Kenilworth Public Schools

Curriculum Guide

Content Area: Math Foundations
Grade: 8
BOE Approved: 4/8/19

Revision Date: 5/13/19
Submitted by: Michelle Alvarez, Nancy Bechtler & Lauren Bound
BOE Revision Approved: N/A

Mathematics- Grade 8 Foundations Scope and Sequence

Unit 1- Fractions & Decimals	Unit 2- Integers & Rational Numbers	Unit 3- Coordinate Plane	Unit 4- Equations	Unit 5- Word Problems	Unit 6- Financial Literacy (Can be integrated throughout course or taught as end of course unit)
Weeks 1-6	Weeks 7-16	Weeks 17-21	Weeks 22-30	Weeks 31-34	Weeks 35-38
Unit Description: All students will develop an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers.	*Unit Description:* All students will add, subtract, multiply, and divide integers and rational numbers.	*Unit Description:* All students will identify locations on a coordinate plane, use the coordinate grid to find specific locations in a two dimensional space, and describe critical characteristics of the coordinate plane (such as axes, origin, and quadrants).	*Unit Description:* All students will write and simplify expressions and solve multi step equations.	*Unit Description:* All students will systematically deconstruct a word problem and utilize various strategies to solve it.	*Unit Description:* Students will be introduced to the world of investing by exploring the mechanics of investing in the stock market. We will begin by learning about the difference between private and public companies, why some private companies elect to become public, and what being public means/entails. Students will then explore the process of

					becoming public and learn about such concepts as; IPO, stock, stock symbols, stock exchanges, what influences the price of a stock, dividends, and stock splits. Students will be introduced to the concept of credit- what it is and why it is important. We will first explore the significance of credit from a global perspective, after which we will drill down to identify the significance of credit on a personal level. Along the way, students will learn about various forms of credit including; mortgages, student loans, auto loans, and credit cards. Discussions will identify the advantages and potential pitfalls of

					managing credit. Other concepts covered include; how do credit card companies make money, the consequences of only paying the minimum on your credit card balance, FICO scores, and bankruptcy. Students will learn various forms of taxes including; income, sales, and property taxes. While discussing income tax, students will learn what entities tax their income, the difference between gross and net income, how to lower your taxable income, and how the government spends the tax revenues. Additionally, students will gain an understanding of how federal tax is the same from state to state, yet the state income tax varies widely by state.

					When discussing property tax, we will analyze the components of property tax to determine how this tax is calculated, as well as, compare property tax rates across the country.
Unit Targets: • Write and identify equivalent fractions in simplest form. • Use equivalent fractions to represent a pair of fractions as fractions with a common denominator. • Find sums and differences involving fractions with like and unlike denominators. • Convert between fractions and decimals. • Solve division problems using the reciprocal.	*Unit Targets:* • Compare and order integers. • Use order of operations to evaluate numerical expressions. • Add, Subtract, multiply and divide integers without the use of calculators. • Calculate absolute value expressions.	*Unit Targets:* • Define ordered pairs. • Show how to plot points on a Cartesian plane. • Locate the origin on the coordinate plane. • Discuss the x and y axis • Introduce slope.	*Unit Targets:* • Solve two step equations using addition, subtraction, multiplication, and division. • Solve multi-step real life and mathematical equations. • Use the distributive property to solve numerical expressions and equations. • Translate and write equivalent expressions by applying properties. • Solve multi-step equations by applying	*Unit Targets:* • Identify the information needed. • Identify the correct operation. • Set up the math problem using various problem solving strategies. • Accurately complete the mathematical equation.	*Unit Targets:* • Understand and synthesize how key economic concepts affect their planning and decision-making as it relates to investing. • Comprehend various investing terms and concepts including 401k plans, IRAs, public vs. private companies, IPOs, stock prices, dividends, stock splits. • Research to gather and evaluate different

• Order rational numbers including on a number line.			properties of rational numbers.		stocks' information, prices, and performance. • Research, analyze and purchase stocks in a mock stock portfolio. • Understand what credit is and its significance both globally and on a personal basis. • Identify the different forms of credit and compare/contrast. • Understand the pros and cons of using credit (potential pitfalls). • Determine the process by which credit is extended. • Comprehend what a credit score is and how it is calculated. • Appreciate the importance of maintaining a high credit score. • Calculate the financial consequences of not paying your credit on time. • Comprehend the difference between gross salary (income)

					and net income in New Jersey. • Understand what entities tax their income. • Calculate the amount of taxes taken out of their income as a New Jersey resident. • Understand the difference in state income taxes. • Calculate the amount of taxes taken out of different salaries and compare among states. • Understand how both the Federal and State governments utilize the tax revenues. • Understand other forms of taxes that individuals pay including; sales and property tax. • Determine how property tax is calculated.

Mathematics- Grade 8 Foundations Unit 1

Unit Title: Fractions & Decimals

Unit Summary: All students will develop an understanding of fraction equivalence, addition and subtraction of fractions with like denominators, and multiplication of fractions by whole numbers.

Primary Interdisciplinary Connections: Literature, Technology

21st Century Career and Life Themes: Global Awareness

Learning Targets

NJSLS Standards: 6.RP.1-3

Technology Standards: 8.1.5.A.1

Content Statements:

1	Equivalent Fractions
2	Simplest Form
3	Like and Unlike Denominators
4	Add, Subtract, Multiply, and Divide Fractions

Big Idea: Different strategies can help us compute numbers more efficiently.

Unit Essential Questions:	**Unit Enduring Understandings:**
• How do you use fractions to solve real world problems?	• Using a variety of strategies, we can use fractions to solve real-world problems.

Unit Learning Targets
Students will…

- Write and identify equivalent fractions in simplest form.
- Use equivalent fractions to represent a pair of fractions as fractions with a common denominator.
- Find sums and differences involving fractions with like and unlike denominators.
- Convert between fractions and decimals.
- Solve division problems using the reciprocal.
- Order rational numbers including on a number line.

Evidence of Learning

Summative Assessment: Performance Task Assessments

Formative Assessments:

- ST Math
- Teacher observation
- Notebook check
- Class participation
- Problem of the Day

Lesson Plans

Activities/Interdisciplinary Connections	*Timeframe*
• Basic Skills Worksheets from various sources • ST Math	Weeks 1-6
Teacher Resources	*Teacher Note*
• Teacher Supplemental Binder	

Differentiating Instruction: Students with Disabilities, English Language Learners, and Gifted & Talented Students

Examples of Strategies and Practices that Support Students with Disabilities:
• Use of visual and multisensory formats
• Use of assisted technology
• Use of prompts
• Modification of content and student products
• Testing accommodations
• Authentic assessments

Examples of Strategies and Practices that Support Gifted & Talented Students:
• Adjusting the pace of lessons
• Curriculum compacting
• Inquiry-based instruction
• Independent study
• Higher-order thinking skills
• Interest-based content
• Student-driven instruction
• Real-world problems and scenarios

Examples of Strategies and Practices that Support English Language Learners:
• Pre-teaching of vocabulary and concepts
• Visual learning, including graphic organizers
• Use of cognates to increase comprehension
• Teacher modeling
• Pairing students with beginning English language skills with students who have more advanced

English language skills
• Scaffolding
•Word walls
•Sentence frames
•Think-pair-share
•Cooperative learning groups

Mathematics- Grade 8 Foundations Unit 2

Unit Title: Integers and Rational Numbers

Unit Summary: All students will add, subtract, multiply, and divide integers and rational numbers.

Primary Interdisciplinary Connections: Literature, Technology

21st Century Career and Life Themes: Global Awareness

Learning Targets

NJSLS Standards: 7.NS.1.A-D, 7.RP.1, 7.EE.1, 7.EE.2

Technology Standards: 8.1.5.A.1

Content Statements:

1	Variable expressions with integers
2	Calculate absolute value
3	Order of operations involving integers

Big Idea: For a given set of integers, there are relationships between positive and negative numbers that are always true and these are the rules that govern arithmetic and algebra.

Unit Essential Questions:	**Unit Enduring Understandings:**
• What is the difference between the opposite and the absolute value of a number? • How can we predict that the sum of two integers is positive, negative, or zero?	• Absolute value is a number's distance from zero. • Relationships exist between positive and negative integers.

Unit Learning Targets
Students will…

- Use a number line to determine absolute value.
- Use order of operations to evaluate numerical expressions with integers.
- Add, Subtract, multiply and divide integers without the use of calculators.

Evidence of Learning

Summative Assessment: Performance Task Assessments

Formative Assessments:

- ST Math
- Teacher observation

- Notebook check
- Class participation
- Problem of the Day

Lesson Plans

Activities/Interdisciplinary Connections	*Timeframe*
• Basic Skills Worksheets from various sources • ST Math	Weeks 7-17
Teacher Resources	*Teacher Note*
• Teacher Supplemental Binder	

Differentiating Instruction: Students with Disabilities, English Language Learners, and Gifted & Talented Students

Examples of Strategies and Practices that Support Students with Disabilities:
• Use of visual and multisensory formats
• Use of assisted technology
• Use of prompts
• Modification of content and student products
• Testing accommodations
• Authentic assessments

Examples of Strategies and Practices that Support Gifted & Talented Students:
• Adjusting the pace of lessons
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•Think-pair-share •Cooperative learning groups

Mathematics- Grade 8 Foundations Unit 3

Unit Title: Coordinate Plane

Unit Summary: All students will identify locations on a coordinate plane, use the coordinate grid to find specific locations in a two dimensional space, and describe critical characteristics of the coordinate plane (such as axes, origin, and quadrants).

Primary Interdisciplinary Connections: Social Studies

21st Century Career and Life Themes: Civic Literacy, Economic Literacy

Learning Targets

NJSLS Standards: 5.GA.1, 5.GA.2

Technology Standards: 8.1.5.A.1

Content Statements:

1	Plot ordered pairs
2	Identify parts of the coordinate plane
3	Slope

Big Idea: Graph points on the coordinate plane to solve real-world and mathematical problems.

Unit Essential Questions:

- How does the coordinate system work?
- How do coordinate grids help you organize information?
- How might a coordinate grid help me understand a relationship between two numbers?

Unit Enduring Understandings:

- Coordinate geometry can be used to represent and verify algebraic/geometric relationships
- On the coordinate plane, a point represents two facets of information associated with an ordered pair.

Unit Learning Targets

Students will…

- Define ordered pairs
- Show how to plot points on a Cartesian plane
- Locate the origin on the coordinate plane
- Discuss the x and y axis
- Introduce slope

Evidence of Learning

Summative Assessment: Performance Task Assessments

Formative Assessments:

- ST Math
- Teacher observation
- Notebook check
- Class participation
- Problem of the Day

Lesson Plans

Activities/Interdisciplinary Connections	*Timeframe*
• Basic Skills Worksheets from various sources • ST Math	Weeks 18-22
Teacher Resources	*Teacher Note*
• Teacher Supplemental Binder	

Differentiating Instruction: Students with Disabilities, English Language Learners, and Gifted & Talented Students

Examples of Strategies and Practices that Support Students with Disabilities:
• Use of visual and multisensory formats
• Use of assisted technology
• Use of prompts
• Modification of content and student products
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• Authentic assessments

Examples of Strategies and Practices that Support Gifted & Talented Students:
• Adjusting the pace of lessons
• Curriculum compacting
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• Independent study
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• Student-driven instruction
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Examples of Strategies and Practices that Support English Language Learners:
• Pre-teaching of vocabulary and concepts
• Visual learning, including graphic organizers
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• Scaffolding •Word walls •Sentence frames •Think-pair-share •Cooperative learning groups

Mathematics- Grade 8 Foundations Unit 4

Unit Title: Equations

Unit Summary: All students will write and simplify expressions and solve multi-step equations.

Primary Interdisciplinary Connections: Financial Literacy and Technology

21st Century Career and Life Themes: Financial, Economic, Business, and Entrepreneurial Literacy

Learning Targets

NJSLS Standards: 7.EE.A.1, 7.EE.B.3

Technology Standards: 8.1.5.A.1

Content Statements:

1	Two-step Equations
2	Multi-Step Equations
3	Distributive Property

Big Idea: Problem solving requires higher order thinking skills and a strategies to deconstruct and solve problems.

Unit Essential Questions:	Unit Enduring Understandings:
• How do you solve equations containing multiple operations and variables?	• Apply properties of operations as strategies to add and subtract expressions with coefficients. • Rewrite expressions in different forms to solve problems. • Apply inverse operations to solve for an unknown variable in an equation.

Unit Learning Targets

Students will…

- Solve two-step equations using addition, subtraction, multiplication, and division.
- Solve multi-step real life and mathematical equations.
- Use the distributive property to solve numerical expressions and equations.
- Translate and write equivalent expressions by applying properties.
- Solve multi-step equations by applying properties of rational numbers

Evidence of Learning

Summative Assessment: Performance Task Assessments

Formative Assessments:

- ST Math
- Teacher observation
- Notebook check
- Class participation
- Problem of the Day

Lesson Plans

Activities/Interdisciplinary Connections	*Timeframe*
• Basic Skills Worksheets from various sources • ST Math	Weeks 23-30
Teacher Resources	*Teacher Note*
• Teacher Supplemental Binder	

Differentiating Instruction: Students with Disabilities, English Language Learners, and Gifted & Talented Students

Examples of Strategies and Practices that Support Students with Disabilities:
• Use of visual and multisensory formats
• Use of assisted technology
• Use of prompts
• Modification of content and student products
• Testing accommodations
• Authentic assessments

Examples of Strategies and Practices that Support Gifted & Talented Students:
• Adjusting the pace of lessons
• Curriculum compacting
• Inquiry-based instruction
• Independent study
• Higher-order thinking skills
• Interest-based content
• Student-driven instruction
• Real-world problems and scenarios

Examples of Strategies and Practices that Support English Language Learners:
• Pre-teaching of vocabulary and concepts
• Visual learning, including graphic organizers
• Use of cognates to increase comprehension
• Teacher modeling
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• Scaffolding •Word walls •Sentence frames •Think-pair-share •Cooperative learning groups

Mathematics- Grade 8 Foundations Unit 5

Unit Title: Word Problems

Unit Summary: All students will systematically deconstruct a word problem and utilize various strategies to solve it.

Primary Interdisciplinary Connections: Financial Literacy and Technology

21st Century Career and Life Themes: Financial, Economic, Business, and Entrepreneurial Literacy

Learning Targets

NJSLS Standards: 7.NS.3, 8.EE.C.7

Technology Standards: 8.1.5.A.1

Content Statements:

1	Solve real-world and mathematical problems involving the four operations with rational numbers.
2	Make sense of problems and persevere in solving them.
3	Apply problem solving strategies.

Big Idea: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations to solve.

Unit Essential Questions:	**Unit Enduring Understandings:**
• How do I know where to begin when solving a problem? • How do I decide what strategy will work best in a given problem situation?	• A problem solver understands what has been done, knows why the process was appropriate, and can support it with reason and evidence.

Unit Learning Targets

Students will…

- Identify the information needed.
- Identify the correct operation.
- Set up the math problem using various problem-solving strategies.
- Accurately complete the mathematical equation.

Evidence of Learning

Summative Assessment: Performance Task Assessments

Formative Assessments:

- ST Math
- Teacher observation

- Notebook check
- Class participation
- Problem of the Day

Lesson Plans

Activities/Interdisciplinary Connections	*Timeframe*
• Basic Skills Worksheets from various sources • ST Math	Weeks 23-30
Teacher Resources	*Teacher Note*
• Teacher Supplemental Binder	

Differentiating Instruction: Students with Disabilities, English Language Learners, and Gifted & Talented Students

Examples of Strategies and Practices that Support Students with Disabilities:
• Use of visual and multisensory formats
• Use of assisted technology
• Use of prompts
• Modification of content and student products
• Testing accommodations
• Authentic assessments

Examples of Strategies and Practices that Support Gifted & Talented Students:
• Adjusting the pace of lessons
• Curriculum compacting
• Inquiry-based instruction
• Independent study
• Higher-order thinking skills
• Interest-based content
• Student-driven instruction
• Real-world problems and scenarios

Examples of Strategies and Practices that Support English Language Learners:
• Pre-teaching of vocabulary and concepts
• Visual learning, including graphic organizers
• Use of cognates to increase comprehension
• Teacher modeling
• Pairing students with beginning English language skills with students who have more advanced English language skills
• Scaffolding
•Word walls
•Sentence frames

•Think-pair-share •Cooperative learning groups

Mathematics- Grade 8 Foundations Unit 6

Unit Title: Financial Literacy- Investing, Credit, Taxes

Unit Summary: Students will be introduced to the world of investing by exploring the mechanics of investing in the stock market. We will begin by learning about the difference between private and public companies, why some private companies elect to become public, and what being public means/entails. Students will then explore the process of becoming public and learn about such concepts as; IPO, stock, stock symbols, stock exchanges, what influences the price of a stock, dividends, and stock splits.

Students will be introduced to the concept of credit- what it is and why it is important. We will first explore the significance of credit from a global perspective, after which we will drill down to identify the significance of credit on a personal level. Along the way, students will learn about various forms of credit including; mortgages, student loans, auto loans, and credit cards. Discussions will identify the advantages and potential pitfalls of managing credit. Other concepts covered include; how do credit card companies make money, the consequences of only paying the minimum on your credit card balance, FICO scores, and bankruptcy.

Students will learn various forms of taxes including; income, sales, and property taxes. While discussing income tax, students will learn what entities tax their income, the difference between gross and net income, how to lower your taxable income, and how the government spends the tax revenues. Additionally, students will gain an understanding of how federal tax is the same from state to state, yet the state income tax varies widely by state. When discussing property tax, we will analyze the components of property tax to determine how this tax is calculated, as well as, compare property tax rates across the country.

Primary Interdisciplinary Connections: Mathematics, Business, Technology

21st Century Career and Life Themes: Global Awareness, Financial Economic, Business and Entrepreneurial Literacy, Life and Career Skills, Information Literacy

Learning Targets

NJSLS Standards: PFL.9.1.8.A.1-7, PFL.9.1.8.B.1-11, PFL.9.1.8.C.1-10, PFL9.1.8.D.1-5, PFL.9.1.8.F.1-3

Technology Standards: 8.1.5.A.1

Content Statements:

1	Understand and synthesize key economic concepts
2	Comprehend various investing terms and concepts
3	Evaluate stock
4	Purchase stock in a mock stock portfolio
5	Understand credit on a global and personal level
6	Identify different forms of credit and the pros/cons of using it
7	Comprehend what a credit score is and how it is calculated
8	Calculate the financial consequences of not paying your credit loan on time

9	Gross salary vs. net income in New Jersey
10	Entities that tax income
11	Income tax state by state
12	Government use of tax revenue
13	Sales tax
14	Property tax

Big Idea: Financial literacy is a practical and relevant topic that introduces students to a variety of financial concepts and strategies. Students will acquire an elevated level of financial competency and sophistication which they will be able to apply to their daily lives. Exploring investment options will allow students to understand opportunities beyond banking products. Understanding the pros/cons to credit can maintain and/or increase your standard of living.

Unit Essential Questions:

- What is the stock market and how does it work?
- Why is it important to have some of your money invested in stocks?
- What are 401k and IRA plans and what benefits do they provide?
- What is credit and why is it important both globally and personally?
- What are the benefits and potential pitfalls in using credit?
- How can someone responsibly manage credit?
- What is the difference between gross and net salary?
- What are the different forms of tax that an individual will pay and what entities are taxing them?
- What are the tax revenues used to pay for?

Unit Enduring Understandings:

- It is beneficial to have some of your money invested in the stock market to ensure diversification and to outpace inflation.
- It is important to have diversification with your investments.
- Investing in 401k and/or IRAs provide tax sheltered, long-term growth opportunities.
- If responsibly managed, using credit can increase your purchasing power and standard of living.
- Paying the minimum monthly payment on a credit card will significantly increase your debt.
- Maintaining a high credit score (FICO) is significant and can benefit you in many ways including; lower interest rates, loan approval, renting an apartment, buying a home, buying a car, getting a job.
- Income tax significantly affects your take home pay (net income).
- New Jersey has the highest property tax in the United States.
- There are legal ways to lower your taxable income (deductions).

Unit Learning Targets

Students will…

- Understand and synthesize how key economic concepts affect their planning and decision-making as it relates to investing
- Comprehend various investing terms and concepts including 401k plans, IRAs, public vs. private companies, IPOs, stock prices, dividends, stock splits

- Research to gather and evaluate different stocks' information, prices, and performance
- Research, analyze and purchase stocks in a mock stock portfolio
- Understand what credit is and its significance both globally and on a personal basis
- Identify the different forms of credit and compare/contrast
- Understand the pros and cons of using credit (potential pitfalls)
- Determine the process by which credit is extended
- Comprehend what a credit score is and how it is calculated
- Appreciate the importance of maintaining a high credit score
- Calculate the financial consequences of not paying your credit on time
- Comprehend the difference between gross salary (income) and net income in New Jersey
- Understand what entities tax their income
- Calculate the amount of taxes taken out of their income as a New Jersey resident
- Understand the difference in state income taxes
- Calculate the amount of taxes taken out of different salaries and compare among states
- Understand how both the Federal and State governments utilize the tax revenues
- Understand other forms of taxes that individuals pay including; sales and property tax
- Determine how property tax is calculated

Evidence of Learning

Summative Assessment: Performance Task Assessments, quizzes and tests developed by teacher

Formative Assessments:

- Stock research sheet
- Stock portfolio activity
- Debt ratio worksheet
- True cost of paying worksheet
- Gross vs. Net – NJ worksheet
- Gross vs. Net- states worksheet
- Disposable income worksheet
- Teacher observation
- Notebook check
- Class participation

Lesson Plans

Activities/Interdisciplinary Connections	*Timeframe*
• Students will complete an activity that requires them to research various companies (stocks) and gather relevant information about each including: stock symbol, exchange, current price, YTD return %, 10 year return	Weeks 35-38 or integrated throughout the course

%. • Working with a partner, students will research and select a portfolio of stocks to invest in given comprehension research parameters. Throughout the remainder of the course, there will be designated trading days where students will buy/sell stocks with the objective of maximizing their portfolio returns. • Students will compete in the Stock Market Game. • Students will complete an activity on bankrate.com to determine the consequence of paying the minimum on their credit card. • Students will complete an activity to determine the debt ratio of a fictitious family to determine whether or not the family would be approved for a loan. • Students will complete an activity comparing the difference between gross and net income (after Federal and State tax) between a single vs. married couple within New Jersey. • Students will complete an activity calculating the net income (after Federal and State tax) of various gross salaries across multiple states to see the difference among them. • Students will calculate disposable income after factoring in Federal and State taxes, along with mortgage expense.	
Teacher Resources	*Teacher Note*
• Bankrate.com • Click on April 2019 MS Personal Finance Tool resources (provided by the NJDOE) for lesson resources • Click on Guidance on Middle School Personal Financial Literacy Requirement	 April 2019 MS Personal Finance Tool  Guidance on Middle School Personal Finan

Differentiating Instruction: Students with Disabilities, English Language Learners, and Gifted & Talented Students

Examples of Strategies and Practices that Support Students with Disabilities:
• Use of visual and multisensory formats
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Examples of Strategies and Practices that Support Gifted & Talented Students:
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