Pearson

Algebra with Finance

Semester A Summary:
In the first semester of this course, the student will focus on data and its many uses in the real world. The student will begin by exploring ways to represent data through several types of graphs, and will then develop strategies for interpreting data, methods for collecting data, and techniques for analyzing and using data. The course concludes with a detailed study of probability and probability models.

Semester A Outline

1. **Graphs**
    1. Line Graphs
        - Interpret line graphs
    2. Bar Graphs
        - Interpret bar graphs
        - Construct bar graphs
    3. Pie Charts
        - Interpret pie charts
        - Construct pie charts
    4. Graphs Portfolio
        - Construct a bar graph
        - Construct a pie chart
    5. Frequency Graphs
        - Interpret stem-and-leaf plots
        - Interpret pictographs
        - Interpret histograms
        - Interpret cumulative frequency graphs
    6. Linear Graphs
        - Construct and interpret linear graphs representing real-world situations
        - Solve real-world applications of systems of linear equations and inequalities involving two or three variables
    7. Unit Review: Graphs
    8. Unit Test
2. **Interpretation of Data**
    1. Mean
        - Calculate the mean of a data set
    2. Median and Mode
        - Calculate the median of a data set
        - Calculate the mode of a data set
    3. Box-and-Whisker Plots
        - Interpret box and whisker plots
        - Calculate the lower extreme, lower quartile, upper quartile, and upper extreme for a data set
    4. Measures of Variation

- Calculate standard deviation of a data set
- Calculate the interquartile range of a data set
- Calculate the variance of a data set

5. Interpretation of Data Portfolio
6. Validity of Arguments
   - Identify the internal and external validity of collected data
7. Data Types
   - Identify quantitative and qualitative data
8. Unit 2 Review: Interpretation of Data
9. Unit Test

3. **Collection of Data**
   1. Questionnaires
      - Identify the audience for a questionnaire
      - Use best practices for writing questions for a questionnaire
      - Describe the pros and cons of questionnaires
   2. Collection of Data Portfolio
      - Collect data by using a questionnaire
   3. Interviews
      - Identify appropriate questions for different interview types
      - Differentiate between open and closed questions
      - Identify pros and cons of different interview types
   4. Observations
      - Differentiate between the different observation types
   5. Historical Methods
      - Identify benefits and risks of using the internet for research
      - Identify advantages and disadvantages of panels
   6. Case Studies
      - Identify data collection methods that can be used to develop a case study
   7. Unit Review: Collection of Data
   8. Unit Test
4. **Uses of Data**
   1. Scatter Plots
      - Identify situations that show positive, negative, or no correlation
      - Use scatterplots do draw conclusions about situations
   2. Linear Regression – Line of Best Fit
      - Use linear regression to make predictions
      - Interpret correlation coefficients
   3. Uses of Data Portfolio
   4. Quadratic Functions
      - Solve quadratic equations using the quadratic formula
   5. Exponential Functions
      - Identify exponential functions
      - Use the continuous change function to solve problems
   6. Exponential Growth and Decay
      - Identify situations that represent exponential growth and decay
      - Write exponential growth and decay functions
   7. Exponential Regression
      - Create exponential regression models
      - Use an exponential regression model to predict values
   8. Building and Interpreting Mathematical Models
      - Create a model for a given scenario
      - Analyze mathematical models

9. Uses of Data Activity
10. Populations, Samples, and Biases in Data
    - Recognize biases in collected data
    - Identify sampling methods
    - Use samples to estimate population proportions
11. Unit Review: Uses of Data
12. Unit Test

5. **Probability**
    1. Introduction to Probability and Sample Spaces
        - List the sample space of an experiment
        - Calculate the total number of possibilities of an event using the Fundamental Counting Principle
    2. Tree Diagrams, Permutations, and Combinations
        - Determine the total number of possibilities of an event by using tree diagrams
        - Determine the total number of possibilities of an event by using permutations
    3. Calculating Probabilities
        - Determine the number of outcomes in an experiment
        - Determine the number of favorable outcomes in an experiment
        - Determine the probability of an event
    4. Independent and Dependent Events
        - Calculate probability of two independent events
    5. Probabilities and Odds
        - Calculate experimental probabilities
        - Calculate theoretical probabilities
        - Calculate odds
    6. Unit Review: Probability
        - determine the total number of possibilities of an event by using tree diagrams, permutations, combinations, and the Fundamental Counting Principle
        - calculate theoretical probabilities, experimental probabilities, and odds
        - recognize the difference between independent and dependent events
    7. Unit Test
6. **Probability Models**
    1. Normal Distributions
        - Apply the empirical rule to normally distributed data
        - Use shape to categorize data as normally distributed or skewed
        - Use standard deviation to determine if data follows a normal distribution
    2. Probability Models Portfolio
    3. Binomial Models
        - Identify data that follows a binomial model
        - Use the binomial model to calculate probabilities
    4. Geometric Models
        - Use geometric models to calculate probabilities
    5. Unit Review: Probability Models
    6. Unit Test

Semester B Summary:
In the second semester of this course, the student will explore useful personal finance topics, including wages, budgeting, personal taxes, credit cards, banking choices, home and automobile

financing, insurance, savings, and investments. The latter part of this course is dedicated to appreciating math in diverse fields, such as science, art, architecture, and music.

Semester B Outline

1. **Personal Finance**
    1. Rate of Change – Slope
        - Calculate rate of change from a graph
        - Calculate slope from two points
    2. Compensation
        - Calculate weekly, monthly, and annual income
        - Compare two or more income scenarios
    3. Benefits and Deductions
        - Analyze earnings based on wages and deductions
    4. Budgeting
        - Identify credit or cash payments
        - Calculate expenditures for cash management
        - Identify credit overload
    5. Personal Taxes
        - Calculate tax amount from schedules
        - Identify characteristics of the federal tax system
        - Identify and calculate tax refunds and tax due
    6. Personal Finance Review
        - Describe the components and different types of income
        - Identify characteristics of the federal income tax system
        - Calculate income tax cases and changes exposing any unreasonable jumps
    7. Unit Test
2. **Credit and Debit Introduction**
    1. Credit Cards and Reasons to Have Them
        - Identify characteristics of credit cards
        - Identify risks and benefits of credit
        - Calculate interest and credit card balance
        - Identify characteristics of debit cards and accounts
    2. Credit Scores and Reports
        - Interpret credit score meanings
        - Identify actions that can improve or harm credit scores
    3. Making Monthly Payments
        - Calculate effective interest rate
        - Calculate monthly payments and total payback
        - Calculate monthly payments for deferred interest loans
        - Identify methods for paying down debt
    4. Simple and Compound Interest
        - Calculate simple interest
        - Calculate compound interest
        - Calculate APY given APR
    5. Other Banking Decisions
        - Calculate checking account income
        - Use a system of equations to compare checking account options
        - Calculate checking balances
    6. Credit and Debit Review
        - Calculate interest and a credit card balance

        - Compare the annual percentage rate and interest charges
        - Describe three of the charges and earnings of checking account services
    7. Unit Test
3. **Financial Decisions**
    1. Home Financing
        - Identify characteristics of the Final Settlement Statement when purchasing a home.
    2. Home Finance: Loan Types and Payments
        - Identify characteristics of different types of loans
        - Calculate affordable price ranges for mortgage payments
    3. Automobile Financing
        - Identify the costs associated with purchasing a vehicle
        - Calculate the monthly payment of a car loan
        - Determine maximum loan amount based on a set monthly payment
    4. Home Insurance
        - Identify characteristics of home insurance
        - Calculate insurance deductibles and payments
    5. Auto Insurance
        - Identify characteristics of auto insurance
        - Calculate auto insurance premiums
        - Interpret auto insurance quotes
    6. Types of Savings
        - Identify reasons to save
        - Identify characteristics of savings accounts
    7. Financial Decisions Review
        - calculate monthly payments and total cost of loans
        - compare straight line and rapid depreciation
        - calculate balance owed on a financed vehicle
        - calculate the value of money invested over a period of time
        - compare the cost of taking out a loan for an item to using savings to purchase the same item
    8. Unit Test
4. **Life Insurance and Investment**
    1. Life Insurance Coverage Options
        - Identify characteristics of life insurance
    2. Life Insurance Rates
        - Calculate life insurance rates
        - Calculate probabilities related to life expectancy
    3. Investment Basics
        - Identify characteristics of investment basics
    4. Stocks and Bonds
        - Identify characteristics of stocks and bonds
    5. Annuities and Retirement Plans
        - Identify characteristics of annuities and retirement plans
        - Calculate annuities and retirement plan savings
    6. Life Insurance and Investment Review
        - Analyze the benefits and drawbacks to various types of savings plans
        - Identify different types of stock market investing strategies
        - List seven considerations that should be taken into account when deciding how to invest
    7. Unit Test
5. **Science**

1. Right Triangles
    - Identify parts of right triangles
    - Calculate angle measures in right triangles
2. Trigonometric Ratios
    - Calculate trigonometric ratios
    - Use trigonometric ratios to find unknown distances
3. Calculating Distance
    - Use the distance formula to determine distances on the coordinate plane
    - Solve distance problems involving rate and time
4. Periodic Motion
    - Identify characteristics of periodic motion
5. Direct and Inverse Variation
    - Solve problems involving direct and inverse variation
6. Physical Laws
    - Use Hooke's Law to model direct variation
    - Use Boyle's Law to model inverse variation
7. Science Review
    - Use trigonometric ratios to find unknown distances
    - Use distance formulas to solve application problems
    - Model direct variation
    - Model inverse variation
8. Unit Test

6. **Fine Arts**
    1. Geometric Transformations
        - Identify characteristics of reflections, rotations, translations, and dilations
    2. Lines of Symmetry
        - Determine the number of lines of symmetry in a given figure
    3. Ratios and Proportions
        - Use the properties of proportions to find unknown values
    4. Mathematical Patterns in Art and Architecture
        - Identify characteristics of the golden ratio
        - Identify uses of geometric principles in art and architecture
    5. Mathematical Patterns in Music
        - Identify the uses of ratios, proportions, periodic motion, and transformations in music
    6. Fine Arts Review
        - Recognize reflections, rotations, translations, and dilations
        - Determine the number and types of lines of symmetry in a given figure
        - Use the properties of proportions to find unknown values
        - Use the golden ratio and identify its use in art and architecture
        - Identify the uses of ratios, proportions, periodic motion, and transformations in music
    7. Unit Test

