Content Map: Decision Making in Finance

Teacher Materials: Decision Making in Finance Teacher Materials (The Charles A. Dana Center)

CCGPS Unit Standards or Troup County Version (TCV):

- **MAMDMA3.**
  Students will create and analyze mathematical models to make decisions related to earning, investing, spending, and borrowing money.
  - a. Use exponential functions to model change in a variety of financial situations
  - b. Determine, represent, and analyze mathematical models for income, expenditures, and various types of loans and investments

- **MAMDMG1.**
  Students will create and use two- and three-dimensional representations of authentic situations.

- **MAMDMG2.**
  Students will solve geometric problems involving inaccessible distances using basic trigonometric principles, including the Law of Sines and the Law of Cosines

Prerequisites:

- Using scatterplots, exponential functions, and regression equations
- Using formulas involving exponents and rational expressions
- Understanding decay as a rate in an exponential function rules
- Using sequences to describe a situation
- Using direct and indirect relationships
- Using exponential functions
- creating bar graphs
- Applying weighted averages

Unit Length: 28 days
TCSS – Advanced Mathematical Decision Making
Unit 6

Concept 1: Future Value of an Investment (MAMDMA3 a and b)

Essential Questions:
- How can students analyze which income opportunities are best for a given situation based on type of income, type of employment, taxes, benefits, and financial goals?
- How can students calculate and graph simple and compound interest problems and identify the appropriate model based on their respective scatterplots?
- How can students research and calculate how the cost of living reduces the earnings of investments and raises in income?
- How can students generate the exponential formula for the future value of an investment using regression equations, identify the key properties, and analyze the reasonableness of the model in the real world?
- How can students analyze and adjust the future-value formula to account for compound interest?
- How can students research and apply current interest rates on bank investments?

Resources:
6A Student Activity Sheet 1: You Have to Get Money to Make Money
6A Teacher Activity Sheet 1: You Have to Get Money to Make Money
6A Student Activity Sheet 2: What Makes Money Work for You?
6A Teacher Activity Sheet 2: What Makes Money Work for You?
6A Student Activity Sheet 3: Time Value of Money
6A Teacher Activity Sheet 3: Time Value of Money

Concept 2: Present Value of an Investment (MAMDMA3 a and b)

Essential Questions:
- How can students generate exponential present-value formula using the future-value formula, identify key properties, and analyze the reasonableness of the model in the real world?
- How can students examine the present value of an investment in terms of a timeline and connect the present-value formula to sequences?
- How can students analyze and adjust the present-value formula to account for compounded interest periods other than annual?
- How can students confirm the time value of money calculator results with the future-value and present-value formulas and analyze the parameters and effects of rounding to real-world applications?
- How can student analyze given real-world scenarios dealing with the future value and present value of an investment, present and discuss their conclusions, and synthesize the results into solutions to life lessons?

Resources:
6B Student Activity Sheet 4: Road to $1 Million
6B Teacher Activity Sheet 4: Road to $1 Million
6B Student Activity Sheet 5: A Cool Tool!
6B Teacher Activity Sheet 5: A Cool Tool!
Concept 3: Building an Investment (MAMDMA3. a-b; MAMDMG1; MAMDMG2)

Essential Questions:
- How can students generate finite geometric series for the future value of an annuity?
- How can students explore the relationship between the present value of an investment security and interest rates, risk ratings, and/or the present value of another investment security?
- How can students determine the portfolio of an investment based on interest rates, risk ratings, investor needs?
- How can students calculate the expected value of an investment based on a probability of future value?
- How can students examine the standard of living at retirement, calculate future value of a retirement investment, and determine the monthly payments needed to save for retirement?

Resources:
- 6C Student Activity Sheet 6: Investing As You Go
- 6C Teacher Activity Sheet 6: Investing As You Go
- 6C Student Activity Sheet 7: Investment Probability
- 6C Teacher Activity Sheet 7: Investment Probability

Concept 4: Using Credit (MAMDMA3 a and b)

Essential Questions:
- How can students analyze the parts of a credit card statement and derive how the calculations are made?
- How can students calculate the minimum payment on a credit card balance and the length of repayment based on that minimum and recommend an alternate debt repayment plan?
- How can students distinguish the difference between annual percentage rate and effective annual rate with respect to credit card costs?
- How can students create an amortization model based on a set debt plan and analyze the behavior of principal and interest with a constant payment?
- How can students analyze real-world scenarios involving credit card debt, present and discuss their conclusions, and synthesize the results into solutions to life problems?
- How can students calculate the monthly payment for financing a new vehicle and analyze the costs of financing an asset that is scheduled to lose value?
- How can students evaluate the tangible and intangible costs associated with leasing a vehicle and calculate the monthly payment for financing a new vehicle through a purchase option?
- How can students compare the three methods of financing a new vehicle and analyze affordability based on budget constraints?

Resources:
- 6D Student Activity Sheet 8: Making Sense of Credit
- 6D Teacher Activity Sheet 8: Making Sense of Credit
- 6D Student Activity Sheet 9: Understanding Credit Card Debt
- 6D Teacher Activity Sheet 9: Understanding Credit Card Debt
- 6D Student Activity Sheet 10: Buying a Losing Investment
- 6D Teacher Activity Sheet 10: Buying a Losing Investment