

Clinton-Glen Gardner School District



Curriculum Management System

Algebra I

*** For adoption by all regular education programs as specified and for adoption or adaptation by all Special Education Programs in accordance with Board of Education Policy #220**

Board Approved: November 18, 2020

CLINTON-GLEN GARDNER SCHOOL DISTRICT

ADMINISTRATION

Dr. Seth Cohen, Superintendent/Principal
Mrs. Bernadette Wang, Business Administrator
Mrs. Jacqueline Turner, Assistant Principal
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Clinton-Glen Gardner School District

Mission

The Clinton-Glen Gardner School District, a community who values traditions, nurtures and cultivates each child to be a compassionate, curious, and creative thinker entrusted and empowered to build and lead the future.

Philosophy

The economy in which graduates of our schools will seek employment is more competitive than ever and is rapidly changing in response to advances in technology. To compete in today's global, information-based economy, students must be able to solve real problems, reason effectively, and make logical connections. In this changing world those who have a good understanding of mathematics will have many opportunities and doors open to them throughout their lives. Today's workforce requires mathematical knowledge and skills in areas such as data analysis, problem-solving, pattern recognition, statistics and probability; therefore, our school's curriculum must prepare students for these expectations.

The Clinton-Glen Gardner School is committed to providing all students with the opportunity and the support necessary to learn significant mathematics with depth and understanding. To that end, students will engage in a wide variety of learning activities designed to develop their ability to reason and solve complex problems. Calculators, computers, manipulatives, technology, and the Internet will be used as tools to enhance learning and assist in problem solving. Group work, projects, literature, and interdisciplinary activities will make mathematics more meaningful and aid understanding. Classroom instruction will be designed to meet the learning needs of all children and will reflect a variety of learning styles.

The math curriculum fosters students who:

- Develop computational, conceptual, problem-solving and reasoning skills
- Demonstrate their understanding of mathematical concepts based on higher levels of mathematical thought
- Use technology and other tools as an integral part of solving mathematical problems

New Jersey State Department of Education New Jersey Learning Standards

Intent and Spirit of the New Jersey Mathematics Learning Standards

For more than a decade, research studies of mathematics education in high-performing countries have concluded that mathematics education in the United States must become substantially more focused and coherent in order to improve mathematics achievement in this country. To deliver on this promise, the mathematics standards are designed to address the problem of a curriculum that is "a mile wide and an inch deep."

The math standards provide **clarity and specificity** rather than broad general statements. The standards draw on the most important international models for **mathematical practice**, as well as research. They endeavor to follow the design envisioned by William Schmidt and Richard Houang (2002), by not only **stressing conceptual understanding** of key ideas, but also by continually returning to organizing principles (coherence) such as place value and the laws of arithmetic to structure those ideas.

In addition, the "sequence of topics and performances" that is outlined in a body of math standards must respect what is already known about how students learn. As Confrey (2007) points out, developing "sequenced obstacles and challenges for students...absent the insights about meaning that derive from careful study of learning, would be unfortunate and unwise." Therefore, the development of the standards began with research-based learning progressions detailing what is known today about how students' mathematical knowledge, skill, and understanding develop over time. The knowledge and skills students need to be prepared for mathematics in college, career, and life are woven throughout the mathematics standards.

Mathematics: Standards for Mathematical Practice Interpreted

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with long standing importance in mathematics education. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation and connections. The second are the strands of mathematical proficiency specified in the National Research Council's report *Adding It Up*: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately) and productive disposition (habitual inclination to see mathematics as sensible, useful and worthwhile, coupled with a belief in diligence and one's own efficacy).

The Standards for Mathematical Practice are:

1. **MAKE SENSE OF PROBLEMS AND PERSEVERE IN SOLVING THEM.**

As you look at or read a mathematical problem, think about what it means and what it is asking you to do. Also think about what would be a good way to start solving it. Ask yourself:

- What does the problem tell me?
 - What information is given?
 - What are the relationships among parts of the problem?
 - What is the goal of solving the problem?
 - Have I seen other problems similar to this one?
- What does the problem ask me to find out (solve)?
- How should I start solving the problem?
- Can pictures or a drawing help me to figure out how to solve the problem?
- Does how I'm answering the problem make sense with what the problem is asking?
- What are some other ways to solve the problem?
- Can I use another way to check if my answer is correct?
- Does my answer make sense?

2. REASON ABSTRACTLY AND QUANTITATIVELY.

Understand the relationship of numbers and number problems and represent them using pictures, drawings or symbols. Talk about the parts of number problems using pictures, drawings or symbols as well as how the pictures, drawings or symbols represent and help explain the problem. Show how using different numbers or operations in the same problem changes it.

3. CONSTRUCT VIABLE ARGUMENTS AND CRITIQUE THE REASONING OF OTHERS.

Use objects, drawings, diagrams or actions to construct arguments about math problems with understanding and using appropriate vocabulary to explain the reasoning process. Build a local argument, communicate it with others, justify your reasoning process and respond to the reasoning process someone else uses. Express agreement if both arguments are correct and explain why an argument is flawed if it is.

4. MODEL WITH MATHEMATICS.

Apply mathematical skills to everyday life, society, the workplace and other situations; identify important quantities in practical situations; write an equation to describe a situation; revise solutions; use tools such as diagrams, two-way tables, graphs, flowcharts and formulas to show relationships; analyze relationships to draw conclusions, interpret results in context and reflect on whether the results make sense.

5. USE APPROPRIATE TOOLS STRATEGICALLY.

Identify and make decisions regarding which tool, such as paper and pencil, models, rulers, spreadsheets, etc., to use to help solve mathematical problems as well as know when a tool is not the right one to use. Use technological and other tools to deepen understanding.

6. ATTEND TO PRECISION.

Communicate precisely when discussing math incorporating the following:

- Use clear definitions.
- Choose, use and explain symbols correctly, consistently and appropriately.
- Specify units of measure and labels correctly.
- Avoid careless errors.
- Follow formulas to explain thinking to others.

7. LOOK FOR AND MAKE USE OF STRUCTURE.

Look for and identify structure and patterns in mathematics (for example, three and seven more is the same amount as seven and three more, or sort shapes according to their number of sides) and see if the pattern or structure changes.

8. LOOK FOR AND EXPRESS REGULARITY IN REPEATED REASONING.

Look for repetition in calculations and numeric thinking, such as skip counting. Pay attention to the whole problem and the details and continuously evaluate the accuracy and reasonableness of both intermediate and final answers.

CONNECTING THE STANDARDS FOR MATHEMATICAL PRACTICE TO THE STANDARDS FOR MATHEMATICS CONTENT

The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years. Designers of curricula, assessments and professional development should all attend to the need to connect the mathematical practices to mathematical content in mathematical instruction. The Standards for Mathematical Content are a balanced combination of procedure and understanding. Expectations that begin with the word “understand” are often especially good opportunities to connect the practices to the content. Students who lack understanding of a topic may rely on procedures too heavily. Without a flexible base from which to work, they may be less likely to consider analogous problems, represent problems coherently, justify conclusions, apply the mathematics to practical situations, use technology mindfully to work with the mathematics, explain the mathematics accurately to other students, step back for an overview or deviate from a known procedure to find a shortcut. In short, a lack of understanding effectively prevents a student from engaging the mathematical practices. In this respect those content standards, which set an expectation of understanding are potential “points of intersection” between the Standards for Mathematical Content and the Standards for Mathematical Practice. These points of intersection are intended to be weighted toward central and generative concepts in the school mathematics curriculum that most merit time, resources, innovative energies and focus necessary to qualitatively improve the curriculum, instruction, assessment, professional development and student achievement in mathematics.

**Grade 8
Mathematics – Algebra
Scope and Sequence**

**Quarter I: 21st Century Skills and Themes
September through December (approximately 60 days)**

1. **Critical Thinking & Problem Solving**
2. **Communication & Collaboration**
3. Media Literacy
4. Information Literacy
5. Information, Communication & Technology

Topic: Seeing Structure in Expressions

- I. Numbers, Variables and Expressions
 - a. Real numbers
 - i. Classifying
 - ii. Comparing
 - iii. Graphing
 - b. Numeric expressions
 - i. Simplifying
 - c. Algebraic expressions
 - i. Simplifying
 - ii. Exponents

Topic: Creating and Reasoning with Equations

- II. Equations
 - a. Simple equations
 - i. Infinite solutions
 - ii. No solution
 - iii. Real world applications
 - b. Multi-step equations
 - i. Infinite solutions
 - ii. No solution
 - iii. Real world applications

Topic: Ratios and Proportional Relationships

- III. Ratios, Proportions and Percents
 - a. Rates and ratios
 - b. Unit conversion
 - i. Dimensional analysis
 - c. Proportions
 - i. Similar figures
 - ii. Percents
 - d. Percent
 - i. Translation to equations
 - e. Simple interest

Topic: Creating and Reasoning with Inequalities

- IV. Inequalities
 - a. Simple inequalities
 - i. Solve
 - ii. Graph
 - b. Multi-step inequalities
 - i. Solve
 - ii. Graph
 - c. Compound inequalities
 - i. Graph
 - ii. Intersections
 - iii. Unions
 - d. Absolute value equations
 - i. Solve
 - ii. Graph

Assessments

Formative: • Group Work • Individual Work • Partner Work • Worksheets • Quizzes • Exams • Homework • Oral Questions • Student Participation • Projects

Summative: Teacher observation • Student participation • Tests/Exams • Quizzes • Projects

District Benchmark: Link-It

Alternative Assessments: Various Performance Assessments designed with student input

Core Instructional Materials and Supplemental Materials

Pearson Algebra I Textbook and Teacher Edition

Blackline masters

Manipulatives

Textbook website

Calculators (graphing/scientific)

Text/Resource Books, Internet, Worksheets, Teacher Manual, DVDs, Manipulatives

Word Wall

Smartboard lessons

Calculator

Teacher-made materials

Interactive number lines (SmartBoard gallery)

www.khanacademy.org

www.studyisland.com

www.aaamath.com

Interdisciplinary Connections

Science MS-PS1-5. Develop and use a model to describe how the total number of atoms does not change in a chemical reaction and thus mass is conserved.

MS-PS1-1 Scale, Proportion, and Quantity ♣ Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.

ELA Anchor Standards for History, Science, and Technical Subjects

Key Ideas and Details

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

RH.6-8.2. Determine the central ideas or information of a primary or secondary source; provide an accurate summary of the source distinct from prior knowledge or opinions.

RST.6-8.1. Cite specific textual evidence to support analysis of science and technical texts.

RST.6-8.2. Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

Craft and Structure

RST.6-8.4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 6-8 texts and topics*.

RST.6-8.5. Analyze the structure an author uses to organize a text, including how the major sections contribute to the whole and to an understanding of the topic.

RST.6-8.6. Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text.

Integration of Knowledge and Ideas

RST.6-8.7. Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

RST.6-8.8. Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

WHST.6-8.1. Write arguments focused on *discipline-specific content*.

- A. Introduce claim(s) about a topic or issue, acknowledge and distinguish the claim(s) from alternate or opposing claims, and organize the reasons and evidence logically.
- B. Support claim(s) with logical reasoning and relevant, accurate data and evidence that demonstrate an understanding of the topic or text, using credible sources.
- C. Use words, phrases, and clauses to create cohesion and clarify the relationships among claim(s), counterclaims, reasons, and evidence.

- D. Establish and maintain a formal/academic style, approach, and form.
- E. Provide a concluding statement or section that follows from and supports the argument presented.

Career Education & Financial Literacy Integration of 21st Century Skills (NJSL 9)

9.1.8.C.1 Compare and contrast credit cards and debit cards and the advantages and disadvantages of using each. 9.1.8.C.2 Compare and contrast the financial products and services offered by different types of financial institutions. 9.1.8.C.3 Compare and contrast debt and credit management strategies 9.1.8.D.1 Determine how saving contributes to financial well-being. 9.1.8.D.2 Differentiate among various savings tools and how to use them most effectively. 9.2.8.B.1 Research careers within the 16 Career Clusters® and determine attributes of career success. 9.2.8.B.2 Develop a Personalized Student Learning Plan with the assistance of an adult mentor that includes information about career areas of interest, goals and an educational plan.

Model Curriculum – Personal Financial Literacy Lesson Plans

- [Lesson 4: The Impact of Inflation](#)
- [Lesson 5: Monetary Transaction Tools](#)
- [Lesson 6: Taxes: The Price That People Pay for Public Benefits](#)
- [Lesson 7: Protecting Your Future: Property and Liability Insurance](#)
- [Lesson 8: How Health Insurance Works](#)
- [Lesson 9: Values, Goals, and Financial Decisions](#)
- [Lesson 10: Spending Plan/Budget: Your Financial Road Map](#)
- [Lesson 11: Interest: The Cost of Borrowing Money](#)

- **CRP1 - Act as a responsible and contributing citizen and employee.**
- **CRP2 - Apply appropriate academic and technical skills.**
- **CRP4 Communicate clearly and effectively and with reason.**
- **CRP5 Consider the environmental, social and economic impacts of decisions.**
- **CRP6 Demonstrate creativity and innovation.**
- **CRP7 Employ valid and reliable research strategies**
- **CRP8 Utilize critical thinking to make sense of problems and persevere in solving them.**
- **CRP11 Use technology to enhance productivity.**

During Career Day, students are visited by professionals who explain how math has helped them in their career.

Technology Standards 8

8.1.8.A.2 Create a document (e.g. newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications to be critiqued by professionals for usability.

8.1.8.A.3 Use and/or develop a simulation that provides an environment to solve a real world problem or theory.

8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results

8.1.8.A.5 Create a database query, sort and create a report and describe the process, and explain the report results.

Identify and define authentic problems and significant questions for investigation.

Plan and manage activities to develop a solution or complete a project.

8.2.8.A.1

Research a product that was designed for a specific demand and identify how the product has changed to meet new demands (i.e. telephone for communication - smart phone for mobility needs).

8.2.8.A.2

Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system.

The relationships among technologies and the connections between technology and other fields of study.

Quarter II
December through March (approximately 60 days)
21st Century Skills and Themes

1. **Creativity & Innovation** Global Awareness
2. **Financial, Economic, Business and Entrepreneurial Literacy**
3. **Civic Literacy**
4. Health Literacy
5. Environmental Literacy

Topic: Interpreting Functions

- V. Introductions to Functions
 - a. Mathematical representations
 - i. Graph
 - ii. Tables
 - iii. Expressions
 - b. Linear and non-linear functions
 - i. Identification
 - ii. Function notation
 - iii. Domain
 - c. Patterns in sequence
 - i. Identification
 - ii. Extension

Topic: Interpreting and Building Functions

- VI. Linear Relationships
 - a. Linear functions
 - i. Characteristics
 - ii. Multiple representations
 - iii. Graph
 - Slope intercept form
 - Point slope form
 - Standard form
 - b. Rates of change
 - i. Tables
 - ii. Graphs
 - c. Domain
 - d. Equations of direct variation
 - i. Construct
 - ii. Graph
 - e. Lines
 - i. Parallel
 - ii. Perpendicular
 - iii. Equations
 - f. Explicit expressions
 - g. Recursive processes
 - h. Steps for calculation

Topic: Creating and Reasoning with Equations & Inequalities

VII. Systems of Equations and Inequalities

- a. Systems of equations
 - i. Graphing
 - ii. Substitution
 - iii. Linear combinations
 - iv. Infinite solutions
 - v. No solution
- b. Systems or linear inequalities
 - i. Graphing
 - ii. Viable/nonviable options

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MS-PS1-1 Scale, Proportion, and Quantity ♣ Time, space, and energy phenomena can be observed at various scales using models to study systems that are too large or too small.

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Quarter III: 21st Century Skills and Themes
March through June (approximately 60 days)
21st Century Skills and Themes

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2. **Financial, Economic, Business and Entrepreneurial Literacy**
3. **Civic Literacy**
4. **Health Literacy**
5. Environmental Literacy

Topic: Linear, Quadratic and Exponential Models

VIII. Exponents and Exponential Functions

- a. Exponents
 - i. Multiplication and division
 - ii. Power to a power
 - iii. Product/quotient to a power
- b. Exponential functions
 - i. Graph
 - ii. Comparisons to linear functions
 - iii. Growth and decay
 - iv. Construction from graphs, descriptions, input/output pairs

Topic: Arithmetic with Polynomials and Expressions

IX. Polynomials and Factoring

- a. Polynomials
 - i. Classification
 - ii. Addition and subtraction
 - iii. Multiplication
- b. Factoring
 - i. Monomial from polynomial
 - ii. Trinomials
 - perfect square
 - iii. Graphing

Topic: Interpreting Functions

X. Quadratic Functions and Equations

- a. Quadratic equations
 - i. Transformation
 - ii. Complete the square
 - iii. Quadratic formula
- b. Quadratic functions
 - i. Solve
 - Graphing
 - Factoring
 - Square roots
 - Zeros, extreme values and symmetry

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| <p>Topic: Interpreting Categorical and Quantitative Data</p> <p>XI. Data Analysis and Probability</p> <ul style="list-style-type: none"> a. Matrices <ul style="list-style-type: none"> i. Data organization ii. Addition, subtraction and multiplication b. Data set comparisons <ul style="list-style-type: none"> i. Shape ii. Center iii. Spread iv. Mean v. Standard deviation c. Measures of central tendency d. Probability <ul style="list-style-type: none"> i. Theoretical and experimental ii. Events <ul style="list-style-type: none"> - Independent/dependent - Exclusive/overlapping | <p>Topic: Reasoning with Equations</p> <p>XII. Radical Expressions and Equations</p> <ul style="list-style-type: none"> a. Pythagorean Theorem b. Radicals <ul style="list-style-type: none"> i. Standard form ii. Simplifying iii. Addition, subtraction, multiplication and division |
| <p>Topic: Arithmetic with Polynomials and Radical Expressions</p> <p>XIII. Rational Expressions and Equations</p> <ul style="list-style-type: none"> a. Rational expressions <ul style="list-style-type: none"> i. Simplify ii. Addition and subtraction iii. Multiplication and division | <p>Topic: Financial Literacy</p> <p>XIV. Credit and Debt Management</p> <ul style="list-style-type: none"> a. Credit cards b. Savings strategies c. Identity protection d. Financial products and services e. Interest rates f. Bankruptcy |
| <p>Assessments</p> <p>Formative: • Group Work • Individual Work • Partner Work • Worksheets • Quizzes • Exams • Homework • Oral Questions • Student Participation • Projects</p> <p>Summative: Teacher observation • Student participation • Tests/Exams • Quizzes • Projects</p> <p>District Benchmark: Link-It</p> <p>Alternative Assessments: Various Performance Assessments designed with student input</p> | |

Core Instructional Materials and Supplemental Materials

Prentice Hall Grade 8 Textbook
Go Math Reteach Activities
Go Math Enrichment Activities
Go Math Personal Math Trainer Online Activities
Go Math Interactive Whiteboard Activities
Go Math STEM Activities
Go Math *Getting Ready for the NJSLA Assessments*
Text/Resource Books, Internet, Worksheets, Teacher Manual, DVDs, Manipulatives
Word Wall
Smartboard lessons
Calculator
Teacher-made materials
Interactive number lines (SmartBoard gallery)

www.khanacademy.org

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- N. Establish and maintain a formal/academic style, approach, and form.
- O. Provide a concluding statement or section that follows from and supports the argument presented.

Career Education & Financial Literacy Integration of 21st Century Skills (NJSL 9)

9.1.8.C.1 Compare and contrast credit cards and debit cards and the advantages and disadvantages of using each. 9.1.8.C.2 Compare and contrast the financial products and services offered by different types of financial institutions. 9.1.8.C.3 Compare and contrast debt and credit management strategies 9.1.8.D.1 Determine how saving contributes to financial well-being. 9.1.8.D.2 Differentiate among various savings tools and how to use them most effectively. 9.2.8.B.1 Research careers within the 16 Career Clusters® and determine attributes of career success. 9.2.8.B.2 Develop a Personalized Student Learning Plan with the assistance of an adult mentor that includes information about career areas of interest, goals and an educational plan.

Model Curriculum – Personal Financial Literacy Lesson Plans

- [Lesson 4: The Impact of Inflation](#)
- [Lesson 5: Monetary Transaction Tools](#)
- [Lesson 6: Taxes: The Price That People Pay for Public Benefits](#)

- [Lesson 7: Protecting Your Future: Property and Liability Insurance](#)
- [Lesson 8: How Health Insurance Works](#)
- [Lesson 9: Values, Goals, and Financial Decisions](#)
- [Lesson 10: Spending Plan/Budget: Your Financial Road Map](#)
- [Lesson 11: Interest: The Cost of Borrowing Money](#)

- **CRP1 - Act as a responsible and contributing citizen and employee.**
- **CRP2 - Apply appropriate academic and technical skills.**
- **CRP4 Communicate clearly and effectively and with reason.**
- **CRP5 Consider the environmental, social and economic impacts of decisions.**
- **CRP6 Demonstrate creativity and innovation.**
- **CRP7 Employ valid and reliable research strategies**
- **CRP8 Utilize critical thinking to make sense of problems and persevere in solving them.**
- **CRP11 Use technology to enhance productivity.**

During Career Day, students are visited by professionals who explain how math has helped them in their career.

Technology Standards 8

8.1.8.A.2 Create a document (e.g. newsletter, reports, personalized learning plan, business letters or flyers) using one or more digital applications to be critiqued by professionals for usability.

8.1.8.A.3 Use and/or develop a simulation that provides an environment to solve a real world problem or theory.

8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results

8.1.8.A.5 Create a database query, sort and create a report and describe the process, and explain the report results.

Identify and define authentic problems and significant questions for investigation.

Plan and manage activities to develop a solution or complete a project.

8.2.8.A.1

Research a product that was designed for a specific demand and identify how the product has changed to meet new demands (i.e. telephone for communication - smart phone for mobility needs).

8.2.8.A.2

Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system.

The relationships among technologies and the connections between technology and other fields of study.

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| Suggested days of Instruction | Curriculum Management System Subject/Grade Level: Grade 8 Mathematics - Algebra | Topic: Numbers, Variables and Expressions | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>Review prerequisite concepts including, but not limited to:</p> <ul style="list-style-type: none"> -classifying, graphing and comparing real numbers -identifying and using properties of operations and relationships -simplifying numeric expressions using all four operations <p>(A-SSE.1.a, A-SSE.2)</p> <p>1.1. Write algebraic expressions. (A-SSE.1.a)</p> <p>1.2. Simplify expressions including expressions with exponents. (A-SSE.2)</p> <p>1.3. Make sense of problems and persevere in solving them. (MP.1)</p> <p>1.4. Reason abstractly and quantitatively. (MP.2)</p> | <p>Essential Questions:</p> <p>How does recognizing, understanding and applying standard rules of math ensure consistent results? How do complex, real-life scenarios require the language of math? What does the language of math look like?</p> <p>Conceptual Understandings:</p> <p>Mathematics is a language of carefully designed terms and symbols.</p> <p>Mathematics is used to make informed decisions about problems in every day life.</p> | <p>Pearson Algebra I chapter 1</p> <p>Unit Vocabulary: additive inverse, expression, integer, like terms, real number, variable</p> <p>Assessment Models:</p> <p>Homework Checkpoints Observation Questioning strategies Quizzes Tests Projects</p> <p>Opportunities for Differentiation:</p> <p>Cooperative group work Assignments and assessments differentiated for ability and/or interest</p> <p>Additional Resources:</p> <p>Textbook Related resources Blackline masters Manipulatives Textbook website Calculators (graphing/scientific)</p> |

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| Suggested days of Instruction | Curriculum Management System <u>Subject/Grade Level:</u> Grade 8 Mathematics - Algebra | Topic: Numbers, Variables and Expressions | |
| | | <u>Goal 1:</u> The student will explore the basic language of algebra. Topics include writing and simplifying numeric and algebraic expressions. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | 1.5. Develop strategies to reinforce positive attitudes and productive behaviors that impact critical thinking and problem-solving skills. (9.1.8.A.1) | | |

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| Suggested days of Instruction | Curriculum Management System | Topic: Equations | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 2: The student will explore techniques for solving and applying equations in one variable. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>2.1. Solve simple and multi-step equations in one variable. (A-REI.1, A-REI.3)</p> <p>2.2. Solve equations with variables on both sides in one variable. (A-REI.1, A-REI.3)</p> <p>2.3. Identify and solve equations that have an infinite number of solutions or no solutions. (A-REI.1, A-REI.3)</p> <p>2.4. Rewrite and use literal equations. (A-CED.4)</p> <p>2.5. Apply and solve equations related to real-world situations. (A-CED.1)</p> <p>2.6. Make sense of problems and persevere in solving them. (MP.1)</p> | <p>Essential Questions: What is the mathematical language of balance? How are equations used to find something you don't know from something you don't know? How are equations related to symmetry?</p> <p>Conceptual Understandings: Mathematics is a language of carefully designed terms and symbols. Mathematics is used to make informed decisions about problems in every day life.</p> | <p>Pearson Algebra I chapter 2</p> <p>Unit Vocabulary: conversion factor, inverse operations, percent change</p> <p>Assessment Models: Homework Checkpoints Observation Questioning strategies Quizzes Tests Projects</p> <p>Opportunities for Differentiation: Cooperative group work Assignments and assessments differentiated for ability and/or interest</p> <p>Additional Resources: Textbook Related resources Blackline masters Manipulatives Textbook website Calculators (graphing/scientific)</p> |

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| Suggested days of Instruction | Curriculum Management System | Topic: Equations | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 2: The student will explore techniques for solving and applying equations in one variable. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>2.7. Reason abstractly and quantitatively. (MP.2)</p> <p>2.8. Determine an individual's responsibility for personal actions and contributions to group activities. (9.1.8.C.1)</p> | | |

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| Suggested days of Instruction | Curriculum Management System Subject/Grade Level: Grade 8 Mathematics - Algebra | Topic: Ratios, Proportions and Percents | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Goal 3: The student will explore comparing numbers and expressions using ratios, proportions and percents. Apply the concepts of proportion and similarity to real-world problems. | Essential Questions, Conceptual Understandings |
| | 3.1. Find rates and ratios. (7.RP.1) 3.2. Convert units and rates including unit or dimensional analysis. (7.RP.1) 3.3. Solve and apply proportions including similar figures and percents. (7.RP.2, 7.RP.2.c, 7.RP.3) 3.4. Solve percent problems by translating to an equation. (7.RP.2, 7.RP.2.c, 7.RP.3) 3.5. Calculate simple interest (in this unit or other applicable unit). (7.RP.3) 3.6. Use appropriate tools strategically. (MP.5) | Essential Questions: How is comparison used to gain knowledge? What does it mean to be equivalent? Conceptual Understandings: Analogies can be quantified. Mathematics is used to make informed decisions about problems in every day life. | Pearson Algebra I chapter 1 Unit Vocabulary: proportion, ratio, rate, scale Assessment Models: Homework Checkpoints Observation Questioning strategies Quizzes Tests Projects Opportunities for Differentiation: Cooperative group work Assignments and assessments differentiated for ability and/or interest Additional Resources: Textbook Related resources Blackline masters Manipulatives Textbook website Calculators (graphing/scientific) |

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| Suggested days of Instruction | Curriculum Management System | Topic: Ratios, Proportions and Percents | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 3: The student will explore comparing numbers and expressions using ratios, proportions and percents. Apply the concepts of proportion and similarity to real-world problems. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | 3.7. Attend to precision. (MP.6) | | |

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| Suggested days of Instruction | Curriculum Management System | Topic: Inequalities | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 4: The student will explore techniques for solving and applying inequalities and compound inequalities in one variable. Illustrate the solution set graphically. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>4.1. Write, graph and identify solutions to inequalities in one variable. (A-REI.3)</p> <p>4.2. Solve simple and multi-step inequalities in one variable. (A-REI.3)</p> <p>4.3. Solve and graph compound inequalities in one variable. (A-REI.3)</p> <p>4.4. Solve and graph absolute value equations and inequalities in one variable. (A-REI.3)</p> <p>4.5. Use intersections and unions of sets when solving compound inequalities. (A-REI.3)</p> <p>4.6. Apply and solve equations related to real-world situations. (A-CED.1)</p> | <p>Essential Questions: How can we communicate situations that are not exact? What is the language of imbalance? How can you communicate that something is between two values?</p> <p>Conceptual Understandings: Things in life are rarely exact. Mathematics is a language of carefully designed terms and symbols. Mathematics is used to make informed decisions about problems in every day life.</p> | <p>Pearson Algebra I chapter 3</p> <p>Unit Vocabulary: complement, compound inequality, disjoint sets, empty set, intersection, union, interval, universal set</p> <p>Assessment Models: Homework Checkpoints Observation Questioning strategies Quizzes Tests Projects</p> <p>Opportunities for Differentiation: Cooperative group work Assignments and assessments differentiated for ability and/or interest</p> <p>Additional Resources: Textbook Related resources Blackline masters Manipulatives Textbook website Calculators (graphing/scientific)</p> |

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| Suggested days of Instruction | Curriculum Management System Subject/Grade Level: Grade 8 Mathematics - Algebra | Topic: Inequalities | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Goal 4: The student will explore techniques for solving and applying inequalities and compound inequalities in one variable. Illustrate the solution set graphically. | Essential Questions, Conceptual Understandings |
| | 4.7. Construct viable arguments and critique the reasoning of others. (MP.3) 4.8. Attend to precision. (MP.6) | | |

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| Suggested days of Instruction | Curriculum Management System Subject/Grade Level: Grade 8 Mathematics - Algebra | Topic: Introduction to Functions | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>5.1. Represent mathematical relationships using graphs, tables, and expressions. (F-IF.1, F-IF.2, F-IF.4)</p> <p>5.2. Identify and represent patterns that describe linear and non-linear functions. (F-IF.1, F-IF.2)</p> <p>5.3. Determine if a relation is a function. (F-IF.1, F-IF.2)</p> <p>5.4. Find domain and range and use function notation. (F-IF.1, F-IF.2)</p> <p>5.5. Identify and extend patterns in sequences. (F-IF.3, F-BF.2)</p> <p>5.6. Represent arithmetic sequences using function notation. (F-IF.3, F-BF.2)</p> | <p>Essential Questions: How do humans explain their world through quantitative representations? How would your life be affected if the machines around you behaved unpredictably?</p> <p>Conceptual Understandings: Mathematics is a language of carefully designed terms and symbols. Mathematics is used to make informed decisions about problems in every day life.</p> | <p>Pearson Algebra I chapter 4</p> <p>Unit Vocabulary: continuous, discrete, domain, range, function, linear function, non-linear function, recursive formula</p> <p>Assessment Models: Homework Checkpoints Observation Questioning strategies Quizzes Tests Projects</p> <p>Opportunities for Differentiation: Cooperative group work Assignments and assessments differentiated for ability and/or interest</p> <p>Additional Resources: Textbook Related resources Blackline masters Manipulatives Textbook website Calculators (graphing/scientific)</p> |

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| Suggested days of Instruction | Curriculum Management System | Topic: Introduction to Functions | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 5: The student will explore mathematical relationships between two variables or attributes using graphs, tables, expressions, and equations with emphasis on functional relationships. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | 5.7. Look for and make use of structure. (MP.7) 5.8. Look for and express regularity in repeated reasoning. (MP.8) | | |

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| Suggested days of Instruction | Curriculum Management System Subject/Grade Level: Grade 8 Mathematics - Algebra | Topic: Linear Relationships | |
| | | Goal 6: The student will explore and model linear relationships using graphs, tables and equations. Compare, analyze, interpret the characteristics of linear relationships when applied to real-world problems. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | 6.1. Represent relationships through equations in two or more variables and create graph of the equations (A-CED.2) 6.2. Find rates of change from a table. (F-IF.6) 6.3. Estimate rate of change from a graph. (F-IF.6) 6.4. Find slope. 6.5. Compare and analyze characteristics of linear functions represented in different ways. (F-IF.9) 6.6. Relate a function's domain to its graph and to the relationship it describes. (F-IF.5) | Essential Questions: Is life a straight line? What types of relationships can be modeled by a straight line? What is the language of linear models? How can real-life situations be represented by linear functions? Conceptual Understandings: Linear models allow us to understand the present and communicate predictions about the future. Mathematics is a language of carefully designed terms and symbols. Mathematics is used to make informed decisions about problems in every day life. | Pearson Algebra I chapter 5 Unit Vocabulary: point-slope form, slope-intercept form, slope, x and y intercept Assessment Models: Homework Checkpoints Observation Questioning strategies Quizzes Tests Projects Opportunities for Differentiation: Cooperative group work Assignments and assessments differentiated for ability and/or interest Additional Resources: Textbook Related resources Blackline masters Manipulatives Textbook website Calculators (graphing/scientific) |

| Suggested days of Instruction | Curriculum Management System | Topic: Linear Relationships | |
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| | <u>Subject/Grade Level:</u> Grade 8 Mathematics - Algebra | Goal 6: The student will explore and model linear relationships using graphs, tables and equations. Compare, analyze, interpret the characteristics of linear relationships when applied to real-world problems. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>6.7. Write and graph an equation of direct variation. (A-REI.10, F-IF.4)</p> <p>6.8. Write and graph linear equations using slope-intercept form, point-slope form, and standard form. (F-IF.4, F-IF.7.a)</p> <p>6.9. Write functions defined by an expression in equivalent forms. (F-IF.8)</p> <p>6.10. Graph functions expressed symbolically. (F-IF.7)</p> <p>6.11. Interpret key features of graphs and tables. (F-IF.4)</p> <p>6.12. Determine whether lines are parallel, perpendicular or neither.</p> <p>6.13. Write equations of parallel and perpendicular lines. (F-BF.1)</p> | | |

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| Suggested days of Instruction | Curriculum Management System Subject/Grade Level: Grade 8 Mathematics - Algebra | Topic: Linear Relationships | |
| | | Goal 6: The student will explore and model linear relationships using graphs, tables and equations. Compare, analyze, interpret the characteristics of linear relationships when applied to real-world problems. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | 6.14. Use context to determine explicit expressions, recursive processes and steps for calculation. (F-BF.1.a) 6.15. Model real-world scenarios with linear functions. (F-BF.1.a) 6.16. Model with mathematics. (MP.4) 6.17. Use appropriate tools strategically. (MP.5) | | |

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| Suggested days of Instruction | Curriculum Management System Subject/Grade Level: Grade 8 Mathematics - Algebra | Topic: Systems of Equations and Inequalities | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>7.1. Solve systems of equations by graphing. (A-REI.6)</p> <p>7.2. Analyze special cases of systems that result in no solution and infinite number of solutions. (A-REI.5)</p> <p>7.3. Solve systems of equations algebraically using substitution and linear combination (adding, subtracting and/or multiplying to eliminate a variable). (A-REI.6)</p> <p>7.4. Model real-world situations using systems of linear equations. (A-CED.3)</p> | <p>Essential Questions: How do you communicate choice? What are some of the factors that go into selecting one solution over another? When do real-world problems have many answers?</p> <p>Conceptual Understandings: The best solution to many problems requires analysis of multiple possibilities. Mathematics is used to make informed decisions about problems in every day life.</p> | <p>Pearson Algebra I chapter 6</p> <p>Unit Vocabulary: dependent, independent, consistent, inconsistent, systems of equations</p> <p>Assessment Models: Homework Checkpoints Observation Questioning strategies Quizzes Tests Projects</p> <p>Opportunities for Differentiation: Cooperative group work Assignments and assessments differentiated for ability and/or interest</p> <p>Additional Resources: Textbook Related resources Blackline masters Manipulatives Textbook website Calculators (graphing/scientific)</p> |

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| Suggested days of Instruction | Curriculum Management System | Topic: Systems of Equations and Inequalities | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 7: The student will explore techniques for solving and applying systems of equations and inequalities. Apply these techniques to solve real-world problems. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>7.5. Explain why the x-coordinates of the points where the graphs of the equations $y=f(x)$ and $y=g(x)$ intersect are the solutions of the equation $f(x)=g(x)$. (A-REI.11)</p> <p>7.6. Graph linear inequalities in two variables. (A-REI.12)</p> <p>7.7. Graph solutions to linear inequalities as a half-plane and the solution set as the intersection of the corresponding half-planes. (A-REI.12)</p> <p>7.8. Solve systems in inequalities by graphing. (A-REI.6)</p> <p>7.9. Model real-world situations using systems of linear inequalities. (A-CED.3)</p> | | |

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| Suggested days of Instruction | Curriculum Management System | Topic: Systems of Equations and Inequalities | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 7: The student will explore techniques for solving and applying systems of equations and inequalities. Apply these techniques to solve real-world problems. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>7.10. Determine if solutions are viable or nonviable options within the context. (A-CED.3)</p> <p>7.11. Model with mathematics. (MP.4)</p> <p>7.12. Use appropriate tools strategically. (MP.5)</p> | | |

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| Suggested days of Instruction | Curriculum Management System Subject/Grade Level: Grade 8 Mathematics - Algebra | Topic: Exponents and Exponential Functions | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>Note: Ensure that students understand scientific notation.</p> <p>8.1. Simplify expressions involving zero and negative exponents. (8.EE.1)</p> <p>8.2. Multiply and divide powers with the same base. (8.EE.1)</p> <p>8.3. Raise a power to a power. (8.EE.1)</p> <p>8.4. Raise a product or quotient to a power. (8.EE.1)</p> <p>8.5. Write a function in equivalent forms to explain different properties of the function. (F-IF.8)</p> <p>8.6. Evaluate and graph exponential functions. (F-IF.8.b)</p> | <p>Essential Questions: How can you communicate ideas that involve very large and very small numbers? Why is it necessary to have so many ways of representing a single number? How do we communicate growth?</p> <p>Conceptual Understandings: Mathematics is a language of carefully designed terms and symbols.</p> | <p>Pearson Algebra I chapter 7</p> <p>Unit Vocabulary: exponential decay, exponential growth, geometric sequence</p> <p>Assessment Models: Homework Checkpoints Observation Questioning strategies Quizzes Tests Projects</p> <p>Opportunities for Differentiation: Cooperative group work Assignments and assessments differentiated for ability and/or interest</p> <p>Additional Resources: Textbook Related resources Blackline masters Manipulatives Textbook website Calculators (graphing/scientific)</p> |

| Suggested days of Instruction | Curriculum Management System | | Topic: Exponents and Exponential Functions | |
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| | <u>Subject/Grade Level:</u> Grade 8 | | <u>Goal 8:</u> The student will explore and model exponential functions using graphs, tables and equations and by applying the rules for operations with exponents. Construct, compare, and analyze exponential functions. | |
| | Mathematics - Algebra | | | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model | |
| | The student will be able to: | | | |
| | <p>8.7. Distinguish situations that can be models with linear functions from those using exponential functions. (F-LE.1)</p> <p>8.8. Model exponential growth and decay. (F-LE.1.a, F-LE.1.c)</p> <p>8.9. Construct linear and exponential functions from graphs, relationship descriptions or two input-output pairs. (F-LE.2)</p> <p>8.10. Determine that exponential growth exceeds a quantity increasing linearly, quadratically, or as a polynomial function. (F-LE.3)</p> <p>8.11. Reason abstractly and quantitatively. (MP.2)</p> <p>8.12. Construct viable arguments and critique the reasoning of others. (MP.3)</p> | | | |

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| Suggested days of Instruction | Curriculum Management System | Topic: Polynomials and Factoring | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 9: The student will explore the techniques to add, subtract, multiply and factor polynomials. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>9.1. Classify polynomials. (A-APR.1)</p> <p>9.2. Add and subtract polynomials. (A-APR.1)</p> <p>9.3. Multiply polynomials including the square of a binomial and sum and difference of the same two terms. (A-APR.1)</p> <p>9.4. Factor a monomial from a polynomial. (A-SSE.1, A-SSE.1.a, A-SSE.1.b, A-SSE.2)</p> <p>9.5. Factor trinomials in the form $x^2 + bx + c$. (A-SSE.1, A-SSE.1.a, A-SSE.1.b, A-SSE.2)</p> <p>9.6. Factor trinomials in the form $ax^2 + bx + c$. (A-SSE.1, A-SSE.1.a, A-SSE.1.b, A-SSE.2)</p> | <p>Essential Questions: What does it mean to simplify in the language of algebra? How can patterns be used to simplify mathematical expressions?</p> <p>Conceptual Understandings: Many real-world complex problems require simplification to solve. Mathematics is a language of carefully designed terms and symbols.</p> | <p>Pearson Algebra I chapter 8</p> <p>Unit Vocabulary: monomial, binomial, trinomial, polynomial, difference of squares, degree of polynomials</p> <p>Assessment Models: Homework Checkpoints Observation Questioning strategies Quizzes Tests Projects</p> <p>Opportunities for Differentiation: Cooperative group work Assignments and assessments differentiated for ability and/or interest</p> <p>Additional Resources: Textbook Related resources Blackline masters Manipulatives Textbook website Calculators (graphing/scientific)</p> |

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| Suggested days of Instruction | Curriculum Management System | Topic: Polynomials and Factoring | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 9: The student will explore the techniques to add, subtract, multiply and factor polynomials. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>9.7. Factor perfect square trinomials and the difference of two squares. (A-SSE.1, A-SSE.1.a, A-SSE.1.b, A-SSE.2)</p> <p>9.8. Factor higher degree polynomials by grouping. (A-SSE.1, A-SSE.1.a, A-SSE.1.b, A-SSE.2)</p> <p>9.9. Look for and make use of structure. (MP.7)</p> <p>9.10. Look for and express regularity in repeated reasoning. (MP.8)</p> | | |

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| Suggested days of Instruction | Curriculum Management System | Topic: Quadratic Functions and Equations | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 10: The student will explore techniques for representing and solving quadratic functions and equations. Construct, compare, and analyze quadratic functions and apply to real-world situations. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>10.1. Create equations and inequalities in one variable and use to solve problems. (A-CED.1)</p> <p>10.2. Use complete the square method to transform quadratic equation (x) into form $(x-p)^2 = q$ having the same solutions. (A-REI.4.a)</p> <p>10.3. Graph quadratic functions of the form $y = ax^2$, $y = ax^2 + c$, and $y = ax^2 + bx + c$. (F-IF.7, F-IF.7.a)</p> <p>10.4. Solve quadratic equations by graphing and using square roots. (A-REI.4.b)</p> <p>10.5. Solve quadratic equations by factoring. (A-REI.4.b)</p> <p>10.6. Solve quadratic equations by completing the square. (A-REI.4.b)</p> | <p>Essential Questions: Where are curves found in real-world situations? What types of relationships can be modeled by a curved line? What is the language of quadratic models? How can real-life situations be represented by quadratic functions?</p> <p>Conceptual Understandings: Quadratic models allow us to understand the present and communicate predictions about the future. Mathematics is a language of carefully designed terms and symbols. Mathematics is used to make informed decisions about problems in every day life.</p> | <p>Pearson Algebra I chapter 9</p> <p>Unit Vocabulary: discriminant, maximum, minimum, vertex, quadratic equation, quadratic formula, parabola</p> <p>Assessment Models: Homework Checkpoints Observation Questioning strategies Quizzes Tests Projects</p> <p>Opportunities for Differentiation: Cooperative group work Assignments and assessments differentiated for ability and/or interest</p> <p>Additional Resources: Textbook Related resources Blackline masters Manipulatives Textbook website Calculators (graphing/scientific)</p> |

| Suggested days of Instruction | Curriculum Management System | | Topic: Quadratic Functions and Equations | |
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| | <u>Subject/Grade Level:</u> Grade 8 | | <u>Goal 10:</u> The student will explore techniques for representing and solving quadratic functions and equations. Construct, compare, and analyze quadratic functions and apply to real-world situations. | |
| | Mathematics - Algebra | | | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model | |
| | The student will be able to: | | | |
| | <p>10.7. Solve quadratic equations using the quadratic formula. (A-REI.4.b)</p> <p>10.8. Find the number of solutions to a quadratic equation (use discriminant).</p> <p>10.9. Graph polynomial, square root, cube root, step, and absolute functions. (F-IF.7.b, F-IF.7.c)</p> <p>10.10. Factor and complete the square in quadratic functions to show zeros, extreme values and symmetry. (F-IF.8.a)</p> <p>10.11. Identify linear, quadratic and exponential models for data. (F-IF.9)</p> <p>10.12. Look for and make use of structure. (MP.7)</p> | | | |

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| Suggested days of Instruction | Curriculum Management System | Topic: Data Analysis and Probability | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 11: The student will explore techniques for organizing and analyzing data. Apply the concepts of probability to interpret data. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>11.1. Organize data in a matrix. (N-VM.6)</p> <p>11.2. Add and subtract matrices and multiply a matrix by a scalar. (N-VM.7, N-VM.8)</p> <p>11.3. Use statistics appropriate for the shape of the data to compare center and spread for two or more data sets. (S-ID.2)</p> <p>11.4. Interpret differences in shape, center and spread of data sets. (S-ID.3)</p> <p>11.5. Use mean and standard deviation of a data set to fit a normal distribution and to estimate population percentages. (S-ID.4)</p> | <p>Essential Questions: How can collecting and analyzing data help you make decisions or predictions? In what situations can incorrectly presented data be deceiving or even dangerous? What are the different ways that humans deal with chance?</p> <p>Conceptual Understandings: Raw data becomes useful information after analysis and through appropriate presentation. Mathematics is a language of carefully designed terms and symbols. Mathematics is used to make informed decisions about problems in every day life.</p> | <p>Pearson Algebra I chapter 12</p> <p>Unit Vocabulary: combination, event, outcome, outlier, permutation, quartile</p> <p>Assessment Models: Homework Checkpoints Observation Questioning strategies Quizzes Tests Projects</p> <p>Opportunities for Differentiation: Cooperative group work Assignments and assessments differentiated for ability and/or interest</p> <p>Additional Resources: Textbook Related resources Blackline masters Manipulatives Textbook website Calculators (graphing/scientific)</p> |

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| Suggested days of Instruction | Curriculum Management System | Topic: Data Analysis and Probability | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 11: The student will explore techniques for organizing and analyzing data. Apply the concepts of probability to interpret data. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>11.6. Represent data on two quantitative variables on a scatterplot. (S-ID.6, S-ID.6.c) (revised NJSLS)</p> <p>11.7. Assess the fit of a function by plotting and analyzing residuals. (S-ID.6.a, S-ID.6.b) (revised NJSLS)</p> <p>11.8. Find mean, median, mode, and range.</p> <p>11.9. Make and interpret box-and-whisker plots. (S-ID.1)</p> <p>11.10. Find quartiles and percentiles.</p> <p>11.11. Classify data and analyze samples and surveys. (S-CP.1)</p> <p>11.12. Develop a probability distribution for a random variable. (S-MD.3)</p> | | |

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| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | 11.13. Find permutations and combinations. (S-MD.3) 11.14. Find theoretical and experimental probabilities. (7.SP.7.a, 7.SP.7.b) 11.15. Find probabilities of mutually exclusive and overlapping events. (7.SP.7) 11.16. Find probabilities of independent and dependent events. (S-CP.2, S-CP.3) 11.17. Describe events as subsets of a sample space using characteristics of the outcomes. (S-CP.1) 11.18. Look for and express regularity in repeated reasoning. (MP.8) | | |

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| Suggested days of Instruction | Curriculum Management System | Topic: Radical Expressions and Equations | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 12: The student will explore how to simplify radical expressions, solve radical equations and apply these techniques to real-world situations involving the pythagorean theorem. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>12.1. Solve problems using the Pythagorean Theorem. (8.G.7)</p> <p>12.2. A-REI.A.2: Solve equations containing radicals. (A-REI.2)</p> <p>12.3. Simplify radicals to standard radical form.</p> <p>12.4. Simplify radical expressions involving adding/ subtracting, multiplying and dividing.</p> <p>12.5. Model with mathematics. (MP.4)</p> | <p>Essential Questions: How are right triangles used to understand and model our physical world? What does triangulation mean? Why is it necessary to have so many ways of representing a single number?</p> <p>Conceptual Understandings: Mathematics is a language of carefully designed terms and symbols. Mathematics is used to make informed decisions about problems in every day life.</p> | <p>Pearson Algebra I chapter 10</p> <p>Unit Vocabulary: conjugates, hypotenuse, Pythagorean theorem, radical expression</p> <p>Assessment Models: Homework Checkpoints Observation Questioning strategies Quizzes Tests Projects</p> <p>Opportunities for Differentiation: Cooperative group work Assignments and assessments differentiated for ability and/or interest</p> <p>Additional Resources: Textbook Related resources Blackline masters Manipulatives Textbook website Calculators (graphing/scientific)</p> |

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| Suggested days of Instruction | Curriculum Management System | Topic: Radical Expressions and Equations | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 12: The student will explore how to simplify radical expressions, solve radical equations and apply these techniques to real-world situations involving the pythagorean theorem. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
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| Suggested days of Instruction | Curriculum Management System | Topic: Rational Expressions and Equations | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 13: The student will explore operations with rational expressions and how to solve rational equations. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>13.1. Simplify rational expressions.</p> <p>13.2. Multiply and divide rational expressions. (A-APR.7)</p> <p>13.3. Simplify complex fractions. (A-APR.1)</p> <p>13.4. Divide polynomials by a monomial. (A-APR.1)</p> <p>13.5. Add and subtract rational expressions. (A-APR.7)</p> <p>13.6. Solve rational equations and proportions. (A-REI.2)</p> <p>13.7. Make sense of problems and persevere in solving them. (MP.1)</p> | <p>Essential Questions: How do we quantify things that can't be counted? What does it mean to simplify in the language of algebra? How can patterns be used to simplify mathematical expressions?</p> <p>Conceptual Understandings: Mathematics is a language of carefully designed terms and symbols. Many real-world complex problems require simplification to solve.</p> | <p>Pearson Algebra I chapter 11</p> <p>Unit Vocabulary: asymptote, variation, rational expression, rational equation, rational function</p> <p>Assessment Models: Homework Checkpoints Observation Questioning strategies Quizzes Tests Projects</p> <p>Opportunities for Differentiation: Cooperative group work Assignments and assessments differentiated for ability and/or interest</p> <p>Additional Resources: Textbook Related resources Blackline masters Manipulatives Textbook website Calculators (graphing/scientific)</p> |

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| Suggested days of Instruction | Curriculum Management System | Topic: Rational Expressions and Equations | |
| | Subject/Grade Level: Grade 8 Mathematics - Algebra | Goal 13: The student will explore operations with rational expressions and how to solve rational equations. | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | 13.8. Reason abstractly and quantitatively. (MP.2) | | |

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| Suggested days of Instruction | Curriculum Management System Subject/Grade Level: Grade: 8 Mathematics - Algebra (Personal Financial Literacy) | Topic: Credit and Debt Management | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| 14 | <p>14.1. Understand the basics of credit and debt management. (9.2.8.B.10, 9.2.8.C.2)</p> <p>14.2. Identify and understand the benefits, responsibilities, and challenges of credit card use. (9.2.8.C.8, 9.2.8.C.9)</p> <p>14.3. Know that having a credit card is a responsibility and requires you to exercise control. When used responsibly, it is a very valuable and helpful financial tool. (9.2.8.C.6, 9.2.8.C.7, 9.2.8.C.10)</p> <p>14.4. Work collaboratively using technology to perform various tasks associated with credit and debt while developing an understanding of legal and ethical behaviors/responsibilities. (9.2.8.F.2)</p> | <p>Essential Questions: Why is it important to understand your personal finances? What are my responsibilities regarding credit and debt? How can you learn to be more financially successful?</p> <p>Conceptual Understandings: Understanding your finances is essential to prepare for the future.</p> <p>Learning about finances is a personal responsibility with many benefits.</p> | <p>Learning Activities: Lesson 1: Learning about Credit (7 days) Lesson 2: Understanding Credit Card terms (7 days) Glossary of credit terms Class discussions Articles/news stories Current events</p> <p>Assessment Models: Completion of Activity Sheets on each Module (3+4) - see links below Daily Partner Progress response sheet Final presentation (Prezi, PowerPoint, Photostory, advertisement, newsletter, or brochure) Partner progress worksheet</p> <p>Additional Resources: Module resources</p> <p>https://credited.usecreditwisely.com/workshop/mainmenu.php</p> <p>Module 3 - https://credited.usecreditwisely.com/workshop/module3.php</p> |

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| Suggested days of Instruction | Curriculum Management System Subject/Grade Level: Grade: 8 Mathematics - Algebra (Personal Financial Literacy) | Topic: Credit and Debt Management | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>14.5. Justify the concept of “paying yourself first” as a financial savings strategy. (9.2.8.B.2)</p> <p>14.6. Evaluate the relationship of cultural traditions and historical influences on financial practice. (9.2.8.B.5)</p> <p>14.7. Determine the most appropriate use of various financial products and services (e.g., ATM, debit cards, credit cards, checkbooks). (9.2.8.B.10)</p> <p>14.8. Justify safeguarding personal information when using credit cards, banking electronically, or filing forms. (9.2.8.B.11)</p> | | <p>Module 4 - https://credited.usecreditwisely.com/workshop/module4.php</p> |

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| Suggested days of Instruction | Curriculum Management System Subject/Grade Level: Grade: 8 Mathematics - Algebra (Personal Financial Literacy) | Topic: Credit and Debt Management | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>14.9. Evaluate the appropriate financial institutions to assist with meeting various personal financial needs and goals. (9.2.8.B.12)</p> <p>14.10. Compare and contrast the financial products and services offered by different types of financial institutions. (9.2.8.C.1)</p> <p>14.11. Compare and contrast debt and credit management strategies. (9.2.8.C.2)</p> <p>14.12. Demonstrate an understanding of the terminology associated with different types of credit (e.g., credit cards, installment loans, mortgages) and compare the interest rates associated with each. (9.2.8.C.3)</p> | | |

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| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>14.13. Calculate the cost of borrowing various amounts of money using different types of credit (e.g., credit cards, installment loans, mortgages). (9.2.8.C.4)</p> <p>14.14. Determine ways to leverage debt beneficially. (9.2.8.C.5)</p> <p>14.15. Determine potential consequences of using “easy access” credit (e.g., using a line of credit vs. obtaining a loan for a specific purpose). (9.2.8.C.6)</p> <p>14.16. Explain the meaning and possible consequences of “predatory lending practices.” (9.2.8.C.7)</p> | | |

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| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Essential Questions, Conceptual Understandings | Instructional Tools / Materials / Technology / Resources / Learning Activities / Interdisciplinary Activities / Assessment Model |
| | <p>14.17. Explain the purpose of a credit score and credit record, and summarize borrowers' credit report rights. (9.2.8.C.8)</p> <p>14.18. Summarize the causes and consequences of personal bankruptcy. (9.2.8.C.9)</p> <p>14.19. Determine when there is a need to seek credit counseling and appropriate times to utilize it. (9.2.8.C.10)</p> <p>14.20. Analyze interest rates and fees associated with financial services, credit cards, debit cards, and gift cards. (9.2.8.E.2)</p> | | |

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| Suggested days of Instruction | Curriculum Management System Subject/Grade Level: Grade: 8 Mathematics - Algebra (Personal Financial Literacy) | Topic: Credit and Debt Management | |
| | Objectives / Cluster Concepts / Cumulative Progress Indicators (CPI's) The student will be able to: | Goal 14: The student will be able to use technology and Internet resources to learn about credit and debt. The student will develop an understanding of various financial tools, their benefits, and credit and debt responsibilities. | Essential Questions, Conceptual Understandings |
| | <p>14.21. Evaluate the appropriateness of different types of monetary transactions (e.g., electronic transfer, check, certified check, money order, gift card, barter) for various situations. (9.2.8.E.3)</p> <p>14.22. Compare the value of goods or services from different sellers when purchasing large quantities and small quantities. (9.2.8.E.4)</p> <p>14.23. Identify the components of written and verbal contracts and inherent responsibilities of contracting parties. (9.2.8.E.5)</p> <p>14.24. Evaluate the fraudulent activities impact consumers and justify the creation of consumer protection laws. (9.2.8.E.6)</p> | | |

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| | 14.25. Examine the implications of legal and ethical behaviors when making financial decisions. (9.2.8.F.2) 14.26. Compare the impact of losses associated with different types of financial risk. (9.2.8.G.1) | | |