

Math 8

Grade 8

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Superintendent of Schools:

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Approved by the Midland Park Board of Education on

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Revised August 22, 2022

Content Area: The Number System / Number Sense

Unit Title: Unit 1 - Integers & Algebraic Expressions

Target Course/Grade Level: Grade 8

Unit Summary

This unit will be a review of pre-algebra concepts learned in 7th grade. Students will know and understand properties of Real Numbers. They will know and apply properties of integers, as well as exponential expressions and basic square roots. Students will also build on their knowledge of operations with rational numbers, i.e. fractions, decimals, mixed numbers, and exponents.

Primary interdisciplinary connections:

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite conclusions drawn from the text.

RI.8.8. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

NJSLS Standards

8.EE.A.1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. *For example, $3^2 \times 3 = 3^{-3} = 1/3^3 = 1/27$.*

8.EE.A.2. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that 2 is irrational.

Career Readiness, Life Literacies, and Key Skills Standards

9.1.8.CDM.1 Compare and contrast the use of credit cards and debit cards for specific purchases and the advantages and disadvantages of using each.

9.2.8.CAP.18: Explain how personal behavior, appearance, attitudes, and other choices may impact the job application process.

9.4.8.TL.2 Gather data and digitally represent information to communicate a real-world problem.

9.4.8.CT.2 Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.

Technology Standards

8.1.8.DA.1 Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.1.8.DA.5 Test, analyze, and refine computational models.

8.1.8.AP.1 Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.

Intercultural Statements

LGBTQ and Disabilities, NJSA 18A:35-4.35

Incorporate word problems including members of the LGBTQ community. Example: Keisha went to the grocery store with her dads. Their bill was \$54.67. Keisha’s parents gave the cashier \$60.00. How much change did her dads get back? Write and solve an equation to model this situation.

AAPI Law, NJSA 18A:25-4.44

Read and discuss the article “5 Things to Know About Shakuntala Devi”. Shakuntala Devi is known as “The Human Computer” anshe holds the Guinness World Record for “Fastest Human Computation.” Then discuss the following Discussion Questions: ●

What mathematical skills did Devi excel at?

- Devi once said “Education is not just about going to school and getting a degree. It’s about widening your knowledge and absorbing the truth about life.” Do you agree? Why or why not?
- How did Devi use her platform after becoming famous?
- In school, students are often rewarded for being able to solve math problems quickly. What are the advantages and disadvantages of focusing on speed?

Amistad Law, NJSA 18A:35-4.43

Research Muhammad al-Fullani al-Kishnawi, a 1700 mathematician from Nigeria who founded the magic square. Students will try to solve a magic square and then work to create their own using mathematical skills from this unit. ● **Solve problems by using the four-step plan**

- **Evaluate expressions and identify properties**

Unit Essential Questions

- How does number sense provide the foundation of mathematical reasoning?

- **Compare and order integers and find absolute value**
- **Add, subtract, multiply divide integers**

Unit Enduring Understandings

- Number sense provides an understanding of numbers within a system of numbers, and allows understanding the meaning of operations and how they relate to one another.
- Students will strengthen their computational skills for fluency and strengthen their knowledge of estimation.

Unit Learning Targets

Students will...

- **Write algebraic equations and expressions from verbal sentences and problem situations**
- **Solve one, two, and multiple step equations with integers and rational numbers**

Summative Assessment

Students will successfully and accurately complete a Unit Test upon completion of the instructional unit. This test will be designed to assess the problem solving, algebraic thinking, and critical thinking abilities of each individual student. This assessment targets understanding of all algebraic concepts outlined in the Unit Learning Targets.

Modifications:

● Special Education Students ● At-Risk Students

- Allow errors
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions, and permit drawing, as an explanation
- Accept participation at any level, even one word
- Consult with Case Managers and follow IEP accommodations/modifications

- Provide extended time to complete tasks
- Consult with Guidance Counselors and follow I&RS procedures/action plans
- Consult with classroom teacher(s) for specific behavior interventions
- Provide rewards as necessary

● Gifted and Talented Students

● English Language Learners

- Assign a buddy, same language or English speaking
- Allow errors in speaking
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions
- Accept participation at any level, even one word

- Provide extension activities
- Build on students' intrinsic motivations
- Consult with parents to accommodate students' interests in completing tasks at their level of engagement

Formative Assessments

- Homework
- Quizzes/Unit Test
- Do Now exercises/Free response questions
 - Guided practice
 - Observational analysis

- Participation

Lesson # Time frame (hours/days)

Lesson Name

**Algebraic Expressio
Order of Operation**

Integers & Absolute

Adding, Subtracting, Multiplying and Dividing Integers
Properties of Real Numbers
Solving Linear Equations by addition and subtraction

**Solving Linear Equa
6
by multiplying and
dividing**

1-2 class periods

Solving and Writing

1-2 class periods

Mixed Linear Equat

1

2

2-4 class periods (mostly review)

3

1 class period

4

2-3 class periods

5

2-3 class periods

7 1-2 class periods **Teacher Notes:**

Curriculum Development Resources

Click links below to access additional resources used to design this unit:

Content Area: The Number System / Number Sense

Unit Title: Unit 2 - Rational Numbers

Target Course/Grade Level: Grade 8

Unit Summary

Students will deepen their understanding of the number line and rational numbers. They will develop and use strategies to both estimate and compute operations involving rational numbers. Students will also learn and understand that numbers that are not rational are irrational and have properties of their own. They will also review their knowledge of powers and exponents and apply that knowledge by using Scientific Notation to represent very large or very small numbers.

Primary interdisciplinary connections:

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite conclusions drawn from the text.

RI.8.8. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

NJSLS Standards

8.EE.A.3. Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. *For example, estimate the population of the United States as 3×10^8 and the population of the world as 7×10^9 , and determine that the world population is more than 20 times larger.*

8.EE.A.4. Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology.

Career Readiness, Life Literacies, and Key Skills Standards

9.1.8.FI.4 Analyze the interest rates and fees associated with financial products

9.2.8.CAP.11: Analyze potential career opportunities by considering different types of resources, including occupation databases, and state and national labor market statistics.

9.4.8.TL.2 Gather data and digitally represent information to communicate a real-world problem.

9.4.8.CT.2 Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.

9.4.8.CI.3: Examine challenges that may exist in the adoption of new ideas

Technology Standards

8.1.8.DA.1 Organize and transform data collected using computational tools to make it usable for a specific purpose. 8.1.8.DA.5 Test, analyze, and refine computational models.

8.1.8.AP.1 Design and illustrate algorithms that solve complex problems using flowcharts and/or

pseudocode. **Unit Essential Questions** Unit Enduring Understandings

● If a number is not “rational”, then what is it and how can we find it

on a number line? How important are fractions in the real world? ● Students will strengthen their knowledge of real numbers by focusing on what numbers are rational

and irrational and how to estimate or graph them on a number line.

● Students will strengthen and build upon their computational skills of fractions and see them in real life situations

Unit Learning Targets

Students will...

- Express rational numbers as decimals and decimals as fractions
- Compare and order rational numbers on a number line
- Add, subtract, multiply, and divide rational numbers
- Solve equations using rational numbers
- Use powers and exponents in expressions
- Express numbers in scientific notation and choose units of appropriate size for measurement of very large or very small quantities

Summative Assessment (X days)

✓ Students will successfully and accurately complete a Unit Test upon completion of the instructional unit. This test will be designed to assess the problem solving, algebraic thinking, and critical thinking abilities of each individual student. This

assessment targets understanding of all algebraic concepts outlined in the Unit Learning Targets.

Modifications:

- Special Education Students

- Allow errors
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions, and permit drawing, as an explanation
- Accept participation at any level, even one word
- Consult with Case Managers and follow IEP accommodations/modifications

- English Language Learners

- Assign a buddy, same language or English speaking
- Allow errors in speaking
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions
- Accept participation at any level, even one word

- At-Risk Students

- Provide extended time to complete tasks
- Consult with Guidance Counselors and follow I&RS procedures/action plans
- Consult with classroom teacher(s) for specific behavior interventions
- Provide rewards as necessary

- Gifted and Talented Students

- Provide extension activities
- Build on students' intrinsic motivations
- Consult with parents to accommodate students' interests in completing tasks at their level of engagement

Equipment Needed: Internet, Inter Write boards, Number lines and flashcard games **Teacher Resources:** Current textbook

Formative Assessments

- Homework
 - Quizzes/Unit Test
 - Do Now exercises/Free response questions ●
- Guided **Lesson #** Time frame (hours/days)

**Rational nu
Real Numb
introduction**

**Equivalent F
Rational Nu
Practice**

- Participation

Lesson Nam

**Comparing and Ordering
Rational Numbers**

**Adding and Subtracting
Rational Numbers**

**Multiplying and Dividing
Rational Numbers**

Using formu

3

life problem

rational nu

4

Representin

5

numbers us

exponents

6

Scientific No

1 class period

1-2 class periods 1 class period 1-2

class periods 1-2 class periods 2-3 class

periods

1

2

7 2-3 class periods 8 2 class periods

Teacher Notes:

Curriculum Development Resources

Click links below to access additional resources used to design this unit:

Unit Overview Template

Content Area: Patterns and Algebra

Unit Title: Unit 3 - Equations and Inequalities

Target Course/Grade Level: Grade 8

Unit Summary

Students will review and build upon prior knowledge of equations and solving basic one-step equations. This unit, students will solve two-step equations, simplify expressions by combining like terms or using the Distributive Property, and apply those same procedures when solving and graphing inequalities on a number line.

Primary interdisciplinary connections:

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite conclusions drawn from the text.

RI.8.8. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

21st century themes: Learning and Innovation Skills, Information, Media, and Technology Skills (working in Excel)

Learning Targets

NJSLS Standards

8.EE.C.7. Solve linear equations in one variable.

- Give examples of linear equations in one variable with one solution, infinitely many solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form $x = a$, $a = a$, or $a = b$ results (where a and b are different numbers).
- Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.

8.EE.C.8. Analyze and solve pairs of simultaneous linear equations.

- Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
- Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. *For example, $3x + 2y = 5$ and $3x + 2y = 6$ have no solution because $3x + 2y$ cannot simultaneously be 5 and 6.*
- Solve real-world and mathematical problems leading to two linear equations in two variables. *For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.*

Career Readiness, Life Literacies, and Key Skills Standards

9.1.8.CP.1: Compare prices for the same goods or services.

9.1.8.EG.8: Analyze the impact of currency rates over a period of time and the impact on trade, employment, and

income. 9.1.8.FI.1: Identify the factors to consider when selecting various financial service providers.

9.2.8.CAP.18: Explain how personal behavior, appearance, attitudes, and other choices may impact the job application process.

9.4.8.TL.2 Gather data and digitally represent information to communicate a real-world problem.

9.4.8.CT.2 Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.

Technology Standards

8.1.8.DA.1 Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.1.8.DA.2: Explain the difference between how the computer stores data as bits and how the data is displayed.

8.1.8.DA.5 Test, analyze, and refine computational models.

8.1.8.AP.1 Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode.

Students will...

Unit Enduring Understandings

Unit Essential Questions

- How can we solve real life problems by setting up and solving equation, given an unknown value?
- What are the steps and procedures in solving an equation or inequality?
- When do we have one solution? No solution? Infinite solutions? How do we visually represent infinite solutions?

- Students should understand that setting up and solving linear equations and inequalities to solve real life problems can help build their word problem skills.
- Students will see and understand that they can also graphically represent one solution, no solutions, or infinite solutions on a number line

Unit Learning Targets

- Use the distributive property to simplify algebraic expressions and equations
- Solve one, and two step equations
- Write and solve one and two step equations that represent real life situations
- Write and graph inequalities that represent real life situations
- Solve inequalities

Evidence of Learning

Summative Assessment

- ✓ Students will successfully and accurately complete a Unit Test upon completion of the instructional unit. This test will be designed to assess the problem solving, algebraic thinking, and critical thinking abilities of each individual student. This assessment targets understanding of all algebraic concepts outlined in the Unit Learning Targets.

Modifications:

● Special Education Students

- Allow errors
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions, and permit drawing, as an explanation
- Accept participation at any level, even one word
- Consult with Case Managers and follow IEP accommodations/modifications

● English Language Learners

- Assign a buddy, same language or English speaking
- Allow errors in speaking
- Rephrase questions, directions, and explanations

● At-Risk Students

- Provide extended time to complete tasks
- Consult with Guidance Counselors and follow I&RS procedures/action plans
- Consult with classroom teacher(s) for specific behavior interventions
- Provide rewards as necessary

● Gifted and Talented Students

- Provide extension activities
- Build on students' intrinsic motivations
- Consult with parents to accommodate students' interests in completing tasks at their level of engagement

- Allow extended time to answer questions
- Accept participation at any level, even one word

Equipment Needed: Internet, Inter Write boards, Equation balance, Algebra tiles **Teacher**

Resources: Current textbook

Formative Assessments

- Homework
- Quizzes/Unit test
- Guided Practice

Lesson #

1

2

3

4
5
6
7

Solving and graphing one step inequalities

Lesson Plans

Solving and graphing two and multi-step inequalities Time frame (hours/days)
1 class period

Wrap it up Review 2 class periods

Teacher Notes: 2-3 class periods

Curriculum Development Resources 2 class periods

- Participation 1-2 class periods

Lesson Name

Simplifying Algebraic Expressions 1-2 class periods

Review solving one step equations 1-2 class periods

Solving two step equations Solving multi-step equations

- Do Now exercises/Free response questions

Click links below to access additional resources used to design this unit:

Unit Overview Template

Content Area: The Number System / Number Sense

Unit Title: Unit 4 - Real Numbers and the Coordinate Plane

Target Course/Grade Level: Grade 8

Unit Summary

Students will know and apply properties of square roots and cubed roots and understand where they are represented on a number line. They will learn that if a number is not rational, it is irrational and understand the properties of those numbers. Students will then learn that graphing numbers on a coordinate system will help them visually represent a variety of numbers, and will use the Pythagorean Theorem to practice their knowledge of square roots. They will learn about solving problems involving right triangles and calculate the distance between two points in the coordinate plane using the Distance Formula.

Primary/ interdisciplinary connections:

NJLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite conclusions drawn from the text.

RI.8.8. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

21st century themes: Critical Thinking and Problem Solving, Communication and Collaboration, Life and Career Skills

Learning Targets

NJSLS Standards

- 8.EE.A.2. Use square root and cube root symbols to represent solutions to equations of the form $x^2 = p$ and $x^3 = p$, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that 2 is irrational.
- 8.EE.B.5. Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. *For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.*
- 8.EE.B.6.. Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation $y = mx$ for a line through the origin and the equation $y = mx + b$ for a line intercepting the vertical axis at b .

Career Readiness, Life Literacies, and Key Skills Standards

- 9.1.8.CDM.1 Compare and contrast the use of credit cards and debit cards for specific purchases and the advantages and disadvantages of using each.
- 9.2.8.CAP.18: Explain how personal behavior, appearance, attitudes, and other choices may impact the job application process.
- 9.4.8.TL.2 Gather data and digitally represent information to communicate a real-world problem.
- 9.4.8.CT.2 Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.

Technology Standards

- 8.1.8.DA.1 Organize and transform data collected using computational tools to make it usable for a specific purpose.
- 8.1.8.DA.5 Test, analyze, and refine computational models.
- 8.2.8.NT.3: Examine a system, consider how each part relates to other parts, and redesign it for another purpose.

Intercultural Statements

Amistad Law, NJSA 18A:35-4.43

Students will research Martin Luther King, and his contributions to the U.S. Students will then complete a coordinate plane activity, graphing coordinate points in a four quadrant plane and connecting them to create a picture of Martin Luther King.

● Use Venn diagrams to solve problems

Unit Essential Questions

- How can we graph numbers to help us solve problems and Estimate square roots and cubed roots
- visually represent lines and shapes in the coordinate plane? ● ● Graph rational and irrational numbers on the coordinate grid ●
- How does the coordinate grid integrate algebra and geometry? Find the relationship among the sides of a right triangle ● Use the Pythagorean Theorem to solve problems

Unit Enduring Understandings

Unit Learning Targets

Students will...

- All numbers and graphs can be represented on the coordinate plane. The coordinate grid allows for graphic representation of all

mathematical ideas, and the students will begin to see how function.
points, equations, tables, and graphs all convey the same

- Use roots and the coordinate grid to find the distance between two points on the coordinate plane (Distance Formula)
- Graph points and lines given an equation or a table

Evidence of Learning

Summative Assessment

- ✓ Students will successfully and accurately complete a Unit Test upon completion of the instructional unit. This test will be designed to assess the problem solving, algebraic thinking, and critical thinking abilities of each individual student. This assessment targets understanding of all algebraic concepts outlined in the Unit Learning Targets.

Modifications:

- Special Education Students

- Allow errors
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions, and permit drawing, as an explanation
- Accept participation at any level, even one word
- Consult with Case Managers and follow IEP accommodations/modifications

- English Language Learners

- Assign a buddy, same language or English speaking
- Allow errors in speaking
- Rephrase questions, directions, and explanations

- At-Risk Students

- Provide extended time to complete tasks
- Consult with Guidance Counselors and follow I&RS procedures/action plans
- Consult with classroom teacher(s) for specific behavior interventions
- Provide rewards as necessary

- Gifted and Talented Students

- Provide extension activities
- Build on students' intrinsic motivations
- Consult with parents to accommodate students' interests in completing tasks at their level of engagement

- Allow extended time to answer questions
- Accept participation at any level, even one word

Equipment Needed: Internet, Inter Write boards, Coordinate Grid graphs and paper **Teacher**

Resources: Current textbook

Formative Assessments

- Guide Practice
- Quizzes/Unit Test
- Participation
- Homework

- Do Now exercises/Free response questions

Lesson Plans

Lesson # Time frame (hours/days)

Lesson Name	
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1

Exploring Square Roots

2

and Irrational Numbers

1 class period 1-2 class

3

The Pythagorean Theore

periods 2 class periods

4

Using the Pythagorean

Theorem to Solve Proble

1-2 class periods

5

Graphing Rational &

Irrational numbers in th

3-4 class periods 2 class periods

6

Coordinate Plane

Equations, Tables, and Gr

Using the Distance Form

Teacher Notes:

Curriculum Development Resources

Click links below to access additional resources used to design this unit:

Unit Overview Template
Content Area: Patterns & Functions
Unit Title: Unit 5 - Functions
Target Course/Grade Level: Grade 8

Unit Summary

In this unit, students will further their knowledge of representing equations by graphing them in the coordinate plane. Students will begin to hear and understand the idea of a function and linear relationships (as one element changes, it affects the other directly). Students will understand slope as a rate of change in a linear relationship and understand ways to find the slope. Students will finally see a glimpse of quadratic and other nonlinear functions and their graphs.

Primary interdisciplinary connections:

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

RI.8.8. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

21st century themes: Creativity and Innovation, Critical Thinking & Problem Solving, Technology Skills

Learning Targets

NJSLS Standards

8.F.A.1. Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.¹ 8.F.A.2. Compare properties (e.g. rate of change, intercepts, domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). *For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.*

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. *For example, the function $A = s^2$ giving the area of a square as a function of its side length is not linear because its graph contains the points $(1,1)$, $(2,4)$ and $(3,9)$, which are not on a straight line.*

8.F.B.4. Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

8.F.B.5. Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verbally.

Career Readiness, Life Literacies, and Key Skills Standards

9.1.8.CDM.1 Compare and contrast the use of credit cards and debit cards for specific purchases and the advantages and disadvantages of using each.

9.2.8.CAP.18: Explain how personal behavior, appearance, attitudes, and other choices may impact the job application process.

9.4.8.TL.2 Gather data and digitally represent information to communicate a real-world problem.

9.4.8.CT.2 Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.

Technology Standards

8.1.8.DA.1 Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.1.8.DA.5 Test, analyze, and refine computational models.

8.2.8.NT.3: Examine a system, consider how each part relates to other parts, and redesign it for another purpose.

8.2.8.ED.1: Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer.

Unit Essential Questions

- **What do the two variables in an equation really mean and how does one variable's change affect another? ●**
- What is a rate of change and how does that look graphically and in an equation?**

- Students will start to gain an understanding that as one variable changes, it affects the other variable directly in a linear function. They will use real life situations to represent linear functions and use their graphs to understand

the rate of change.

Unit Learning Targets

Students will...

- Analyze functional relationships to explain how a change in one quantity can result in a change in another using graphs and tables
- Find the slope of a line and analyze how the slope also represents the rate of change
- Relate linear and nonlinear graphs to Events
- Graph linear equations using tables, slope and y-intercepts
- Write rules for linear functions
- Use tables to graph and interpret quadratic and other nonlinear functions

Evidence of Learning

Summative Assessment

- ✓ Students will successfully and accurately complete a Unit Test upon completion of the instructional unit. This test will be designed to assess the problem solving, algebraic thinking, and critical thinking abilities of each individual student. This assessment targets understanding of all algebraic concepts outlined in the Unit Learning Targets.

Modifications:

- Special Education Students
 - Allow errors
 - Rephrase questions, directions, and explanations
 - Allow extended time to answer questions, and permit drawing, as an explanation
 - Accept participation at any level, even one word
 - Consult with Case Managers and follow IEP accommodations/modifications
- At-Risk Students
 - Provide extended time to complete tasks
 - Consult with Guidance Counselors and follow I&RS procedures/action plans
 - Consult with classroom teacher(s) for specific behavior interventions
 - Provide rewards as necessary
- Gifted and Talented Students
 - Provide extension activities



- English Language Learners

- Assign a buddy, same language or English speaking
- Allow errors in speaking
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions
- Accept participation at any level, even one word

- Build on students' intrinsic motivations
- Consult with parents to accommodate students' interests in completing tasks at their level of engagement

Equipment Needed:

Teacher Resources: Current textbook

Formative Assessments

- Quizzes/Unit Test
- Guided Practice
- Homework
- Do Now exercises/Free response questions
- Participation

Lesson Plans

Lesson #	Lesson Name	Time frame (hours/days)
1	Sequences	1-3 days

2	Relating Graphs to	2-3 days
3	Events Functions	2-3 days
4	Understanding Slope	2-3 days
5	Graphing Linear Equations	2-3 days
6	Writing Rules for Linear Functions	3 days
7	Quadratic and other Nonlinear Functions	2-3 days
Teacher Notes:		
Curriculum Development Resources Click links below to access additional resources used to design this unit:		

Content Area: Geometry
Unit Title: Unit 6 - Geometry
Target Course/Grade Level: Grade 8

Unit Summary

In this unit, students will review basic 2D geometry properties. We will look at geometry in the coordinate plane, like transformations, but also review and build on student’s knowledge of 2D geometry involving angles, lines, polygons, and measurements with 2D objects. Students will discover and apply the Pythagorean Theorem as a way of finding missing side lengths of right triangles and apply this formula to real life problems.

Primary interdisciplinary connections:

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; conclusions drawn from the text.

RI.8.8. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

21st century themes: Creativity and Innovation, Critical Thinking & Problem Solving, Technology Skills

NJSLS Standards

8.G.A. 1. Verify experimentally the properties of rotations, reflections, and translations:

- a. Lines are transformed to lines, and line segments to line segments of the same length.
- b. Angles are transformed to angles of the same measure.
- c. Parallel lines are transformed to parallel lines.

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.

8.G.A.3. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

8.G.A.4. Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

8.G.A. 5. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.

8.G.B. 6. Explain a proof of the Pythagorean Theorem and its converse.

8.G.B. 7. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in realworld and mathematical problems in two and three dimensions.

8.G.B.8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system

Career Readiness, Life Literacies, and Key Skills Standards

9.4.8.TL.2 Gather data and digitally represent information to communicate a real-world problem.

9.4.8.CT.2 Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.

Technology Standards

8.1.8.DA.1 Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.1.8.DA.5 Test, analyze, and refine computational models.

8.1.8.AP.2 Create clearly named variables that represent different data types and perform operations on their

values. 8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.

8.2.8.ED.5: Explain the need for optimization in a design process.

Intercultural Statements

AAPL Law, NJSA 18A:25-4.44

Review history of origami and its origination. Discuss the relationship between origami and math, specifically the connection between moving from a two-dimensional figure to a three-dimensional figure. Allow students to research the connection between angles, transformation, or geometric figures and origami. Then have students find and make their own origami figures.

Amistad Law, NJSA 18A:35-4.43

Students research John Urschel, a football player from Penn State who earned a bachelor's and master's degree in mathematics and discuss findings as a class. Watch the YouTube video (https://www.youtube.com/watch?v=G5FNHE_EcRA&t=8s) and discuss the relationship between football and math as discussed in the video.

Students will...

- Students will find that there are many real life applications to

Unit Essential Questions

Unit Enduring Understandings

- How can I use what I know about shapes and figures to apply to two-dimensional objects?
- What are some real life applications for geometry concepts and measurements?

geometry properties and problems. Learning about them and being able to measure will help them solve real world problems

Unit Learning Targets

- Identify special pairs of angles and relationships of angles formed by two parallel lines cut by a transversal ● Use parallel lines to investigate the sum of measures of the angles in triangles and other polygons ● Identify congruent polygons
- Find missing angles (interior and exterior) of triangles & polygons using $(n-2)180$
- Apply Pythagorean Theorem to simple and real world problems
- Locate and name transformations in the Coordinate Plane

Summative Assessment

Students will successfully and accurately complete a Unit Test upon completion of the instructional unit. This test will be designed to assess the problem solving, algebraic thinking, and critical thinking abilities of each individual student. This assessment targets understanding of all algebraic concepts outlined in the Unit Learning Targets

Modifications:

- Special Education Students
- At-Risk Students

○ Allow errors

- Rephrase questions, directions, and explanations
- Allow extended time to answer questions, and permit drawing, as an explanation
- Accept participation at any level, even one word
- Consult with Case Managers and follow IEP accommodations/modifications

● English Language Learners

- Assign a buddy, same language or English speaking
- Allow errors in speaking
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions
- Accept participation at any level, even one word

- Provide extended time to complete tasks
- Consult with Guidance Counselors and follow I&RS procedures/action plans

- Consult with classroom teacher(s) for specific behavior interventions
- Provide rewards as necessary

● Gifted and Talented Students

- Provide extension activities
- Build on students' intrinsic motivations
- Consult with parents to accommodate students' interests in completing tasks at their level of engagement

Equipment Needed: Computers, Inter Write board activities and figures, recipe activity **Teacher**

Resources: Current textbook

Formative Assessments • Math journals

- Unit test
- Guided Practice

7
8

5
6

2	ReflectionsSymmetry
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Lesson #
1

3
4

Content Area: Geometry
Unit Title: Unit 7 -
 Measurement **Target**
Course/Grade Level: Grade 8
Unit Summary

- Group activities
 - ~~Homework~~
 - Participation
- 1 class period review
- 1 class period review
- 1 class period
- Time frame (hours/days)
- 1 class period
- 1 class period
- 1 class period
- 2 class periods
- 1 class period
- 1 class period

Unit Overview Template

In this unit, students will take what they learned in 2D geometry and apply it to 3D geometry properties and measurements. Students will learn about perspective drawings and learn how to draw 3D objects using isometric paper, and well as finding measurements of 3D shapes, including surface area and volume.

Primary interdisciplinary connections:

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite conclusions drawn from the text.

RI.8.8. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

21st century themes: Creativity and Innovation, Critical Thinking & Problem Solving, Technology Skills **Learning**

Targets

NJSLS Standards

- 8.G.A.1. Verify experimentally the properties of rotations, reflections, and translations:
 - a. Lines are transformed to lines, and line segments to line segments of the same length.
 - b. Angles are transformed to angles of the same measure.
 - c. Parallel lines are transformed to parallel lines.
- 8.G.B.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.
- 8.G.B.3. Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.
- 8.G.B.4. Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe

a sequence that exhibits the similarity between them.

8.G.B.5. Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. *For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.*

8.G.B.6. Explain a proof of the Pythagorean Theorem and its converse.

8.G.B.7. Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

8.G.B.8. Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. 8.G.C.9.

Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

Career Readiness, Life Literacies, and Key Skills Standards

9.1.8.CDM.1 Compare and contrast the use of credit cards and debit cards for specific purchases and the advantages and disadvantages of using each.

9.2.8.CAP.18: Explain how personal behavior, appearance, attitudes, and other choices may impact the job application process.

9.4.8.TL.2 Gather data and digitally represent information to communicate a real-world problem.

9.4.8.CT.2 Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.

Technology Standards

8.1.8.DA.1 Organize and transform data collected using computational tools to make it usable for a specific purpose. 8.1.8.DA.5 Test, analyze, and refine computational models.

8.1.8.AP.1 Design and illustrate algorithms that solve complex problems using flowcharts and/or pseudocode. *Students will...*

Unit Essential Questions

- What does it look like and mean to go from 2D to 3D
- Identify and draw 3D figures, using isometric geometry?
- How can I draw or represent 3D objects on a flat, 2D surface?
- How are 3D objects measured? How is this used

paper Unit Enduring Understandings

- Students will find that there are many real life applications to 3D geometry. They will identify and draw 3D objects as well as find their measurements, like surface area and volume.

real life situations? Unit Learning Targets

- Discuss and identify Nets of 3D objects by using an interactive online virtual site
- Find the surface areas of prisms, cylinders, pyramids, and cones
- Find the volume of prism, cylinders, and cones
- Explore properties of spheres

Evidence of Learning

Summative Assessment

Students will successfully and accurately complete a Unit Test upon completion of the instructional unit. This test will be designed to assess the problem solving, algebraic thinking, and critical thinking abilities of each individual student. This assessment targets understanding of all algebraic concepts outlined in the Unit Learning Targets

Modifications:

- Special Education Students
 - Allow errors
 - Rephrase questions, directions, and explanations
 - Allow extended time to answer questions, and permit drawing, as an explanation
 - Accept participation at any level, even one word
 - Consult with Case Managers and follow IEP accommodations/modifications
- At-Risk Students
 - Provide extended time to complete tasks
 - Consult with Guidance Counselors and follow I&RS procedures/action plans
 - Consult with classroom teacher(s) for specific behavior interventions
 - Provide rewards as necessary
- Gifted and Talented Students
 - Provide extension activities
 - Build on students' intrinsic motivations
- English Language Learners

- o Assign a buddy, same language or English speaking
- o Allow errors in speaking
- o Rephrase questions, directions, and explanations
- o Allow extended time to answer questions
- o Accept participation at any level, even one word

- o Consult with parents to accommodate students' interests in completing tasks at their level of engagement

Equipment Needed: Computers, Inter Write board activities and figures, recipe activity **Teacher**

Resources: Current textbooks

Formative Assessments

- Math journals
- Quizzes/Unit test

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7

8

Surface area of pyramids and cones

4	Surface area of prisms and cylinders
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Lesson #	Lesson Name
1	Solids
2	Drawing Views of 3D
3	Nets and 3D figures

Volumes of prisms and cylinders

Volume of pyramids and cones

Spheres

Time frame (hours/days) 1 class period

2-3 class periods

1-2 class periods

2-3 class periods

2-3 class periods

Teacher Notes:

Curriculum Development Resources

- Group activities 2-3 class periods
- Participation 2 class periods
- Homework 1 class period

Lesson Plans

Click links below to access additional resources used to design this unit:

Unit Overview Template

Content Area: Discrete Mathematics

Unit Title: Unit 8 - Analyzing Data and Probability

Target Course/Grade Level: Grade 8

Unit Summary

In this unit, students will look into data and how data is found, represented, and graphed. Students will gather their own data to display in a variety of graphs, calculate important measures of central tendency, and discuss basic probability events and their outcomes. As a connection to linear relationships, students will also discuss the connection between proportional relationships as seen in graphs like Distance-Time graphs.

Primary interdisciplinary connections:

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; support conclusions drawn from the text.

RI.8.8. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

Career Ready Practices:

CRP4: Communicate clearly and effectively and with reason.

CRP8: Utilize critical thinking to make sense of problems and persevere in solving them.

21st century themes: Creativity and Innovation, Critical Thinking & Problem Solving, Technology Skills

Learning Targets

NJSLS Standards

8.SPA.1. Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

8.SPA.2. Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit (e.g. line of best fit) by judging the closeness of the data points to the line.

8.SPA.3. Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the

slope and intercept. *For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.*

8.SPA.4. Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. *For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?*

Career Readiness, Life Literacies, and Key Skills Standards

9.4.8.TL.2 Gather data and digitally represent information to communicate a real-world problem.

9.4.8.CT.2 Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.

Technology Standards

8.1.8.DA.1 Organize and transform data collected using computational tools to make it usable for a specific purpose.

8.1.8.DA.5 Test, analyze, and refine computational models.

8.1.8.AP.2 Create clearly named variables that represent different data types and perform operations on their

values. 8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.

8.2.8.ED.3: Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).

Intercultural Statements

AAPI Law, NJSA 18A:25-4.44

Students will explore the possible causes for the increase of hate crimes between 2000 and 2001 as well as compare the individual groups that were affected by September 11th using their own models. Students will analyze data related to Hate Crime Incidents in California based on bias motivation.—from the Asian American Education Project: Untold Civil Rights Stories

Holocaust Law, NJSA 18A:35-28

Students practice interpreting data. In this Holocaust lesson, students research selected Internet sources and examine charts, maps, and graphs regarding the Jewish populations in and out of Europe. Students respond to questions about the data.

Unit Essential Questions

Unit Learning Targets

- Why are data and statistical information so incredibly important *Students will...*

in our day, and how can I learn how to collect and display d

in a meaningful way?

Enduring Understandings

- Find the measures of variation of a set of data Unit

- How can graphs help me to understand and see data more cle

and effectively?

- Our world is a data-driven world, and students will learn the variety of ways. They will learn about basic probability and how it is used in so many areas of life and how different jobs depend

- Where can calculating probability be useful in real life?

importance of collecting, analyzing, and representing data in a

on it!

- Conduct a survey of their own choosing and choose an appropriate graph in which to display it
- Collect and display data using stem-and-leaf plots, scatterplots, box-and-whisker plots, etc.
- Select an appropriate display for a set of data
- Find the probability of independent and dependent events, and understand the differences between the two
- Discuss and find experimental and theoretical probabilities
- Predict the actions of a larger group by using a sample
- Use and define vertical-edge graphs
- Count outcomes by using a tree diagram or the Fundamental Counting Principle
- Learn how to interpret and make predictions using scatterplot graphs

Evidence of Learning

Summative Assessment

Students will successfully and accurately complete a Unit Test upon completion of the instructional unit. This test will be designed to assess the problem solving, algebraic thinking, and critical thinking abilities of each individual student. This assessment targets understanding of all algebraic concepts outlined in the Unit Learning Targets

Modifications:

- Special Education Students

- Allow errors
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions, and permit drawing, as an explanation
- Accept participation at any level, even one word
- Consult with Case Managers and follow IEP accommodations/modifications

- English Language Learners

- Assign a buddy, same language or English speaking

- At-Risk Students

- Provide extended time to complete tasks
- Consult with Guidance Counselors and follow I&RS procedures/action plans
- Consult with classroom teacher(s) for specific behavior interventions
- Provide rewards as necessary

- Gifted and Talented Students

- Provide extension activities
- Build on students' intrinsic motivations
- Consult with parents to accommodate students' interests in completing tasks at

o Allow errors in speaking

their level of engagement

o Rephrase questions, directions, and explanations

o Allow extended time to answer questions

o Accept participation at any level, even one word

Equipment Needed: Computers, Inter Write board activities and figures, dice, playing cards, interactive graph websites

Teacher Resources: Current textbook

Formative Assessments		7	Choosing an appropriate graph
• Math journals			
• Unit test			
		8	Theoretical vs. Experimental Probability
• Survey projects			
Lesson #	Lesson Name		
1	Calculating Measures	9	Making predictions
	Central Tendency	10	Conducting a Survey
2	Venn Diagrams	11	Independent and Dependent Events
3	Reading Graphs Critic	12	Permutations and Combinations
4	Stem-and-Leaf Plots		
5	Box-and-Whisker Plo		
6	Making Predictions from Scatterplots	<ul style="list-style-type: none"> • Group activities • Homework • Participation 	

Lesson Plans

1-2 class periods

Time frame (hours/days) 1 class 1-2 class periods 1 class period
period review

1-2 class periods

1 class period

1 class period 1-2 class periods 2

1 class period

-3 class periods

1-2 class periods

2-3 class periods

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Teacher Notes:

Curriculum Development Resources

Click links below to access additional resources used to design this unit:

Unit Overview Template

Content Area: Algebra

Unit Title: Unit 9 - Polynomials and Properties of Exponents

Target Course/Grade Level: Grade 8

Unit Summary

To prepare students for Algebra I or II, students will begin focusing in on a big algebra concept known as polynomials. Students will review their rules of exponents from earlier in the year, and use them with more complicated expressions. We will learn how to add, subtract, multiply, and divide polynomials of varying difficulties.

Primary interdisciplinary connections:

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite support conclusions drawn from the text.

RI.8.8. Delineate and evaluate the argument and specific claims in a text, assessing whether the reasoning is sound and the evidence is relevant and sufficient; recognize when irrelevant evidence is introduced.

NJSLSA.W4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

21st century themes: Learning and Innovation Skills

Learning Targets

NJSLS Standards

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.2. Know and apply the Remainder Theorem: For a polynomial $p(x)$ and a number a , the remainder on division by $x - a$ is $p(a)$, so $p(a) = 0$ if and only if $(x - a)$ is a factor of $p(x)$.

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.APR.C.4. Prove polynomial identities and use them to describe numerical relationships. *For example, the difference of two squares; the sum and difference of two cubes; the polynomial identity $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples.*

A.APR.C.5. (+) Know and apply the Binomial Theorem for the expansion of $(x + y)^n$ in powers of x

and y for a positive integer n , where x and y are any numbers, with coefficients determined for example by Pascal's Triangle.

Career Readiness, Life Literacies, and Key Skills Standards

9.1.8.CDM.1 Compare and contrast the use of credit cards and debit cards for specific purchases and the advantages and disadvantages of using each.

9.4.8.TL.2 Gather data and digitally represent information to communicate a real-world problem.

9.4.8.CT.2 Develop multiple solutions to a problem and evaluate short- and long-term effects to determine the most plausible option.

Technology Standards

8.1.8.AP.2 Create clearly named variables that represent different data types and perform

operations on their values. 8.2.8.ED.2: Identify the steps in the design process that could be used to solve a problem.

8.2.8.ED.3: Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch).

Intercultural Statements

LGBTQ and Disabilities, NJSA 18A:35-4.35

Review properties of exponents and how to simplify algebraic expressions using the properties of exponents. Students will then complete various problems using the skills. On the left side of the worksheet will be various facts about the LGBTQ+ community, with a multiple choice question. Each answer will have a corresponding numerical value next to it. Students will complete the math problem to find the answer to the multiple choice question. Please see example below. **Example**

Math Question: Simplify, showing all work!

$$-3 \cdot 2 + (6 - 10) \cdot 2 \div 2 \cdot 4 - 3 \cdot 0 + 7$$

Multiple Choice Question:

In which year did "the Supreme Court strike down parts of the Defense of Marriage Act (DOMA) (which defined marriage as a union between man and woman) and declare that the federal government would recognize same-sex marriages as legal"? a) 2001 answer: 30

b) 2008 answer: 47

c) 2013 answer: 29

**Answer is c) 2013 answer: 29

Holocaust Law, NJSA 18A:35-28

Students will research the number of people who died in concentration camps during the war over a period of time. Students will create and interpret various data representations and will create a presentation to the class of their findings. **Unit Learning Targets**

Unit Essential Questions

- What are polynomials and how can I simplify them or use basic rules of exponents to calculate them?

Students will...

Unit Enduring Understandings

- Recall and review rules of exponents by applying them to more complex expressions
- Explore polynomials and their names by categorizing them properly by number of terms and degree
- Simplify

- To prepare students for high school algebra classes, at the end of the year we'll do a small unit on polynomials, to introduce the basic operations of polynomials that they will use again in later years and in much more complex situations.

polynomials by adding and subtracting, combining like terms

- **Multiply and divide polynomials by using distributive property and rules of exponents**

Evidence of Learning

Summative Assessment

Students will successfully and accurately complete a Unit Test upon completion of the instructional unit. This test will be designed to assess the problem solving, algebraic thinking, and critical thinking abilities of each individual student. This assessment targets understanding of all algebraic concepts outlined in the Unit Learning Target

Modifications:

- Special Education Students

- Allow errors
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions, and permit drawing, as an explanation
- Accept participation at any level, even one word
- Consult with Case Managers and follow IEP accommodations/modifications

- English Language Learners

- Assign a buddy, same language or English speaking
- Allow errors in speaking
- Rephrase questions, directions, and explanations
- Allow extended time to answer questions
- Accept participation at any level, even one word

- At-Risk Students

- Provide extended time to complete tasks
- Consult with Guidance Counselors and follow I&RS procedures/action plans
- Consult with classroom teacher(s) for specific behavior interventions
- Provide rewards as necessary

- Gifted and Talented Students

- Provide extension activities
- Build on students' intrinsic motivations
- Consult with parents to accommodate students' interests in completing tasks at their level of engagement

Equipment Needed: Computers, Inter Write board activities

Teacher Resources: Current textbook

Formative Assessments ● **Math journals**

● **Quizzes/ Unit test** ● **Homework**

Lesson #	Lesson
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1 Exploring Polynomials

- Guided practice

2 Adding and Subtracting Polynomials

Time frame (hours/days)

3 Exponents and Multiplication

- Participation

Lesson Plans

4 Multiplying Polynomials

2-3 class periods

5 Exponents and Division

2-3 class periods

6 Wrapping it all up review

2-3 class periods

2 class periods

2-3 class periods

1-2 class periods

- Group activities

Teacher Notes:

Curriculum Development Resources

Click links below to access additional resources used to design this unit: