-CED1, A-CED2, A-CED4,
A-REI3
A-SSE1
N-Q1, N-Q2, N-Q3

Financial Algebra 2nd Edition	Section Learning Objectives
8-1	After completing this section, students should be able to: • understand the basic vocabulary of business organizations • express parts of a whole as ratios • compute financial responsibility of business ownership based on ratio and proportion
8-2	After completing this section, students should be able to: • use stock data to follow the daily progress of a corporate stock. • use net change to compute closing prices. • use closing prices to compute net change. • compute the volume of shares traded from a stock table. • express net changes as percents of closing prices. • create spreadsheet formulas to model stock share progress.
8-3	After completing this section, students should be able to: • interpret a stock bar chart. • create a stock bar chart. • interpret a stock candlestick chart • create a stock candlestick chart. • compute net changes from bar charts and candlestick charts.
8-4	After completing this section, students should be able to: • understand how data is smoothed. • calculate simple moving averages using the arithmetic average formula. • calculate simple moving averages using the subtraction and addition method. • graph simple moving averages using a spreadsheet.
8-5	After completing this section, students should be able to: • interpret stock market ticker displays. • determine the value of a trade form ticker output. • determine trade volumes from ticker displays.
8-6	After completing this section, students should be able to: • understand the basic vocabulary of buying and selling shares of stock. • compute gross capital gains and losses from stock trades. • express capital gain as a percent of purchase price.

8-7	After completing this section, students should be able to: • compute the fees involved in buying and selling stocks. • compare percent commissions to flat fees. • understand the basic vocabulary of stock trading.
8-8	After completing this section, students should be able to: • calculate the post-split outstanding shares and share price for a traditional split. • calculate the post-split outstanding shares and share price for a reverse split. • calculate the fractional value amount that a shareholder receives after a split.
8-9	After completing this section, students should be able to: • understand the concept of shareowners splitting the profit of a corporation they own. • compute dividend income. • compute the yield for a given stock. • model yield computations algebraically. • compute yields after stock splits. • compute the interest earned on corporate bonds.

Financial Algebra Course 1
Unit 3: MODELING A BUSINESS (30 - 35 days)

Students are introduced to basic business organization terminology in order to read, interpret, chart and algebraically model ownership, production, and sales data. Statistical analysis plays a very important role in the modeling of a business. Using linear, quadratic, and regression equations in that process assists students in getting a complete picture of supply, demand, expense, revenue, and profit as they model the production of a new product. The problems, activities, and key assignments in this unit offer students opportunities to learn, explore, and use the CCSS Mathematical Practices MP1, MP2, MP3, MP4, MP5.

Common Core State Standards for Mathematical Content that are Addressed
A-CED1, A-CED2, A-CED3, A-CED4
A-REI2, A-REI3, A-REI4b, A-REI6, A-REI7, A-REI10, A-REI11, A-REI12
A-SSE1
F-IE4
F-IF1, F-IF4, F-IF5, F-IF7a, F-IF8, S-ID6
N-Q1, N-Q2, N-Q3, N-CN
S-ID8, S-ID9, S-IC1, S-IC3, S-IC5

Financial Algebra 2nd Edition	Section Learning Objectives
9-1	After completing this section, students should be able to: • describe how to choose samples without bias. • use a random number table. • create diagrams for experimental designs.
9-2	After completing this section, students should be able to: • compute combinations. • Compute unbiased estimators. • Critique sampling techniques.
9-3	After completing this section, students should be able to: • calculate a retail price after a markup. • interpret the graph of a supply and demand system of equations. • given bivariate data in the form of (price, demand), determine the linear regression demand function that models the data.
9-4	After completing this section, students should be able to: • represent expenses as a function of quantity produced. • determine average cost. • given a demand function expressed in terms of price, *p*, and expense function expressed in terms of demand, write the expense function in terms of price. • determine the breakeven point for a revenue and expense function both graphically and algebraically.
9-5	After completing this section, students should be able to: • create a linear expense function. • graph a linear expense function. • create a revenue function as the product of the price and quantity demanded. • graph a revenue function. • interpret the graph of a revenue function. • interpret the zeros of a revenue function.

	• interpret the breakeven points of a revenue function.
9-6	After completing this section, students should be able to: • determine breakeven points using the quadratic formula. • evaluate revenue and expense at breakeven points. • set up and use a spreadsheet to determine breakeven points.
9-7	After completing this section, students should be able to: • determine the quadratic profit equation given a linear expense equation and a quadratic revenue equation. • determine the maximum point of a quadratic equation. • use the axis of symmetry to determine the maximum point of a quadratic profit equation. • interpret the maximum point of a quadratic profit equation.
9-8	After completing this section, students should be able to: • determine the expense E for production of an item when the price p , expense equation, and demand equation are given. • create a summary analysis of a business model.

Financial Algebra Course 1
Unit 4: BANKING SERVICES (15 - 20 days)

In this unit, students examine the simple interest formula, and basic banking and checking services. They use the simple interest formula and calendars to get an intuitive feel for the concept of compound interest. (Compound interest is approached in great depth in Financial Algebra Course 2). They derive formulas and use iteration to compute compound interest. 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, MP4, MP5, MP6, and MP8.

Common Core State Standards for Mathematical Content that are Addressed
A-CED4
A-SSE1a, A-SSE1b, A-SSE3
F-IF4, F-IF8b
F-BF1a, 2, 5
N-RN1, N-RN2

Financial Algebra 2nd Edition	Section Learning Objectives
2-1	After completing this section, students should be able to: • make checking account transactions. • determine the balance in a check register.
2-2	After completing this section, students should be able to: • reconcile a bank statement and a check register. • model the reconciliation process using variables. • reconcile a bank statement and check register using a spreadsheet.
2-3	After completing this section, students should be able to: • write the general form for an arithmetic sequence. • find the common difference in an arithmetic sequence. • order percentages. • make savings account calculations. • use the simple interest formula to find the interest given the principal, rate, and time. • use the simple interest formula to find the principal given the interest, rate, and time. • use the simple interest formula to find the time given the principal, rate, and interest. • use the simple interest formula to find the rate given the principal, interest, and time.
2-4	After completing this section, students should be able to: • apply the compound interest formula. • explore annual, semiannual, quarterly, monthly, and daily iteration using the simple interest formula.

Financial Algebra Course 1
Unit 5: EMPLOYMENT (15 - 20 days)

High school students are on the brink of joining the labor force, even if on a part-time, after school, or summer level. They need to fully understand the nuances of finding a job, salaries, labor laws, paystub deductions, and benefits. (Income Taxes are covered in great depth in Financial Algebra Course 2). 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, MP4, MP5, MP6, MP7, and MP8.

Common Core State Standards for Mathematical Content that are Addressed

A-CED1, A-CED2, A-CED4
A-REI3
F-IF2, F-IF4, F-IF7b, F-BF1, F-LE1

Financial Algebra 2nd Edition	Section Learning Objectives
5-1	After completing this section, students should be able to: • compute periodic salary based on annual contract salary. • compute employment agency fees. • interpret abbreviations in classified ads. • express classified ad prices as piecewise functions.
5-2	After completing this section, students should be able to: • compute weekly, semimonthly, and biweekly earnings given annual salary. • compute hourly pay. • compute overtime pay at different overtime rates. • model payment procedures algebraically. • compute hourly rates from total paycheck that include overtime.
5-3	After completing this section, students should be able to: • compute pay based on percent commission. • compute piecework pay. • model payment procedures algebraically. • understand advantages and disadvantages of incentive-based pay.
5-4	After completing this section, students should be able to: • understand the value of pensions and health care insurance, stock ownership plans, paid vacations, and child care. • model vacation time using linear functions. • compute the costs of purchasing employee benefits. • understand unemployment insurance. • Compute final average salaries for pensions. • compute pensions.
5-5	After completing this section, students should be able to: • compute paycheck deductions for Social Security. • express Social Security payments as piecewise functions. • compute paycheck deductions for Medicare. • compute historical trends in Social Security deductions. • graph Social Security deduction functions. • find coordinates of cusps in Social Security graphs. • compute excess Social Security taxes paid.

Financial Algebra Course 1
Unit 6: CONSUMER CREDIT (20 - 25 days)

Using credit is a tremendous responsibility. Students need to learn all of the requirements and regulations involving loans and credit cards. Unit 5 examines loans, credit legislation, debtors and creditor responsibilities, and reading a credit card statement. 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, MP2, MP4, MP3, MP4, MP5, MP6, and MP8.

Common Core State Standards for Mathematical Content that are Addressed

A-SSE1, A-SSe1b, A-SSE2, A-SSE3, A-SSE3c, A-CED3
F-BF1a, F-IF8b, F-LE5
N-Q1, N-Q2
S-ID6a

Financial Algebra 2nd Edition	Section Learning Objectives
3-1	After completing this section, students should be able to: • understand the basic vocabulary necessary to use credit responsibly. • identify different types of lending institutions. • compute how long it takes to save for items when credit is not used. • compute finance charges for installment purchases. • understand layaway plan fees. • understand deferred payment plans. • understand credit scores • compute how credit scores can affect the cost of credit.
3-2	After completing this section, students should be able to: • compute monthly payment s using a monthly payment table. • compute monthly payments using the monthly payment formula. • compute finance charges on loans. • model finance charges algebraically.
3-3	After completing this section, students should be able to: • explain options available for student loans. • calculate interest on a student loan. • apply the simplified daily interest formula.
3-4	After completing this section, students should be able to: • model loan payments • understand how monthly payments are partially interest and partially payments towards principle. • use natural logarithms to compute loan lengths. • use quadratic and cubic regression to fit scatterplots to curves.
3-5	After completing this section, students should be able to: • understand the vocabulary of credit card usage. • compute liabilities under the Truth in Lending Act. • compute monthly interest rates based on APR. • compute the average daily balance on a credit card. • model average daily balances algebraically. • understand credit legislation.
3-6	After completing this section, students should be able to:

	• verify entries on a credit card statement. • understand the Schumer Box. • understand how interest accumulates when only the minimum payment is paid monthly.
3-7	After completing this section, students should be able to: • create an average daily balance calendar based on interpreting a credit card statement. • understand how purchases at different points in the billing cycle affect average daily balance. • compute average daily balance. • find errors in credit card statements. • calculate and/or verify finance charges on a credit card statement.

Financial Algebra Course 1
Unit 7: INDEPENDENT LIVING (20 - 25 days)

Most students do not have a full grasp of the big picture when it comes to the financial demands of "moving out." There are so many expenses involved in purchasing and maintaining a home, or renting an apartment. Students will examine all of the expenses that comprise independent living. 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, MP4, MP3, MP4, MP5, MP6, and MP7.

Common Core State Standards for Mathematical Content that are Addressed

A-CED2, A-CED3, A-REI6, A-SSE1, A-APR6
F-BF1, F-LE1
G-C5, G-MG3
S-ID6a, S-ID6c, S-ID8

Financial Algebra 2nd Edition	Section Learning Objectives
7-1	After completing this section, students should be able to: • calculate the affordability of monthly rent. • use regression to determine the relationship between square footage and monthly rent. • determine lease signing costs. • calculate and compare moving expenses. • use simultaneous equations to model moving costs.
7-2	After completing this section, students should be able to: • compute the perimeter of a polygon. • compute the area of a regular polygon using its apothem. • convert scale drawing measurements to actual measurements. • use subtraction of areas to find the areas of irregular regions. • use probability and the Monte Carlo Method to compute the area of irregular regions. • compute volumes of rectangular solids. • use volume to compute BTU requirements for air-conditioning.
7-3	After completing this section, students should be able to: • understand the vocabulary used in mortgages and promissory notes. • compute front-end ratios • compute back-end ratios • compute balloon payments. • compute monthly payment using the monthly payment formula. • compute the total interest on a home purchase. • compute property taxes based on square footage and assessed value.
7-4	After completing this section, students should be able to: • understand the vocabulary of closing on a home. • estimate closing costs. • create an amortization table for a fixed mortgage. • investigate amortization tables for adjustable rate mortgages.
7-5	After completing this section, students should be able to: • calculate the discount points for a mortgage. • determine the breakeven time for discount points.

	• calculate negative points.
7-6	After completing this section, students should be able to: • understand the difference between cooperatives and condominiums. • compute the costs of purchasing a cooperative or condominium.
7-7	After completing this section, students should be able to: • find missing sides of right triangles using the Pythagorean Theorem. • Find missing sides and angles of right triangles using trigonometry.