



ESL
SCIENCE
BUSINESS
BILINGUAL
PRESCHOOL
MATHEMATICS
LIBRARY MEDIA
SOCIAL STUDIES
WORLD LANGUAGES
GIFTED & TALENTED
TECHNOLOGY EDUCATION
ENGLISH LANGUAGE ARTS
FINE & PERFORMING ARTS
FAMILY & CONSUMER SCIENCE
HEALTH & PHYSICAL EDUCATION

RAHWAY PUBLIC SCHOOLS

CURRICULUM & INSTRUCTION

Content Area: Mathematics

Course: Algebra/Geometry B

Grade Level: 11 -12

This curriculum is part of the Educational Program of Studies of the Rahway Public Schools.

ACKNOWLEDGMENTS

James Fisher, Program Supervisor of Special Education
Jeffery Kurceski, Program Supervisor of Secondary Mathematics and Science

The Board acknowledges the following who contributed to the preparation of this curriculum.

Steven Santner

Dr. Aleya Shoieb Superintendent

Dr. Tiffany Beer, Director of Curriculum & Instruction

Subject/Course Title:
Algebra/Geometry B
Grade 9 -12

Date of Board Adoptions:
August 27, 2024

RAHWAY PUBLIC SCHOOLS CURRICULUM

Algebra/Geometry B - Grade 10 - 12

Pacing Guide

Unit	Title	Pacing
1	Exponents and Exponential Functions	10 weeks
2	Polynomials and Factoring	10 weeks
3	Quadratic Functions	10 weeks
4	Congruence, Proofs, and Constructions	10 weeks

ACCOMMODATIONS

504 Accommodations:

- Provide scaffolded vocabulary and vocabulary lists.
- Provide extra visual and verbal cues and prompts.
- Provide adapted/alternate/excerpted versions of the text and/or modified supplementary materials.
- Provide links to audio files and utilize video clips.
- Provide graphic organizers and/or checklists.
- Provide modified rubrics.
- Provide a copy of teaching notes, especially any key terms, in advance.
- Allow additional time to complete assignments and/or assessments.
- Provide shorter writing assignments.
- Provide sentence starters.
- Utilize small group instruction.
- Utilize Think-Pair-Share structure.
- Check for understanding frequently.
- Have student restate information.
- Support auditory presentations with visuals.
- Weekly home-school communication tools (notebook, daily log, phone calls or email messages).
- Provide study sheets and teacher outlines prior to assessments.
- Quiet corner or room to calm down and relax when anxious.
- Reduction of distractions.
- Permit answers to be dictated.
- Hands-on activities.
- Use of manipulatives.
- Assign preferential seating.
- No penalty for spelling errors or sloppy handwriting.
- Follow a routine/schedule.
- Provide student with rest breaks.
- Use verbal and visual cues regarding directions and staying on task.
- Assist in maintaining agenda book.

Gifted and Talented Accommodations:

- Differentiate reading levels of texts (e.g., Newsela).
- Offer students additional texts with higher lexile levels.
- Provide more challenging and/or more supplemental readings and/or activities to deepen understanding.
- Allow for independent reading, research, and projects.
- Accelerate or compact the curriculum.
- Offer higher-level thinking questions for deeper analysis.
- Offer more rigorous materials/tasks/prompts.
- Increase number and complexity of sources.
- Assign group research and presentations to teach the class.
- Assign/allow for leadership roles during collaborative work and in other learning activities.

IEP Accommodations:

- Provide scaffolded vocabulary and vocabulary lists.
- Differentiate reading levels of texts (e.g., Newsela).
- Provide adapted/alternate/excerpted versions of the text and/or modified supplementary materials.
- Provide extra visual and verbal cues and prompts.
- Provide links to audio files and utilize video clips.
- Provide graphic organizers and/or checklists.
- Provide modified rubrics.
- Provide a copy of teaching notes, especially any key terms, in advance.
- Provide students with additional information to supplement notes.
- Modify questioning techniques and provide a reduced number of questions or items on tests.
- Allow additional time to complete assignments and/or assessments.
- Provide shorter writing assignments.
- Provide sentence starters.
- Utilize small group instruction.
- Utilize Think-Pair-Share structure.
- Check for understanding frequently.
- Have student restate information.
- Support auditory presentations with visuals.
- Provide study sheets and teacher outlines prior to assessments.
- Use of manipulatives.
- Have students work with partners or in groups for reading, presentations, assignments, and analyses.
- Assign appropriate roles in collaborative work.
- Assign preferential seating.
- Follow a routine/schedule.

ELL Accommodations:

- Provide extended time.
- Assign preferential seating.
- Assign peer buddy who the student can work with.
- Check for understanding frequently.
- Provide language feedback often (such as grammar errors, tenses, subject-verb agreements, etc...).
- Have student repeat directions.
- Make vocabulary words available during classwork and exams.
- Use study guides/checklists to organize information.
- Repeat directions.
- Increase one-on-one conferencing.
- Allow student to listen to an audio version of the text.
- Give directions in small, distinct steps.
- Allow copying from paper/book.
- Give student a copy of the class notes.
- Provide written and oral instructions.
- Differentiate reading levels of texts (e.g., Newsela).
- Shorten assignments.
- Read directions aloud to student.
- Give oral clues or prompts.
- Record or type assignments.
- Adapt worksheets/packets.
- Create alternate assignments.
- Have student enter written assignments in criterion, where they can use the planning maps to help get them started and receive feedback after it is submitted.
- Allow student to resubmit assignments.
- Use small group instruction.

- Simplify language.
- Provide scaffolded vocabulary and vocabulary lists.
- Demonstrate concepts possibly through the use of visuals.
- Use manipulatives.
- Emphasize critical information by highlighting it for the student.
- Use graphic organizers.
- Pre-teach or pre-view vocabulary.
- Provide student with a list of prompts or sentence starters that they can use when completing a written assignment.
- Provide audio versions of the textbooks.
- Highlight textbooks/study guides.
- Use supplementary materials.
- Give assistance in note taking
- Use adapted/modified textbooks.
- Allow use of computer/word processor.
- Allow student to answer orally, give extended time (time-and-a-half).
- Allow tests to be given in a separate location (with the ESL teacher).
- Allow additional time to complete assignments and/or assessments.
- Read question to student to clarify.
- Provide a definition or synonym for words on a test that do not impact the validity of the exam.
- Modify the format of assessments.
- Shorten test length or require only selected test items.
- Create alternative assessments.
- On an exam other than a spelling test, don't take points off for spelling errors.

RAHWAY PUBLIC SCHOOLS CURRICULUM

UNIT OVERVIEW

Content Area: Algebra/Geometry B

Unit Title: Unit one- Exponents and Exponential Functions

Target Course/Grade Level: Algebra/Geometry B grade 10 - 12

Unit Summary:

- Understand and use the laws of exponents to simplify and evaluate expressions
- Graph exponential functions
- Apply exponential functions to real world situations

Approximate Length of Unit: 10 weeks

LEARNING TARGETS

NJ Student Learning Standards:

- 5.NBT.A.2: Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
- 6.EE.A.1: Write and evaluate numerical expressions involving whole-number exponents.
- 8.EE.A: Work with radicals and integer exponents.
- 8.EE.A.1: Know and apply the properties of integer exponents to generate equivalent numerical expressions.
- N.RN.A: Extend the properties of exponents to rational exponents
- N.RN.A.1: Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.
- N.RN.A.2: Rewrite expressions involving radicals and rational exponents using the properties of exponents.
- A.SSE.B.3.c: Use the properties of exponents to transform expressions for exponential functions.
- F.IF.C.7.e: Graph exponential and logarithmic functions, showing intercepts and end behavior.
- F.IF.C.8.b: Use the properties of exponents to interpret expressions for exponential functions.
- F.LE.A: Construct and compare linear and exponential models and solve problems.
- F.LE.A.1: Distinguish between situations that can be modeled with linear functions and with exponential functions.
- F.LE.A.1.a: Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
- F.LE.A.2: Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
- F.LE.A.3: Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.

21st Century Life and Career Skills:

- 9.1.2.FI.1: Differentiate the various forms of money and how they are used (e.g., coins, bills, checks, debit and credit cards).
- 9.1.2.PB.1: Determine various ways to save and places in the local community that help people save and accumulate money over time.
- 9.1.5.CP.1: Identify the advantages of maintaining a positive credit history.
- 9.1.5.FP.3: Analyze how spending choices and decision-making can result in positive or negative consequences.
- 9.1.5.FP.4: Explain the role of spending money and how it affects wellbeing and happiness (e.g., "happy money," experiences over things, donating to causes, anticipation, etc.).

Interdisciplinary Standards:

- RI.MF.5.6. Interpret information presented visually, orally, or quantitatively (e.g., in charts, graphs, diagrams, timelines, animations, or interactive elements on web pages) and explain how the information contributes to an understanding of the text in which it appears.
- 5-ESS1-: Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
- MS-PS3-1: Know and apply the properties of integer exponents to generate equivalent numerical expressions.
- 8.1.2.AP.1: Model daily processes by creating and following algorithms to complete tasks.
- 8.1.2.AP.2: Model the way programs store and manipulate data by using numbers or other symbols to represent information.
- 8.1.8.NI.1: Model how information is broken down into smaller pieces, transmitted as addressed packets through multiple devices over networks and the Internet, and reassembled at the destination.

Unit Understandings:

Students will understand that...

- The laws of exponents can be used to simplify expressions.
- Exponential growth and decay can represent real world problems.
- A comparison can be made between linear and exponential functions.
- Scientific notation can be used to express large and small quantities found in exponential functions.

Unit Essential Questions:

- How do you simplify an expression involving exponents?
- How can we apply exponential functions to real world situations?
- Why/how can we use scientific notation to represent numbers?

Knowledge and Skills:

Students will know.....

- Base, exponent, degree, monomial, coefficient, laws of exponents, product, quotient
- Scientific notation
- Exponential functions, growth, decay
- How to simplify expressions involving exponents
- Scientific notation
- How to graph exponential functions
- How to describe exponential functions

Students will be able to ...

- Simplify expressions involving exponents
- Write numbers in scientific notation
- Understand the need for scientific notation
- Understand exponential functions and how they are used
- Describe if an exponential functions represents growth or decay
- Reason abstractly and quantitatively
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for patterns and express them as exponential functions

<i>EVIDENCE OF LEARNING</i>

Assessment:

What evidence will be collected and deemed acceptable to show that students truly “understand”?

- Unit tests/quizzes
- Open-ended problems that involve written responses
- Daily student work
- Student/group presentations
- Daily Homework

Learning Activities:

What differentiated learning experiences and instruction will enable all students to achieve the desired results?

- Freckle Assignments
- Fundraising activity
- Khan Academy/Mathspace assignments
- Create real world situations in a word problem format and solve each other's problems
- Use real-world literal equations and solve them for a variable different than the one given (science formulas: density, Fahrenheit to Celsius, etc.)

<i>RESOURCES</i>

Teacher Resources:

- Algebra Textbook: Teachers' Edition & accompanying softcover practice workbook
- Teacher developed worksheets
- Teacher developed activities
- Teacher developed presentations and guided notes
- Mathspace, Freckle, and Khan Academy

Equipment Needed:

- Graphing calculators
- Chromebook's
- Paper to show work

RAHWAY PUBLIC SCHOOLS CURRICULUM

UNIT OVERVIEW

Content Area: Algebra/Geometry B

Unit Title: Unit two - Polynomials and Factoring

Target Course/Grade Level: Algebra/ Geometry B /Grade 10 - 12

Unit Summary:

- Perform operations on polynomials.
- Solve problems involving polynomial functions.
- Factor polynomials.

Approximate Length of Unit: 10 weeks

LEARNING TARGETS

- N.CN.c.9: Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.
- A.APR. A.1: Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
- A.APR.B.3: Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
- A.SSE.A.1.a: Interpret parts of an expression, such as terms, factors, and coefficients.
- A.SSE.B.3.a: Factor a quadratic expression to reveal the zeros of the function it defines.
- F.IF.C.7.e: Graph exponential and logarithmic functions, showing intercepts and end behavior.
- F.IF.C.8.b: Use the properties of exponents to interpret expressions for exponential functions.
- F.LE.A.1: Distinguish between situations that can be modeled with linear functions and with exponential functions.
- F.LE.A.1.a: Prove that linear functions grow by equal differences over equal intervals, and that exponential functions grow by equal factors over equal intervals.
- F.LE.A.2: Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
- F.LE.A.3: Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, or (more generally) as a polynomial function.
- F.LE.B.5: Interpret the parameters in a linear or exponential function in terms of a context

21st Century Life and Career Skills:

- 9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors
- 9.1.8.CDM.2: Demonstrate an understanding of the terminology associated with different types of credit (e.g., credit cards, installment loans, mortgages, lines of credit) and compare and calculate the interest rates associated with each.
- 9.1.8.CDM.3: Compare and contrast loan management strategies, including interest charges and total principal repayment costs.
- 9.1.8.CDM.4: Evaluate the application process for different types of loans (e.g., credit card, mortgage, student loans).
- 9.1.8.FI.4: Analyze the interest rates and fees associated with financial products.
- 9.1.12.CDM.6: Compute and assess the accumulating effect of interest paid over time when using a variety of sources of credit. (e.g., student loans, credit cards, auto loans, mortgages, etc.)

Interdisciplinary Standards:

- 5.PS.1.1: Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.
- MS.PS3.1: Know and apply the properties of integer exponents to generate equivalent numerical expressions.

- 4.O.A.A.1: Interpret a multiplication equation as a comparison, e.g., interpret $35 = 5 \times 7$ as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.
- MS-PS1-6: Undertake a design project to construct, test, and modify a device that either relates or absorbs thermal energy by chemical processes.
- 7.EE.B.4: Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.
- 8.F.A.3: Interpret the equation $y = mx + b$ as defining a linear function, whose graph is a straight line, give examples of functions that are not linear.
- 7.EE.B.4: Use variables to represent quantities in a real-world or mathematical problem, and construct multiple equations and inequalities to solve problems by reasoning about the quantities.
- L.KL.9–10.2. Apply knowledge of language to make effective choices for meaning, or style, and to comprehend more fully when reading, writing, speaking or listening.
- RI.AA.9–10.7. Describe and evaluate the argument and specific claims in an informational text, assessing whether the reasoning is valid, and the evidence is relevant and sufficient; identify false statements and reasoning.

Unit Understandings:

Students will understand that...

- Operations can be performed on polynomials.
- Factoring can be used to simplify polynomials.
- Equations can be solved by factoring.

Unit Essential Questions:

- What is a polynomial?
- How can factoring be used to simplify polynomials?
- What are the different ways to factor polynomials and when are they used?
- How can factoring be used to solve equations?

Knowledge and Skills:

Students will know.....

- Polynomial, degree, standard form
- Polynomial functions
- Greatest Common Factor, binomial factor, perfect square trinomial, difference of two squares
- How to perform operations on polynomials
- How to factor polynomials
- How to find the zeros of a function

Students will be able to ...

- Perform operations on polynomials
- Factor polynomials
- Solve equations using factoring
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of patterns in algorithms

EVIDENCE OF LEARNING

Assessment:

What evidence will be collected and deemed acceptable to show that students truly “understand”?

- Unit tests/quizzes
- Open-ended problems that involve written responses
- Daily student work
- Student/group presentations
- Daily Homework

Learning Activities:

What differentiated learning experiences and instruction will enable all students to achieve the desired results?

- Mathematical investigations
- Polynomial manipulatives
- Khan Academy/Mathspace assignments
- Create real world situations in a word problem format and solve each other's problems
- Freckle

<i>RESOURCES</i>

Teacher Resources:

- Algebra Textbook: Teachers' Edition & accompanying softcover practice workbook
- Teacher developed worksheets
- Teacher developed lecture and guided notes
- Teacher developed presentations and guided notes
- Mathspace, Freckle, and Khan Academy

Equipment Needed:

- Graphing calculators
- Chromebook's
- Paper to show work

RAHWAY PUBLIC SCHOOLS CURRICULUM

UNIT OVERVIEW

Content Area: Algebra/ Geometry B

Unit Title: Unit three- Quadratic Functions

Target Course/Grade Level: Algebra/ Geometry B / Grade 10 - 12

Unit Summary:

- Understand and analyze quadratic functions
- Solve problems involving quadratic functions
- Using the quadratic formula to solve quadratic functions
- Complex numbers

Approximate Length of Unit: 10 weeks

LEARNING TARGETS

NJ Student Learning Standards:

- N.CN.C.7: Solve quadratic equations with real coefficients that have complex solutions.
- N.CN.C.9: Know the Fundamental Theorem of Algebra; show that it is true for quadratic polynomials.
- CED.A.1: Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- A.REI.B.4: Solve quadratic equations in one variable.
- A.REI.B.4.b: Solve quadratic equations by inspection taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation.
- A.REI.C.7: Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.
- SSE.B.3.a: Factor a quadratic expression to reveal the zeros of the function it defines.
- SSE.B.3.b: Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
- F.IF.C.7.a: Graph linear and quadratic functions and show intercepts, maxima, and minima.
- F.IF.C.8.a: Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.

21st Century Life and Career Skills:

- 9.1.2.FI.1: Differentiate the various forms of money and how they are used (e.g., coins, bills, checks, debit and credit cards).
- 9.1.2.PB.1: Determine various ways to save and places in the local community that help people save and accumulate money over time.
- 9.1.5.CP.1: Identify the advantages of maintaining a positive credit history.
- 9.1.5.FP.3: Analyze how spending choices and decision-making can result in positive or negative consequences.
- 9.1.5.FP.4: Explain the role of spending money and how it affects wellbeing and happiness (e.g., "happy money," experiences over things, donating to causes, anticipation, etc.).

Interdisciplinary Standards:

- MS-PS2-1: Apply Newton's Third Law to design a solution to a problem involving the motion of two colliding objects.
- MS-PS2-2: Plan an investigation to provide evidence that the change in an object's motion depends on the sum of the forces on the object and the mass of the object.
- MS-PS2-3: Ask questions about data to determine the factors that affect the strength of electric and magnetic forces.
- RST.11-12.1: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- HS-PS3-1: Create a computational model to calculate the change in the energy of one component in a system

when the change in energy of the other component(s) and energy flows in and out of the system are known.

- HS-PS3-3: Design, build, and refine a device that works within given constraints to convert one form of energy into another form of energy.

Unit Understandings:

Students will understand that...

- Quadratic functions form a parabola when graphed.
- Quadratic functions can be solved in a variety of ways.
- Quadratic functions are used to represent real world situations.

Unit Essential Questions:

- What is a quadratic function?
- How can a quadratic function be solved?
- How can you determine the number of real solutions of a quadratic function?
- What is a complex number?

Knowledge and Skills:

Students will know.....

- Quadratic function, parabolas, axis of symmetry, vertex form, minimum value, maximum value, zeros
- Discriminant, imaginary numbers, complex numbers
- Quadratic Formula
- How to graph quadratic functions
- How to solve quadratic functions
- How to find the zeros of a function

Students will be able to ...

- Describe the graph of a quadratic function
- Determine the vertex and axis of symmetry of a quadratic function
- Factor and solve quadratic functions
- Use the quadratic formula
- Use the discriminant to determine the number of real solutions of a quadratic function
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of patterns

<i>EVIDENCE OF LEARNING</i>

Assessment:

What evidence will be collected and deemed acceptable to show that students truly “understand”?

- Unit tests/quizzes
- Open-ended problems that involve written responses
- Daily student work
- Student/group presentations
- Daily Homework

Learning Activities:

What differentiated learning experiences and instruction will enable all students to achieve the desired results?

- Mathspace assignments
- Fundraising activity
- Freckle Assignments
- Create real world situations in a word problem format and solve each other's problems.
- Rescue at 2000 ft. activity

RESOURCES

Teacher Resources:

- Algebra 1 Textbook
- Teacher developed worksheets
- Teacher developed activities
- Teacher developed presentations and guided notes
- Mathspace, Freckle, and Khan Academy

Equipment Needed:

- Graphing calculators
- Graph paper
- Chromebook's

RAHWAY PUBLIC SCHOOLS CURRICULUM

UNIT OVERVIEW

Content Area: Algebra/ Geometry B

Unit Title: Unit four - Congruence, Proofs, and Constructions

Target Course/Grade Level: Algebra/Geometry B/ Grade 10 - 12

Unit Summary:

- Experiment with transformations in the plane.
- Understand congruence in terms of rigid motions.
- Prove geometric theorems.

Approximate Length of Unit: 10 weeks

LEARNING TARGETS

NJ Student Learning Standards:

- 4.G.A: Draw and identify lines and angles, and classify shapes by properties of their lines and angles.
- 4.G.A.1: Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures.
- 8.G.A: Understand congruence and similarity using physical models, transparencies, or geometry software.
- 8.G.A.2: Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.
- G.CO.A.1: Know precise definitions of angle, circle, perpendicular line, parallel line, and line segment, based on the undefined notions of point, line, distance along a line, and distance around a circular arc.
- G.CO.A.3: Given a rectangle, parallelogram, trapezoid, or regular polygon, describe the rotations and reflections that carry it onto itself.
- G.CO.A.4: Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.
- G.CO.A.5: Given a geometric figure and a rotation, reflection, or translation, draw the transformed figure using, e.g., graph paper, tracing paper, or geometry software. Specify a sequence of transformations that will carry a given figure onto another.
- G.CO.B.7: Use the definition of congruence in terms of rigid motions to show that two triangles are congruent if and only if corresponding pairs of sides and corresponding pairs of angles are congruent.

21st Century Life and Career Skills:

- 9.1.5.CR.1: Compare various ways to give back and relate them to your strengths, interests, and other personal factors
- 9.1.8.CDM.2: Demonstrate an understanding of the terminology associated with different types of credit (e.g., credit cards, installment loans, mortgages, lines of credit) and compare and calculate the interest rates associated with each.
- 9.1.8.CDM.3: Compare and contrast loan management strategies, including interest charges and total principal repayment costs.
- 9.1.8.CDM.4: Evaluate the application process for different types of loans (e.g., credit card, mortgage, student loans).
- 9.1.8.FI.4: Analyze the interest rates and fees associated with financial products.
- 9.1.12.CDM.6: Compute and assess the accumulating effect of interest paid over time when using a variety of sources of credit. (e.g., student loans, credit cards, auto loans, mortgages, etc.)

Interdisciplinary Standards:

- RST.6-8.9: Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.
- MS-ESS1-2: Develop and use a model to describe the role of gravity in the motions within galaxies and the solar system.
- MS-ESS1-3: Analyze and interpret data to determine scale properties of objects in the solar system.
- MS-ESS1-4: Construct a scientific explanation based on evidence from rock strata for how the geologic time scale is used to organize Earth's 4.6-billion-year-old history.
- MS-ESS3-1: Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
- MS-ESS3-5: Ask questions to clarify evidence of the factors that have caused climate change over the past century.

- MS-ETS1-1: Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.

Unit Understandings:

Students will understand that...

- Geometric properties can be used to construct geometric figures.
- Geometric relationships provide a means to make sense of a variety of phenomena.
- Shape and area can be conserved during mathematical transformations.
- Reasoning and/or proof can be used to verify or refute conjectures or theorems in geometry.

Unit Essential Questions:

- Describe the result of applying each rule to a figure in the coordinate plane:
 - $A(x,y) = (x-6, y+7)$
 - $B(x,y) = (x, y-14)$
 - $C(x,y) = (x+5, y)$
 - $D(x,y) = (x, -y)$
 - $E(x,y) = (-x, y)$
 - $F(x,y) = (-x, -y)$
- Write the transformation that would translate a figure 5 units to the left and 12 units down
- Identify the properties of quadrilaterals and the relationships among the properties

Knowledge and Skills:

Students will know.....

- Point, line, ray, segment, plane, and angle
- Transformation, translation, reflection, axis of symmetry, rotation
- Congruent, congruence, corresponding parts
- Hypothesis, conclusion, conditional, converse, counterexample, bi-conditional, logical chain, proof, theorem
- Conjecture, theorem, postulate, proof, two-column proof, paragraph proof
- Vertical angles, adjacent angles, consecutive angles, complementary, supplementary, linear pair
- Right angle, acute angle, obtuse angle
- Transversal, alternate interior angles, alternate exterior angles, same-side interior angles, corresponding angles
- Parallel, perpendicular, bisect, perpendicular bisector
- Segment Addition and Angle Addition postulates
- Overlapping Segments and Overlapping Angles Theorems
- Linear Pair property
- Vertical Angles Theorem
- Transitive, Reflexive and Symmetric Properties
- Corresponding Angles Postulate and its converse
- Alternate Interior, Alternate Exterior, Same-Side Interior Theorems and their converses
- Triangle Sum Theorem

Students will be able to ...

- Use mathematical vocabulary fluently
- Use appropriate vocabulary to describe rotations and reflections
- Interpret and perform a given sequence of transformations and draw the result
- Accurately use geometric vocabulary to describe a sequence of transformations
- Use rigid motions to map one figure onto another
- Apply geometric properties to prove two figures are congruent
- Recognize why particular combinations of corresponding parts establish congruence and why others do not
- Construct proofs using a variety of methods: Two-column, paragraph, flowchart
- Make sense of problems and persevere in solving them
- Reason abstractly and quantitatively
- Model with mathematics
- Use appropriate tools strategically
- Attend to precision
- Look for and make use of structure

EVIDENCE OF LEARNING

Assessment:

What evidence will be collected and deemed acceptable to show that students truly “understand”?

- Unit tests/quizzes,
- Open-ended problems that involve written responses
- Daily student work
- Student/group presentations
- Daily Homework

Learning Activities:

What differentiated learning experiences and instruction will enable all students to achieve the desired results?

- Mathematical investigations
- Fundraising activity
- Khan Academy/Mathspace assignments
- Create real world situations in a word problem format and solve each other's problems.
- Use real-world literal equations and solve them for a variable different than the one given (science formulas: density, Fahrenheit to Celsius, etc.)

RESOURCES

Teacher Resources:

- Geometry Textbook: Teachers’ Edition & accompanying softcover workbook
- Teacher developed worksheets and activities
- Teacher developed lectures and guided notes
- Literature: Flatland: A Romance of Many Dimensions by E.A.Abbott
- Geometers Sketchpad
- Visual aids (suggestions) e.g. o Dominos for logical chains
- Mathspace, Freckle, and Khan Academy

Equipment Needed:

- Graphing calculators
- Chromebook's
- Rulers/straight edge
- Protractors
- Compasses
- Patty paper
- Graph paper
- Geometers Sketchpad