

# Mathematics

# Fairfield Public Schools

## Financial Algebra 42



## **FINANCIAL ALGEBRA 42**

Financial Algebra focuses on real-world financial literacy, personal finance, and Algebraic approaches to solving problems. Students will apply what they learned in Algebra 1 and Geometry topics including personal income, taxes, checking and savings accounts, credit, loans and payments, car leasing and purchasing, home mortgages, stocks, insurance, and retirement planning. Students will extend their investigations using more advanced mathematics, such as systems of equations when studying cost and profit issues and exponential functions when calculating interest problems.

Pacing Guide									
1st Marking Period		2nd Marking Period			3rd Marking Period			4th Marking Period	
September	October	November	December	January	February	March	April	May	June
Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6		Unit 7	Unit 8	
<u><a href="#">Checking and Savings Accounts</a></u>	<u><a href="#">Gross and Net Income</a></u>	<u><a href="#">Managing Finances and Budgeting</a></u>	<u><a href="#">Buying Goods and Services with Cash/Debit</a></u>	<u><a href="#">Using Credit I</a></u>	<u><a href="#">Using Credit II</a></u>		<u><a href="#">Protecting Against Risk</a></u>	<u><a href="#">Saving and Investing</a></u>	
6 weeks	5 weeks	2 weeks	2 weeks	3 weeks	8 weeks		3 weeks	2 weeks	

Course Overview		
<p><b>Central Understandings</b> Insights learned from exploring generalizations through the essential questions. (Students will understand that...)</p> <ul style="list-style-type: none"> <li>• Mathematics is the basis for sound financial decisions.</li> <li>• Patterns and functional relationships can be represented and analyzed using a variety of strategies, tools, and technologies.</li> <li>• Quantitative relationships can be expressed numerically in multiple ways in order to make connections and simplify calculations using a variety of strategies, tools, and technologies.</li> <li>• Shapes and structures can be analyzed, visualized, measured, and transformed using a variety of strategies, tools, and technologies.</li> <li>• Data can be analyzed to make informed decisions using a variety of strategies, tools, and technologies.</li> </ul>	<p><b>Essential Questions</b></p> <ul style="list-style-type: none"> <li>• In what ways can Algebra be used to better understand finance?</li> <li>• How do patterns and functions help us describe financial data to solve a variety of problems?</li> <li>• How can collecting, organizing, and displaying data help us analyze financial information and make reasonable predictions and informed decisions?</li> </ul>	<p><b>Assessments</b></p> <ul style="list-style-type: none"> <li>• Formative Assessments</li> <li>• Summative Assessments</li> </ul>

<b><u>Content Outline</u></b>	<b><u>Standards</u></b>
<p>I. <a href="#">Unit 1</a> – Checking and Savings Accounts</p> <p>II. <a href="#">Unit 2</a> – Gross and Net Income</p> <p>III. <a href="#">Unit 3</a> – Managing Finances and Budgeting</p> <p>IV. <a href="#">Unit 4</a> – Buying Goods and Services with Cash/Debit</p> <p>V. <a href="#">Unit 5</a> – Using Credit I</p> <p>VI. <a href="#">Unit 6</a> – Using Credit II</p> <p>VII. <a href="#">Unit 7</a> – Protecting Against Risk</p> <p>VIII. <a href="#">Unit 8</a> – Saving and Investing</p>	<p>Connecticut Personal Finance and Common Core Standards are met in the following areas:</p> <p>Personal Finance Standards:</p> <ul style="list-style-type: none"> <li>• <i>Earning and Reporting Income</i></li> <li>• <i>Managing Finances and Budgeting</i></li> <li>• <i>Savings and Investing</i></li> <li>• <i>Buying Goods and Services</i></li> <li>• <i>Banking and Financial Institutions</i></li> <li>• <i>Using Credit</i></li> <li>• <i>Protecting Against Risk</i></li> </ul> <p>Common Core Standards:</p> <ul style="list-style-type: none"> <li>• <i>Number and Quantity</i></li> <li>• <i>Functions</i></li> <li>• <i>Algebra</i></li> </ul>

**Unit 1 – Checking and Savings Accounts, 5 weeks [top](#)**

In this unit, the students will study the different structures to manage their money. Understanding the services provided by financial institutions will help students choose the best options to manage their money wisely. Thus, in this initial unit, the students will investigate the different types of financial institutions, the types of ways to store money, and the advantages and disadvantages of each.

<b>Big Ideas</b> The central organizing ideas and underlying structures of mathematics	<b>Essential Questions</b>
<ul style="list-style-type: none"> <li>• A checking account enables you to spend money with several advantages.</li> <li>• Having a savings account in a federally insured institution provides you with the opportunity to save money; earn interest and the security of knowing that your money will be there when you need it.</li> </ul>	<ul style="list-style-type: none"> <li>• How do you deposit money into a checking/saving account?</li> <li>• How do you withdraw money from a checking/saving account?</li> <li>• How do you calculate interest on your balance in a checking/saving account?</li> <li>• How do you reconcile your account?</li> <li>• What are the appropriate forms associated with banking accounts?</li> <li>• How are banking balances maintained?</li> <li>• How can Algebraic and graphical approaches be used to better understand present and future balances of a banking account?</li> </ul>

**Personal Finance and Common Core State Standards**

***NUMBER AND QUANTITY***

***Quantities***

**Reason quantitatively and use units to solve problems.**

**N-Q 1**

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-Q 3**

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

***SAVING AND INVESTING***

**Evaluate savings and investment options to meet short- and long-term goals.**

**S-I 1**

Describe why and how people save.

**S-I 3**

Differentiate between saving and investing.

**S-I 4**

Distinguish between simple and compound interest.

**S-I 8**

Analyze the power of compounding and the importance of starting early in implementing a plan of saving and investing.

## ***FUNCTIONS***

### ***Building Functions***

#### **Build a function that models a relationship between two quantities**

##### **F-BF.1**

Write a function that describes a relationship between two quantities.

### ***Linear, Quadratic, and Exponential Models\* F-LE***

#### **Construct and compare linear, quadratic, and exponential models and solve problems.**

##### **F-LE 1**

Distinguish between situations that can be modeled with linear functions and with exponential functions.

##### **F-LE 1c**

Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.

##### **F-LE 3**

Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.

##### **F-LE 5**

Interpret the parameters in a linear or an exponential function in terms of a context.

### ***Interpreting Functions***

#### **Understand the concept of a function and use function notation**

##### **F-IF 2**

Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

## ***BANKING AND FINANCIAL INSTITUTIONS***

#### **Evaluate services provided by financial deposit institutions to transfer funds.**

##### **B-FI 1**

Identify various types of financial institutions.

##### **B-FI 2**

Describe the basic services provided by financial institutions.

##### **B-FI 3**

Identify the rights and responsibilities associated with using a checking account.

##### **B-FI 4**

Describe the steps involved in opening and using a checking account.

##### **B-FI 5**

Compare and contrast the different types of checking accounts offered by various financial institutions.

##### **B-FI 6**

Differentiate among types of electronic monetary transactions (e.g., debit cards, ATM, and automatic deposits/payments) offered by various financial institutions.

**B-FI 7**

Identify other means of transferring funds (e.g., money orders and certified checks).

**B-FI 8**

Describe and use the steps involved in the bank reconciliation process.

**B-FI 10**

Compare costs and benefits of online and traditional banking.

## Unit 2 – Gross and Net Income, 3 weeks [top](#)

There are several different types of deductions and taxes that affect the net pay of an individual. Understanding the various ways individuals are paid can help the student make an informed decision toward what the different employers can provide. In this unit, the student will study the various approaches employers use to calculate the gross and net pay on individuals.

<b>Big Ideas</b> The central organizing ideas and underlying structures of mathematics	<b>Essential Questions</b>
<ul style="list-style-type: none"><li>• Knowing your income enables you to set a budget in order to reach financial goals.</li><li>• Different methods of payment allow comparison of gross pay for different jobs in the event a change of employment is sought.</li><li>• Understanding your deductions allows you to understand your net pay and how it differs from your gross pay.</li></ul>	<ul style="list-style-type: none"><li>• What are different ways pay is earned?</li><li>• What are different ways you receive your pay?</li><li>• What decision making process can you use to choose optimal employment based on potential income?</li><li>• In what ways do deductions affect your gross and net pay?</li><li>• How can Algebraic and graphical approaches be used to better understand gross and net income?</li></ul>

### Personal Finance and Common Core State Standards

#### ***EARNING AND REPORTING INCOME***

**Identify various forms of income and analyze factors that affect income as a part of the career decision-making process.**

##### **E-RI 1**

Calculate [gross and] net pay.

##### **E-RI 2**

Explain the effect on take-home pay of changing the allowances claimed on an “Employees’ Withholding Allowance Certificate” (IRS Form W-4).

#### ***NUMBER AND QUANTITY***

##### ***Quantities***

**Reason quantitatively and use units to solve problems.**

##### **N-Q 1**

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-Q 3**

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

**Unit 3 – Managing Finances and Budgeting, 4 weeks [top](#)**

In this unit, students will learn different approaches to managing budgets and money. Organizing and maintaining a personal financial plan are essential to budgeting for future financial goals; the daily spending and savings decisions are the center of financial planning. Thus, in this unit, the students will discuss the relationship between opportunity costs and money management, explain the benefits of keeping financial records and documents, and describe a system to maintain personal financial documents.

<b>Big Ideas</b> The central organizing ideas and underlying structures of mathematics	<b>Essential Questions</b>
<ul style="list-style-type: none"> <li>• Keeping track of the money you spend is essential to money management.</li> <li>• Budgeting allows you to pay all of your bills and helps to implement a plan so you can afford future purchases.</li> <li>• Seeing your expenditures on a budget sheet may improve your financial decision making process.</li> </ul>	<ul style="list-style-type: none"> <li>• How can Algebraic and graphical approaches be used to better understand present and future balances of a banking account?</li> <li>• How do you differentiate between fixed and variable expenses?</li> <li>• What are efficient ways to track your expenditures?</li> </ul>

**Personal Finance and Common Core State Standards**

***MANAGING FINANCES AND BUDGETING***

**Develop and evaluate a budget plan.**

**MF-B 1**

Construct and use a personal budget plan and evaluate it according to short- and long-term goals.

**MF-B 2**

Define fixed and variable expenses.

**MF-B 3**

Categorize and classify expenses as fixed or variable.

**MF-B 4**

Determine discretionary income in a budget plan.

***BUYING GOODS AND SERVICES***

**Apply a decision-making model to maximize consumer satisfaction when buying goods and services.**

**BG-S 9**

Calculate the costs of utilities, services, maintenance, and other expenses involved in independent living.

**Unit 4 – Buying Goods and Services with Cash/Debit, 3 weeks [top](#)**

In this unit, the students will study different approaches to purchasing goods and services. From all the merchandise that is available to individuals today, understanding the factors that influence buying decisions can help get the best value for the money.

<p align="center"><b>Big Ideas</b></p> <p>The central organizing ideas and underlying structures of mathematics</p>	<p align="center"><b>Essential Questions</b></p>
<ul style="list-style-type: none"> <li>Knowing how to calculate the sale price enables you to determine the final selling price and decide if the purchase is wise.</li> <li>Looking for the “best buy” is a way to save money.</li> </ul>	<ul style="list-style-type: none"> <li>What ways can you calculate final selling price?</li> <li>How can you calculate the unit price in order to determine the best buy?</li> <li>How can Algebraic and graphical approaches be used to determine the best buy?</li> </ul>

**Personal Finance and Common Core State Standards**

***BUYING GOODS AND SERVICES***

**Apply a decision-making model to maximize consumer satisfaction when buying goods and services.**

**BG-S 1**

Apply a rational decision-making process to personal buying decisions.

**BG-S 2**

Distinguish between goods and services.

**BG-S 3**

Apply comparison shopping practices and return policies.

**BG-S 4**

Identify alternative sources for purchases (e.g., online, retail stores, catalogs).

**BG-S 5**

Describe reliable consumer resources that are available to collect information for making buying decisions about durable and nondurable goods.

**BG-S 7**

Investigate current types of consumer fraud, including online scams.

**BG-S 8**

Compare the costs and benefits of purchasing, leasing, and renting.

**BG-S 10**

Explain how a consumer can identify and report fraudulent behavior and practices observed on the Internet.

***FUNCTIONS***

***Building Functions***

**Build a function that models a relationship between two quantities**

**F-BF 1**

Write a function that describes a relationship between two quantities.

## Unit 5 –Using Credit I, 5 weeks [top](#)

In this unit, students will be studying aspects of credit through credit cards. There are advantages to using credit if it is used correctly. Students will learn to protect their credit through the warning signs for debt problems.

<b>Big Ideas</b> The central organizing ideas and underlying structures of mathematics	<b>Essential Questions</b>
<ul style="list-style-type: none"><li>Using a credit card to make purchases allows the card holder the flexibility to “buy now, pay later.”</li><li>There is considerable responsibility in using a credit card, and it is important that the user understands how interest is calculated.</li></ul>	<ul style="list-style-type: none"><li>What are the benefits and risks of credit cards?</li><li>What information can you use to determine the best credit card for an individual?</li><li>How can Algebraic and graphical approaches be used to determine how interest is calculated and reported?</li></ul>

### Personal Finance and Common Core State Standards

#### ***USING CREDIT***

**Analyze factors that affect the choice of credit, the cost of credit, and the legal aspects of using credit.**

##### **UC 1**

Describe the process of borrowing to purchase of goods and services.

##### **UC 2**

Describe the risks and responsibilities associated with using credit.

##### **UC 3**

Identify the opportunity cost of credit decisions.

##### **UC 4**

Identify methods of establishing and maintaining a good credit rating.

##### **UC 5**

Determine the advantages and disadvantages of using credit.

##### **UC 6**

Describe the various methods of financing a purchase.

##### **UC 7**

Describe interest as a cost of credit and explain why it is charged.

##### **UC 8**

Describe the importance of a sound credit rating.

##### **UC 9**

Analyze credit card features and their impact on personal financial planning.

##### **UC 10**

Explain why an interest rate varies with the amount assumed risk.

##### **UC 11**

Explain credit ratings and reports and describe why they are important to consumers.

##### **UC 12**

Describe examples of the benefits of financial responsibility and the costs of financial irresponsibility.

**UC 13**

Identify strategies for effective debt management.

**UC 16**

Identify specific steps that consumers can take to minimize their exposure to identity theft.

**UC 17**

Describe problems that occur when an individual is the victim of identity theft.

**UC 18**

Identify specific steps that should be taken by a victim of identity theft.

**UC 19**

Identify ways that thieves can fraudulently obtain personal information.

**UC 21**

Compare and contrast the various aspects of credit cards (e.g., APR, grace period, incentive buying, methods of calculating interest, and fees).

***FUNCTIONS******Interpreting Functions*****Interpret functions that arise in applications in terms of the context****F-IF 4**

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.\**

## Unit 6 – Using Credit II, 5 weeks [top](#)

In this unit, students will learn the various aspects of credit through loans. It is important to understand the various advantages, disadvantages, and cost when taking out a loan. The students will investigate the different types of loans associated with credit, including home, short-term, etc.

<b>Big Ideas</b> The central organizing ideas and underlying structures of mathematics	<b>Essential Questions</b>
<ul style="list-style-type: none"><li>• Obtaining a loan to make purchases allows the individual the flexibility to “buy now, pay later.”</li><li>• There is considerable responsibility in obtaining a loan, and it is important that the user understands how interest is calculated.</li></ul>	<ul style="list-style-type: none"><li>• What are the benefits and risks of loans?</li><li>• What information can you use to determine the best loan for an individual?</li><li>• How can Algebraic and graphical approaches be used to determine how interest is calculated and reported?</li></ul>

### Personal Finance and Common Core State Standards

#### ***USING CREDIT***

**Analyze factors that affect the choice of credit, the cost of credit, and the legal aspects of using credit.**

##### **UC 1**

Describe the process of borrowing to purchase of goods and services.

##### **UC 2**

Describe the risks and responsibilities associated with using credit.

##### **UC 3**

Identify the opportunity cost of credit decisions.

##### **UC 4**

Identify methods of establishing and maintaining a good credit rating.

##### **UC 5**

Determine the advantages and disadvantages of using credit.

##### **UC 15**

Identify the components listed on a credit report and explain how that information is used and is received by and reported from the credit reporting agencies.

##### **UC 10**

Explain why an interest rate varies with the amount assumed risk.

##### **UC 11**

Explain credit ratings and reports and describe why they are important to consumers.

##### **UC 12**

Describe examples of the benefits of financial responsibility and the costs of financial irresponsibility.

**FUNCTIONS**

***Interpreting Functions***

**Interpret functions that arise in applications in terms of the context**

**F-IF 4**

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.\**

**Unit 7 – Protecting Against Risk, 3 weeks [top](#)**

Having the right insurance program and risk management plan can protect against / from financial loss. The goal of an insurance program is to get the best protection at the lowest cost, and there are many factors that affect the cost of insurance. Thus, it is important to understand the different types of insurance that are offered, from property to health insurance.

<b>Big Ideas</b>	<b>Essential Questions</b>
<p>The central organizing ideas and underlying structures of mathematics</p> <ul style="list-style-type: none"> <li>• Various types of insurance offer financial protection for both you and your property.</li> <li>• A good financial plan should include health and life insurance.</li> </ul>	<ul style="list-style-type: none"> <li>• Why is it important for individuals to purchase insurance for their property and belongings?</li> <li>• What are the most common types of risk?</li> <li>• What factors will influence your insurance goals?</li> <li>• What should you look for in a health insurance policy?</li> </ul>

**Personal Finance and Common Core State Standards**

***PROTECTING AGAINST RISK***

**Analyze choices available to consumers for protection against risk and financial loss.**

**PAR 1**

Identify risk in life and how to gain protection against the consequences of risk.

**PAR 2**

Evaluate insurance as a risk management strategy.

**PAR 3**

Identify the type of insurance associated with different types of risk (e.g., automobile, personal and professional liability, home and apartment, health, life, long term care, and disability).

**PAR 4**

Explain the role of insurance in financial planning.

**PAR 5**

Determine recommendations for insurance coverage for individuals/families at different income levels and varying risks.

**Unit 8 – Saving and Investing, 4 weeks [top](#)**

When individuals know about different investment opportunities and the financial planning process, they will be able to select a savings or investment program tailored to their goals. From this, individuals can make the best investments for their financial situation when they understand the various structures with the stock market and different types of investments.

<p align="center"><b>Big Ideas</b></p> <p>The central organizing ideas and underlying structures of mathematics</p>	<p align="center"><b>Essential Questions</b></p>
<ul style="list-style-type: none"> <li>• Informed investors know how to save and plan wisely for reaching goals and achieving financial security.</li> <li>• Exploring stock markets can help you understand your choices, risks, and benefits when investing in stock.</li> </ul>	<ul style="list-style-type: none"> <li>• Why is it impossible to create a “one size fits all” investment strategy for everyone?</li> <li>• What research and planning can you do now to help secure your financial future?</li> <li>• What do you need to know about stocks before you invest your hard earned money?</li> <li>• How can Algebraic and graphical approaches be used to determine possible future values of investments?</li> </ul>

**Personal Finance and Common Core State Standards**

***SAVING AND INVESTING***

**Evaluate savings and investment options to meet short- and long-term goals.**

**S-I 1**

Describe why and how people save.

**S-I 2**

Identify the opportunity costs of saving.

**S-I 3**

Differentiate between saving and investing.

**S-I 6**

Describe how the stock market functions.

**S-I 7**

Identify the risk/return trade-offs for saving and investing.

**S-I 8**

Analyze the power of compounding and the importance of starting early in implementing a plan of saving and investing.

**S-I 9**

Compare the tax savings by making contributions to pre-tax retirement savings accounts.

**S-I 10**

Calculate an employer’s matching contribution to a retirement account.

## **FUNCTIONS**

### ***Building Functions***

**Build a function that models a relationship between two quantities**

#### **F-BF.1**

Write a function that describes a relationship between two quantities.

### ***Linear, Quadratic, and Exponential Models\* F-LE***

**Construct and compare linear, quadratic, and exponential models and solve problems.**

#### **F-LE 1**

Distinguish between situations that can be modeled with linear functions and with exponential functions.

##### **F-LE 1c**

Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.

#### **F-LE 3**

Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.

#### **F-LE 5**

Interpret the parameters in a linear or an exponential function in terms of a context.

### ***Interpreting Functions***

**Understand the concept of a function and use function notation**

#### **F-IF 2**

Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

## **ALGEBRA**

### ***Creating Equations***

**Create equations that describe numbers or relationships.**

#### **A-CED 1**

Create equations and inequalities in one variable and use them to solve problems. *Include equations arising from linear functions ....*

#### **A-CED 3**

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-CED 4**

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  $R$ .