



Manhattan Center for Science and Math High School

Mathematics Department Curriculum

Content/Discipline    **Financial Algebra Term 1**

<http://mcsportal.net>

Marking Period 1

Topic and Essential Question

**Unit 1** – (1) How do business start? (2) What stock market data is available on a daily basis? (3) How can stock data be smoothed? (4) How is stock market data transmitted to the investor? (5) What is a stock portfolio? (6) How do we buy and sell stocks? (7) How and why do corporations split stocks?

**Unit 2** – (1) How do scatterplot display trends? (2) How do manufactures decide the quantity of a product they will produce? (3) What expenses are involved in the manufacturing process? (4) How can expense and revenue be graphed? (5) What happens when revenue equals expense? (6) How do revenue and expense contribute to profit calculation?

Unit/Topics            **Unit 1** – Business Organization

**Unit 2** – Modeling a Business

SWBAT/Objectives    Content (“Know”):

**Unit 1**

1. Students will be able to understand how data is smoothed
2. Student will be able to understand stock market data
3. Students will be able to understand stock market ticker information
4. Students will be able to understand a stock portfolio

**Unit 2**

1. Students will be able to understand demand curves
2. Students will be able to understand supply curves
3. Students will be able to understand points of equilibrium
4. Students will be able to understand the difference between fixed and variable expenses
5. Students will be able to understand profit functions
6. Students will be able to understand breakeven points

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## Skills (“Do”):

### Unit 1

1. Students will be able to compute financial responsible of business ownership based on ratios and percents.
2. Students will be able to use stock data to follow the daily progress of a corporate stock
3. Students will be able to calculate simple moving averages
4. Students will be able to compute gains and losses from stock trades
5. Students will be able to compute the fees involved in buying and selling stocks
6. Students will be able to calculate the post-split outstanding shares and share price for a traditional split and a reverse split
7. Students will be able to compute dividend income, yield for a given stock, and the interest earned on corporate bonds

### Unit 2

7. Students will be able to graph bivariate data
8. Students will be able to interpret and analyze trends based on scatterplots
9. Students will be able to create an expense equation based on fixed and variable expenses
10. Students will be able to write, graph, and interpret the expense and revenue functions
11. Students will be able to determine a profit equation given the expense and revenue equations
12. Student will be able to use multiple pieces of information, equations, and methodologies to model a new business

### **Vocabulary/Key Terms**

**Unit 1** - capital, sole proprietorship, profit, personally liable, partnership, corporation, shares of stock, shareholders, limited liability, public corporation, stock market, trades, NYSE, NASDAQ, last, close, high, low, volume, sales in 100s, 52-week high, 52-week low, net change, after-hours trading, smoothing techniques, simple moving average (SMA), fast moving average, crossover, ticker, stock symbol, ticker symbol, trading volume, trading price, total value of a trade, portfolio, trade, gross capital gain, gross capital loss, stock split, market capitalization or market cap, traditional stock, outstanding shares, reverse stock split, fractional part of a share, dividend, dividend income, income stock, yield

**Unit 2** - scatterplot, correlation, positive correlation, negative correlation, causal relationship, explanatory variable, response variable, demand function, demand, supply, equilibrium, markup, wholesale price, retail price, variable expenses, fixed expenses, revenue, revenue equation, profit, loss, breakeven point, nonlinear function, parabola, vertex of a parabola, second-degree equation, leading coefficient, axis of symmetry, quadratic equation, maximum value, profit

### **Assessments:**

Uniform Test/Quiz  
Classwork  
Homework

### **Common Core Standards:**

**Unit 1** - A-CED1, A-CED2, A-REI3, N-Q1, N-Q2, N-Q3, A-SSE1  
**Unit 2** - N-Q2, N-Q3, S-ID9, A-CED2, F-IF1, F-IF4, F-IF5, F-IF7a, F-IF8, S-ID6, S-ID8, A-REI4b, A-REI7, A-REI10, A-REI11

**Differentiated Instruction:**

- Flexible grouping
- Cooperative Learning
- Visual Learning – SMART Board, White board
- Visual and interactive questions using the Smart board
- Students have an option to view additional videos, tutorials, interactive practice problems online

**ELLs:**

*English Language Learners* are paired with students who are fluent in English, and given extra time. Vocabulary is pronounced several times and accompanied by alternative words or phrases that are simplified. Visual aids, including pictures, Smartboards, and manipulatives, help students make clear connections to the text.

**SWDs:**

*Students with Special Needs* are grouped with helpers and given instructions or assessments with simplified language or extra time. Color-coding on the Smartboard help illustrate steps required to solve a problem. Hands-on activities are provided to help construct student learning.

**High-Achievers:**

*Gifted/Honor students* are given challenge problems during lessons, homework, and summative assessments, which earn extra credits. They are expected to complete the whole worksheet, and are given challenge (e.g. open-ended) problems that develop higher-level thinking.

**Resources/Books**

Advanced Algebra with Financial Applications by Robert Gerver and Richard Sgroi  
Class website

Homework: Per Teacher



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Marking Period 2

Topic and Essential Question

**Unit 3** – (1) How do people gain access to money they keep in the bank? (2) What types of savings accounts do banks offer customers? (3) What is compound interest? (4) What are the advantages of using the compound interest formula? (5) How can interest be compounded continuously? (6) How can we effectively plan for the future balance in an account? (7) How can we determine what we need to invest now to reach a future goal?

**Unit 4** – (1) What do we need to know before using credit? (2) What information do we need to know before taking out a loan? (3) How can you calculate and model loan computations? (4) What do we need to know to use credit cards? (5) What information does a credit card statement give us? (6) How are the entries on the monthly statement calculated?

Unit/Topics

**Unit 3** – Banking Services

**Unit 4** – Consumer Credit

SWBAT/Objectives

Content (“Know”):

**Unit 3**

5. Students will be able to understand how checking accounts work
6. Students will be able to understand basic vocabulary of savings accounts
7. Students will be able to understand the concept of getting interest on your interest
8. Students will be able to understand the derivation of the compound interest formula
9. Students will be able to understand continuous compound interest

**Unit 4**

10. Students will be able to understand the basic vocabulary of credit terms
11. Students will be able to understand the different types of lending institutions
12. Students will be able to understand loans and monthly payments
13. Students will be able to understand basic vocabulary of credit cards
14. Students will be able to understand credit card statements

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## Skills (“Do”):

### Unit 3

8. Students will be able to complete a checking register
9. Students will be able to compute simple interest using the simple interest formula
10. Students will be able to compute compound interest using a table
11. Students will be able to make computations using the compound interest formula
12. Students will be able to compute interest on an account that is continuously compounded
13. Students will be able to calculate the future value of a periodic deposit investment
14. Students will be able to graph the future value function

### Unit 4

15. Students will be able to compute finance charges for installment purchases
16. Students will be able to compute monthly payments using a formula
17. Students will be able to compute finance charges on loans
18. Students will be able to calculate monthly loan balance
19. Students will be able to calculate how long it would take to pay off a given loan
20. Students will be able to compute an average daily balance

### **Vocabulary/Key Terms**

**Unit 3** - checking accounts, payee, deposit slip, direct deposit, hold, overdraft protection, ATM, PIN, interest, maintenance fee, joint account, debit, credit, check register, savings account, simple interest, simple interest formula, statement savings, minimum balance, interest, interest rate, principal, compound interest, quarterly compounding, daily compounding, annual compounding, annual percentage rate (APR), future value of a single deposit investment, periodic investment, future value of a periodic deposit investment, biweekly

**Unit 4** - credit, debtor, creditor, asset, earning power, credit rating, credit reporting agency, installment plan, down-payment, interest, finance charge, promissory note, principal, annual percentage rate, cosigner, life insurance, prepayment privilege, prepayment penalty, monthly payment calculator, natural logarithm, credit card, debit card, impulse buying, Truth-in-Lending-Act, billing cycle, credit card statement, account number, credit line, available credit, billing date, payment due date, transactions, purchases late charge, new balance, minimum payment

### **Assessments:**

Uniform Test/Quiz  
Classwork  
Homework

### **Common Core Standards:**

**Unit 3** - A-SSE1, A-SSE1a, A-SSE1b, A-SSE3, F-BF1a, A-CED4, A-SSE3c, F-IF8b, N-RN1, N-RN2  
**Unit 4** - A-SSE1, A-SSE3, A-CED3, F-BF1a, S-ID6a, N-Q1, N-Q2

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Marking Period 3

**Topic and Essential Question**

**Unit 5** – (1) How do people in different stages of their careers find employment? (2) What do you need to know to make sure each paycheck is correct? (3) What jobs base their pay according to the amount produced? (4) What are the benefits of a job? (5) What are social security and Medicare?

**Unit 6** – (1) How do buyers and sellers use classified ads for automobiles? (2) How can statistics help you negotiate the sale or purchase of a car? (3) Why are graphs used so frequently in mathematics, and in daily life? (4) Why is having auto insurance so important? (5) What is the value of your car? (6) How does your car lose its value? (7) What data is important to a driver? (8) How can you use mathematics to become a safer driver? (9) What data might a car leave behind at the scene of an accident?

Unit/Topics

**Unit 5** – Employment Basics

**Unit 6** – Automobile Ownership

SWBAT/Objectives

Content (“Know”):

**Unit 5**

15. Students will be able to understand the advantages and disadvantages of pay based on production
16. Students will be able to understand the value of certain employee benefits
17. Students will be able to understand the benefits of a job
18. Students will be able to understand social security and Medicare

**Unit 6**

19. Students will be able to understand auto insurance coverage
20. Students will be able to understand insurance cost
21. Students will be able to understand payments on insurance claims
22. Students will be able to understand car depreciation
23. Students will be able to understand the English Standard and Metric Systems

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## Skills (“Do”):

### Unit 5

21. Students will be able to compute periodic salary based on annual contract salary
22. Students will be able to express classified ad prices as piecewise functions
23. Students will be able to compute weekly, semimonthly, and biweekly earnings given annual salary
24. Students will be able to compute hourly pay and overtime pay given hourly rate
25. Students will be able to compute pay based on percent commission
26. Students will be able to compute piecework pay
27. Students will be able to compute paycheck deductions for Social Security and Medicare

### Unit 6

28. Students will be able to compute the cost of classified ads for used cars
29. Students will be able to compute the cost of sales tax on automobiles
30. Students will be able to compute mean, median, mode, range, quartiles, and interquartile range
31. Students will be able to create a frequency distribution from a set of data
32. Students will be able to use box-and-whisker plots and stem-and-leaf plots to display information
33. Students will be able to compute insurance costs and payments on insurance claims
34. Students will be able to write, interpret, and graph a straight line depreciation equation
35. Students will be able to write, interpret, and graph an exponential depreciation equation
36. Students will be able to write, interpret, and use the distance formula
37. Students will be able to calculate and use the braking distance in both the English Standard and Metric Systems

### **Vocabulary/Key Terms**

**Unit 5** – biweekly, semimonthly, monthly, direct deposit, hourly rate, regular hours, overtime hours, overtime hourly rate, time-and-a-half overtime, double-time pay, gross pay, minimum wage, commission, pieceworker, piecework rate, royalty, employee benefits, paid vacation time, paid holiday time, retirement plans, unemployment insurance, pension Social Security, Medicare tax

**Unit 6** - sales tax, domain, piecewise function, statistics, median, skew, range, quartiles, lower quartile, upper quartile, interquartile range (IQR), mode, bimodal, frequency distribution, stem-and-leaf plot, boxplot, frequency, box-and-whisker plot, dollar value, historical depreciation, historical data, exponential decay, depreciation, appreciation, skid mark

### **Assessments:**

Uniform Test/Quiz  
Classwork  
Homework

### **Common Core Standards:**

**Unit 5** - A-CED1, A-CED2, A-CED4, A-REI3, F-IF2, F-BF1, F-LE1, F-IF4, F-IF7b  
**Unit 6** - F-IF1, F-IF2, F-IF7b, S-ID2, S-ID3, S-ID4, A-CED2, A-CED3, F-IF7e, F-IF8b, F-IF9, F-LE1c, F-LE5, S-ID6, G-C5



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